



Syntax & Semantics WiSe 2022/2023

Lecture 3: Basic Concepts II

03/11/2022, Christian Bentz



Overview

Section 1: Recap of Lecture 2

Section 2: Heads

Determining the Head

Phrase Types

Arguments and Adjuncts

Section 3: Valence

Tesnière's Valence Conception

Interlude: Valence and Predicate Logic

The Passivization Test

Section 4: Grammatical Functions

Subject Criteria

The Cross-Linguistic Perspective

References



Section 1: Recap of Lecture 2



Definition: Constituents

Both the **basic elements/units** of a sentence – often orthographic words – as well as **combinations of those**, i.e. **phrases**, count as constituents.

Most basic constituents:

[Kim] [sees] [a] [big] [tree]

Higher level constituents:

[big[tree]], [a[big[tree]]], etc.

Müller (2019). Grammatical theory, p. 7.

Note: Most of the time when the term *constituent* is used in linguistic articles, it will refer to higher level constituents, rather than single words.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



Constituency

tree
NOUN

big [tree]
ADJ [NOUN]

a [big [tree]]
DET [ADJ [NOUN]]

sees [a [big [tree]]]
VERB [DET [ADJ [NOUN]]]

Kim [sees [a [big [tree]]]]
PROPN [VERB [DET [ADJ [NOUN]]]]

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



Constituency Tests

There is a set of tests for “sequences of words” in order to establish whether these constitute *higher order* constituents.

- ▶ Substitution
- ▶ Pronominalization
- ▶ Question Formation
- ▶ Permutation
- ▶ Fronting
- ▶ Coordination

Note: While Müller (2019, p.7) does not explicitly define the length of such sequences of words as > 1 , it seems clear that this is meant here.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



Universality of Constituency (?)

Thalanyji (? , Pama-Nyungan(?))

- (1) Kupuju-lu **kaparla-nha** yanga-lkin **wartirra-ku-nha**
child-ERG dog-ACC chase-PRES woman-DAT-ACC

“The child chases the woman’s dog.”

“Note how possessive modifiers – coded by a special use of the dative case – additionally pick up the case of the noun they modify, as with the accusative -nha on “dog” and “woman-Dat” [...] It is this **case-tagging**, rather than **grouping of words into constituents**, which forms the basic organizational principle in many Australian languages.”

Evans & Levinson (2009), p. 441.

Note however: We don’t know what the different constituent tests above would say about the constituency of *kaparla-nha wartirra-ku-nha*. This is only possible with a detailed knowledge of how the language is used.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



Definition

Parts of Speech are classes of words that each lexical item is assigned to according to its *morphosyntactic* properties. According to Müller (2019: 18) the basic POS are *Verb, Noun, Adjective, Adverb, Prepositions*.

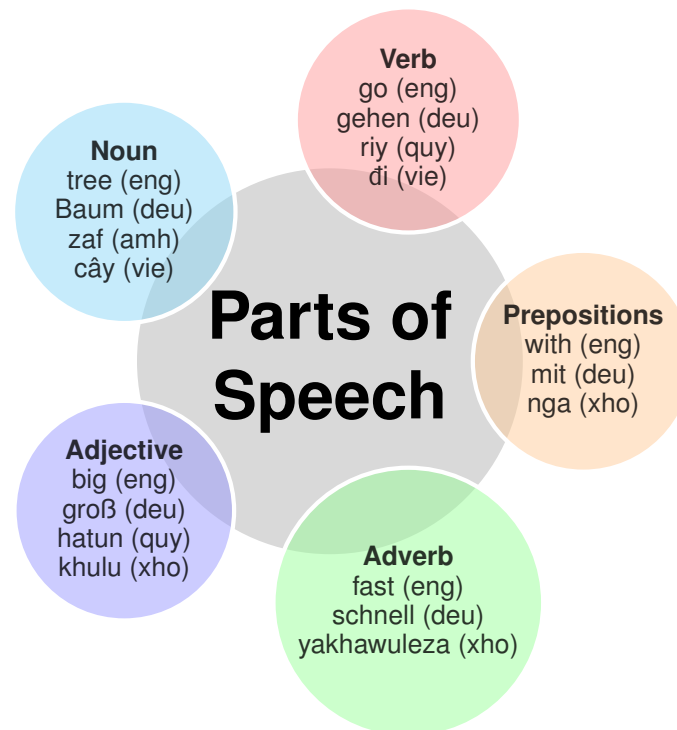
Section 1: Recap of Lecture 2

Section 2: Heads

Section 3: Valence

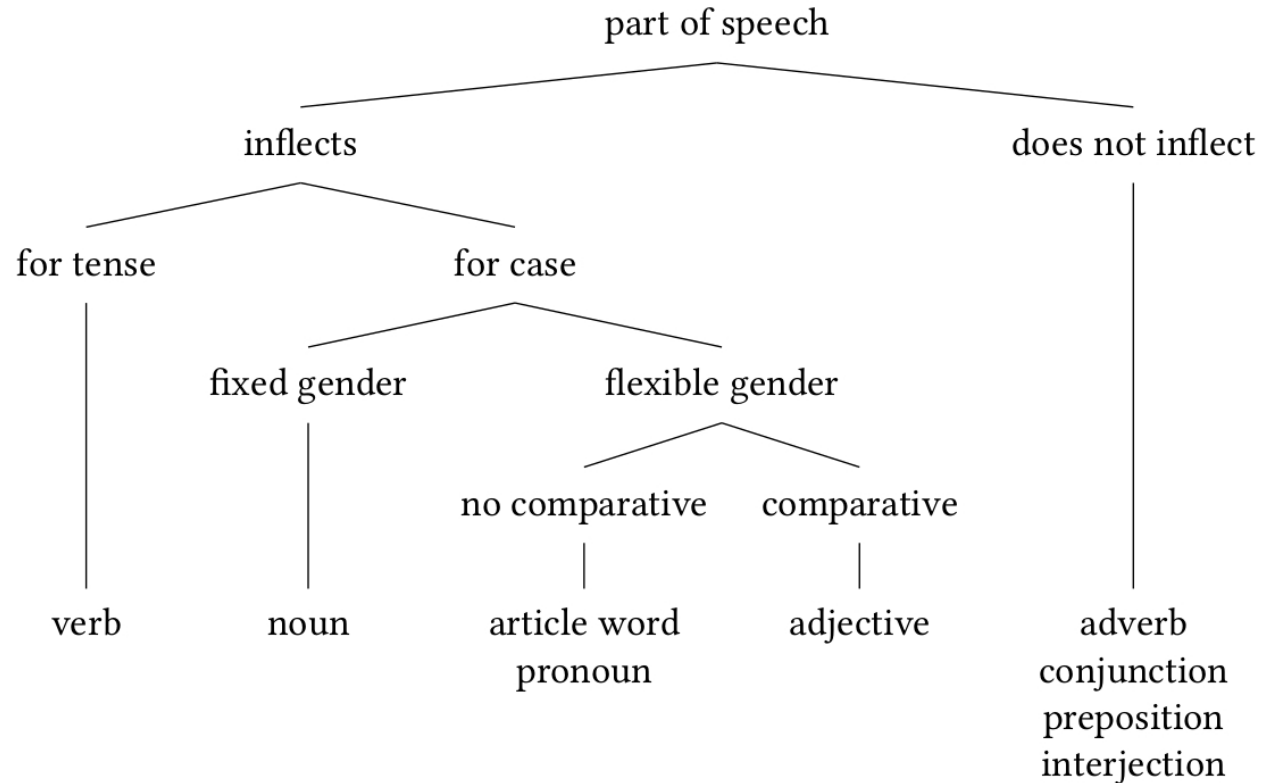
Section 4: Grammatical Functions

References





Decision Tree



Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References

Müller (2019). Grammatical theory, p. 24.

Based on Duden Grammar by Eisenberg et al. (2005).



Summary: Problems with POS

- ▶ **Problem 1:** The number of basic POS can differ according to the framework any particular researcher adheres to (e.g. Interjection, Conjunction, etc. might be seen as additional POS).
- ▶ **Problem 2:** It is controversial whether all languages even have the basic POS mentioned above.
- ▶ **Problem 3:** The abbreviations used for POS can also differ across frameworks.
- ▶ **Problem 4:** Isolating languages have very little or no inflections. According to the Decision Tree all words in these languages would be in the class of adverbs, conjunctions, etc.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



Section 2: Heads



Definition: Head

“The **head** of a constituent/phrase is the element which determines the *most important properties* of the constituent/phrase. At the same time, the head also determines the *composition of the phrase*. That is, the head requires certain other elements to be present in the phrase.”

Müller (2019). Grammatical theory, p. 28.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References

Examples:

- (2) This man **dreams** in his sleep.
- (3) this **man**
- (4) **in** his sleep
- (5) his **sleep**

The heads are here indicated in **bold**.



Determining the Head



Determining the Head

Ayacucho Quechua (quy, Quechuan)

(6) wayna runa mikuy-ta yanu-n
 young man.NOM.SG food-ACC cook-PRS.3SG
 “The young man cooks the food.”

How do we determine which is the head of the overall sentence?

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



Determining the Head

The head of a phrase is the element that provides the “grammatical scaffolding”:

(7) _ _-ta **yanu-n**
 _.NOM.SG _-ACC cook-PRS.3SG
 “_ cooks _.”

Imagine we only hear/read “... yanun”, and the rest of the information of the sentence is lost. We can still determine from this partial information that there has to be a *cooker* and a *cooked*,¹ that the cooker has to be *third person singular*, and that the cooked has to be marked for *accusative case*. In a sense, from *yanun* we can predict the occurrence of *-ta*.

¹I make the assumption here that *yanun* is not used with a single participant like in “he cooks” in English.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



Determining the Head

Why is *wayna runa* “young man” not the head?

- (8) **wayna runa** _-n
 young man.NOM.SG _-PRS.3SG
 “young man _.”

Imagine we only hear/read “*wayra runa ...*”, and the rest of the information of the sentence is lost. We can still determine from this partial information that in order to build a complete and grammatical sentence there has to be a finite verb marked with *-n*. So *wayra runa* predicts *-n*. However, apart from this we don’t know anything about the structure of the sentence. It could be:

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



Examples:

- ▶ ***wayna runa ri-n***
“The young man goes/walks.” (1 participant)
- ▶ ***wayna runa mikuy-ta yanu-n***
“The young man cooks the food.” (2 participants)
- ▶ ***wayna runa warmi-man mikuy-ta apamu-n²***
“The young man brings food to the woman.” (3 participants)
- ▶ etc.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References

²With dative or allative case *-man*.



Determining the Head

Why is *mikuy-ta* “food-ACC” not the head?

- (9) _ **mikuy-ta** _
 _ food-ACC _
 “_ the food.”

Imagine we only hear/read “ ... *mikuy-ta* ...”, and the rest of the information of the sentence is lost. We can still determine from this partial information that in order to build a complete and grammatical sentence there has to be a finite verb³ and another participant. However, apart from this we don’t know much more about the structure of the sentence. It could be:

³Note that in this case *-ta* does not predict *-n*, since there is no number agreement between the case marker and the finite verb in Ayacucho Quechua. The accusative case marker is always *-ta* regardless of number and person.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



Examples:

- ▶ *wayna runa mikuy-ta yanu-n*
“The young man cooks the food.” (2 participants)
- ▶ *wayna runa warmi-man mikuy-ta apamu-n*
“The young man brings food to the woman.” (3 participants)
- ▶ *wayna runa-kuna warmi-man mikuy-ta apamu-nku*
“The young men bring food to the woman.”⁴ (3 participants)
- ▶ etc.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References

⁴-*kuna* is the plural marker on the noun, and *-nku* the third person plural marker on the verb.



Phrase Types



Verb Phrases

Arguably, the occurrence of the finite verb restricts the space of possible sentences more than the occurrence of the individual participant(s) in the scene. If a finite verb occurs, it is generally considered to be the **head** of the phrase. Hence, complete sentences are mostly **verb phrases**.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References

In our example above, the finite verb **yanu-n** “he/she/it cooks” determines:

- ▶ that there have to be **two participants** in the scene: cooker (*wayna runa*), cooked (*mikuy*);
- ▶ that these participants have **particular cases**: NOM, ACC (*-ta*);
- ▶ that the cooker has to be in the singular **number**.



Exception: Copular Clauses

“Copular clauses are a minor sentence type in which the **contentful predicate is not a verb**, but some other category like AP, NP or PP. In some languages there is no verbal element at all in these clauses; in other languages there is a *verbal copula* joining the subject and the non-verbal element.”

Mikkelsen (2011). Copular clauses, p. 1805.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References

Thai (tha, Tai-Kadai)

(10) khāw **pen** nág:rian:
he COP student
“He **is** a student.”

Pitjantjatjara (pjt, Pama-Nyungan)

(11) wait nglayayala
man doctor
“The man **is/was** a doctor.”

Examples from Stassen (2013). Zero copula for predicate nominals.

Note: Thai is like English and other Indo-European languages in that a copular verb is used for predicative constructions, while in Pitjantjatjara there is no copular.



Copular Clauses: Possible Solutions

Some linguists consider the “contentful predicate” as the head of the copular clause, i.e. an adjective, noun. This would then yield an adjective clause or AP. However, in syntactic analyses, you will also sometimes encounter the copula as the head, and hence get VP as the phrase type.⁵

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References

(12) [_{AP}He is very **knowledgeable**]

Example from Universal Dependencies (en_ewt-ud-dev.conllu)

(13) [_{VP}He **is** very knowledgeable]

⁵Note that the distinction between *clause* and *phrase* is not strictly adhered to in different syntactic frameworks.



Noun Phrases: Adjectives and Nouns

Nouns *determine the inflections of adjectives*. For example, in languages where adjectives inflect for gender (e.g. Italian), the noun determines by its biological or grammatical gender also the grammatical gender of the adjective. Hence, it is generally assumed that nouns are the heads of phrases which involve an adjective and a noun, i.e. these are **noun-phrases** (not adjective-phrases).

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References

Amharic (amh, Afro-Asiatic)

(14) addis abäba
new flower

(15) addis bet
new house

Italian (ita, Indo-European)

(16) fiore nuov-**o**
flower.**M** new-**M**.SG

(17) casa nuov-**a**
house.**F** new-**F**.SG

Note: In the Amharic examples, the adjectives do not inflect for gender, while in Italian they do.



Noun Phrases: Determiners and Nouns

The case of determiners and nouns is controversial (see Müller, 2019, p. 29). For example, we could ask, do determiners determine the gender of nouns or the other way around? If the former is the case, then we would consider the examples below as **determiner phrases**, otherwise they would be **noun-phrases**. The answer isn't clear here.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References

Amharic (amh, Afro-Asiatic)

(18) **addis-u** abäba
new-DET flower
“the new flower”

(19) **addis-u** bet
new-DET house
“the new house”

Italian (ita, Indo-European)

(20) **il fiore** nuov-o
DET.**M** flower.**M** new-M.SG
“the new flower”

(21) **la casa** nuov-a
DET.**F** house.**F** new-F.SG
“the new house”



Noun Phrases: Determiners and Nouns

A potential argument for a **DP analysis** (i.e. the determiner as the head of a phrase) is that some determiners (e.g. demonstratives in English) can replace a whole noun phrase. However, this does not work for articles.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References

(22) *These sweets* are very delicious.

(23) *These*⁶ are very delicious.

However:

(24) *The sweets* are very delicious.

(25) *Sweets* are very delicious.

(26) **The* are very delicious.

⁶In this context, *these* might also sometimes be called a *demonstrative pronoun*. This could be considered a subtype of demonstrative, see e.g. <https://glossary.sil.org/term/demonstrative>.



Noun Phrases: Determiners and Nouns

Arguments for an **NP analysis** (i.e. the noun as head of the phrase) are that a) the noun carries (most of) the semantic content (standard predicate logic for instance abstracts away from determiners), b) some languages lack at least some kinds of determiners (e.g. articles).

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References

Ayacucho Quechua (quy, Quechuan)

- (27) *runa* pikchu-man ri-n
man mountain-ALL go-PRS.3SG
“*The man goes to the mountain.*”

Note: If we analyse *the man* as a DP in English, then we would have to analyze *runa* also as DP in Quechua (if we care about cross-linguistic consistency) despite the fact that there is no determiner at all.



Noun Phrases: Determiners and Nouns

We here generally follow Müller (2019, p. 29) in analyzing combinations of nouns and determiners as headed by the noun, i.e. **noun phrases (NPs)**. Keep in mind though that this is controversial. We will see some frameworks (e.g. Government and Binding) where a DP analysis is more common.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



Noun Phrases: Possessor Noun-Phrases

In phrases involving two nouns (sometimes also involving a preposition) that are linked via a **possessor/possessee** relationship (also known as *genitive construction*), the **possessee** is generally assumed to be the *head* of the possessor noun phrase. This is because the *possessee* (rather than the possessor) determines the basic properties of the phrase, whereas the *possessor* is an adjunct, e.g. “the cat’s hat” is a *hat*, not a *cat*; and “the girl’s cat” is a *cat*, not a *girl*.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References

Finnish (fin, Uralic)

(28) tytö-n **kissa**
 girl-GEN cat
 “the girl’s cat”

Dryer (2013). Order of genitive and noun.

Note: Across different languages, possessive marking (by means of an affix) might occur on the dependent noun (e.g. Finnish above), or on the head noun, or not at all.



Adjective Phrases

While phrases involving a noun modified by an adjective are normally considered to be headed by the noun, and hence constitute *noun phrases*, adjectives are sometimes considered to head phrases if the other elements of the phrase depend on them.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References

(29) Karen is [_{AP} very fast]

(30) I figure [_{AP?} that's loud]⁷

(31) I am [_{AP} louder than you are]⁸

(32) I am [_{AP} pretty disillusioned about syntax]

⁷Note that Müller (2019), p. 74 gives “He is proud” as an example of an adjective phrase. This suggests that he considers the adjective to be the head of the phrase rather than the pronoun *he* (or the copula), though it is unclear which morphosyntactic arguments this is based on. Since *that* is a relative pronoun here, and not a complementizer, *loud* is interpreted as the head.

⁸Since this is overall a copular clause, *louder* is not considered an adverb modifying the verb, but an adjective. If the sentence was: “He sings louder than me”, then *louder* would be an Adverb.



Prepositional Phrases: Preposition and Noun(-Phrase)

In some languages (e.g. Polish, German), prepositions determine the case of the noun-phrase they form a constituent with (via so-called lexical case). Hence, phrases involving a preposition are generally considered **prepositional-phrases**.

Section 1: Recap of Lecture 2

Section 2: Heads

Section 3: Valence

Section 4: Grammatical Functions

References

Polish (pol, Indo-European)

(33) miast-**o**
town-NOM.SG

(34) do miast-**a**
to town-GEN.SG
“into town”

(35) przeciw miast-**u**
against town-DAT.SG
“against the town”

(36) z miast-**em**
with town-INS.SG
“with the town”

(37) przy **mieście**
by town.LOC.SG
“by the town”



Overview: Heads and Phrase Types

Example	Head	Phrase Type
she knows the man	knows (V)	VP
he is smart	smart (A), is (V)	AP, VP
smart woman	woman (N)	NP
the woman	woman (N)	NP
the man's cat	cat (N)	NP
very beautiful	beautiful (A)	AP
very quickly	quickly (Adv)	AdvP
in the library	in (P)	PP

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



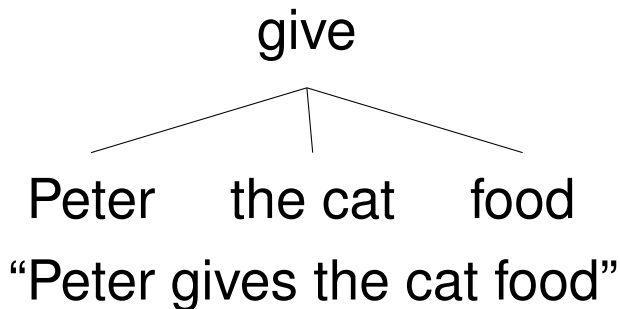
Arguments and Adjuncts



Definition: Projection

“The combination of a head with another constituent is called a **projection of the head**. A projection which contains all the necessary parts to create a well-formed [i.e. grammatically correct] phrase of that type is a **maximal projection**. A sentence is the maximal projection of a finite verb.”

Müller (2019). Grammatical theory, p. 29.



Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



Arguments

The head of a phrase requires certain other elements to be present in order to form a *maximal projection*. These *strictly required* elements are called **arguments** of the head (sometimes also called *dependents* of the head, though the term dependent normally also includes adjuncts).

Müller (2019). Grammatical theory, p. 30-34.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References

(38) _ _-ta **yanu-n**
 _.NOM.SG _-ACC cook-PRS.3SG
 “_ cooks _.”

In our Ayacucho Quechua example from above, the finite verb is the head, and it requires *at least* two further elements in the empty slots of the grammatical “scaffolding” (represented by underscores) in order to become a maximal projection: e.g. *wayna runa* and *mikuy-ta*.



Adjuncts

Beyond the *obligatory* arguments, there are also *optional* elements that might be used to further modify the utterance. These are called **adjuncts**. Typical adjuncts are adjectives, adverbials and prepositional-phrases.⁹

Müller (2019). Grammatical theory, p. 30-34.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References

- (39) (wasi-pi) _ _-ta **yanu-n**
 house-LOC _ .NOM.SG _-ACC cook-PRS.3SG
 “_ cooks _ (in the house).”

For example, *wasi-pi* “in the house” can be added to the sentence to further specify where the cooking happens, but it is not required to form a maximal projection of the head-verb *yanu-n*.

⁹Müller 2019, p.34) points out how in some cases these are also obligatory, e.g. with the German reflexive verb *sich befinden* “to be located”, which requires a prepositional phrase, e.g. *in der Stadt* “in town” to form a grammatical sentence.



Section 4: Valence



Chemical Valency/Valence

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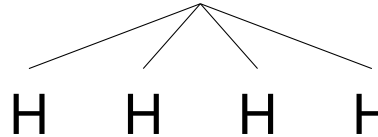
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H

Compound: H_2 (Hydrogen)

Valencies: Hydrogen (1)

C



Compound: CH_4 (Methane)

Valencies: Carbon (4), Hydrogen (1)

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References

“In chemistry, the valence or valency of an element is a measure of its combining power with other atoms when it forms chemical compounds or molecules.”

[https://en.wikipedia.org/wiki/Valence_\(chemistry\)](https://en.wikipedia.org/wiki/Valence_(chemistry))



Valence in Linguistics

“The concept of valence was applied to linguistics by Tesnière (1959): a head needs certain arguments in order to form a stable compound [i.e. a maximal projection]. Words with the same valence – that is which require the same number and type of arguments – are divided into valence classes.”

Müller (2019). Grammatical theory, p. 31.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



Valence according to Tesnière

“Nous avons vu qu’il y avait des verbes sans actant, des verbes à un actant, des verbes à deux actants et des verbes à trois actants.”

Tesnière (1959). *Éléments de syntaxe structurale*, p. 238.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References

	Verb	V	V	V	V
				/ \	/ \
	Arguments	—	A	A A	A A A
Sentence Type:		impersonal sentence	intransitive sentence	transitive sentence	ditransitive sentence
Valency:		avalent (0)	monovalent (1), one-place predicate	bivalent (2), two-place predicate	trivalent (3), three-place predicate



Valence according to Tesnière

“Nous avons vu qu’il y avait des verbes sans actant, des verbes à un actant, des verbes à deux actants et des verbes à trois actants.”

Tesnière (1959). *Éléments de syntaxe structurale*, p. 238.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References

Verb	pleut	dort	frappe	donne
			└─┬─	└─┬─┬─
Arguments	_ (il)	Alfred	Alfred Bernard	Alfred le livre Charles
Example:	<i>il pleut</i> “it rains”	<i>Alfred dort</i> “Alfred sleeps”	<i>Alfred frappe Bernard</i> “Alfred hits Bernard”	<i>Alfred donne le livre à Charles</i> “Alfred gives the book to Charles”

Note: Müller states that the pronouns in expletives (e.g. *it rains*) should be considered obligatory arguments of the verb, while Tesnière explicitly calls them “sans actant”.



Interlude: Valence and Predicate Logic

“The *syntactic arguments* of a head correspond for the most part to their *logical arguments*. We can represent the meaning [...] using predicate logic.”

Müller (2019). Grammatical theory, p. 30.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

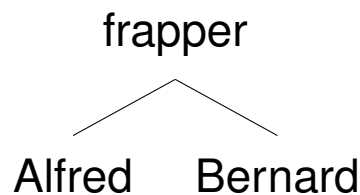
Section 4:
Grammatical
Functions

References

Example:

Alfred frappe Bernard.

Valence tree:



Predicate logic:

frapper'(alfred', bernard')
FRAPPER(a,b)
F(a,b)

Notes: There are different predicate logic notations. The first notation with primes is used by Müller (2019). In Kroeger (2019), the equivalent formulation would be: FRAPPER(a,b). In the semantics part, we will use a short form F(a,b). Also, note that in predicate logic the verb is represented in its infinitive form, not the inflected form. Predicate logic abstracts away from inflectional changes.



Beware: Transitivity (Terminological Confusion)

“The classic division describes all verbs which have an object which becomes the subject *under passivization* as *transitive*. Examples of this are verbs such as *love* or *beat*. *Intransitive* verbs, on the other hand, are verbs which have either *no object*, or one that *does not become the subject* in passive sentences.”

Müller (2019). Grammatical theory, p. 42.

Beware: According to this classic division two-place predicates (requiring two arguments for a maximal projection) are not necessarily considered transitive verbs.
i.e. *two-place* \neq *transitive*

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



Passivization Test

Alfred hits Bernard → **passivization** → *Bernard was hit (by Alfred)*

Conclusion: *hit* requires two arguments, and is a genuinely *transitive* verb.

Alfred weighs seventy kilograms → **passivization** → **Seventy kilograms were weighed (by Alfred)*

Conclusion: *weigh* requires two arguments (**Alfred weighs*), but is not a *transitive* verb according to the passivization test.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



Section 4: Grammatical Functions



Subject and Object

“In some theories, grammatical functions such as **subject** and **object** form part of the formal description of language (see Chapter 7 on Lexical Functional Grammar, for example). [...] it is by no means a trivial matter to arrive at a definition of the word subject which can be used cross-linguistically.”

Müller (2019). Grammatical theory, p. 35.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



Grammatical Functions: Subject

The following syntactic properties defining a subject (in German) are cited by Müller:

- ▶ agreement of the finite verb with it
- ▶ nominative case in non-copular clauses
- ▶ omitted in infinitival clauses
- ▶ optional in imperatives

Müller (2019). Grammatical theory, p. 35.

- (1) **Alice** encounter-**s** weird animals.
- (2) He(NOM) sees him(ACC/OBL). But: He(NOM) is a liar(NOM).
- (3) **She** claims to help John.
- (4) Fürchte dich nicht. (However: *Graue nicht.)
Don't be scared (However: *Don't dread.)

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



Valence and Grammatical Functions

“If we can be clear about what we want to view as a subject, then the definition of *object* is no longer difficult: objects are all other arguments whose form is directly determined by a given head. [...] it is commonplace to talk of *direct objects* and *indirect objects*. The direct object gets its name from the fact that – unlike the indirect object – the referent of a direct object is directly affected by the action denoted by the verb.”

Müller (2019), p. 38.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References

	Verb	V	V	V	V
				/ \	/ \
	Arguments	–	A	A A	A A A
Gramm. Functions:		None or SUBJ	SUBJ	SUBJ, OBJ	SUBJ, DOBJ, IOBJ
Valency:		avalent (0)	monovalent (1)	bivalent (2)	trivalent (3)

Notation: DOBJ (direct object), IOBJ (indirect object)



The Cross-Linguistic Perspective

“The terms *subject* and *object* are used here in a rather informal semantic sense, to denote the more *agent-like* and more *patient-like* elements respectively. Their use here can be defined in terms of the notions S, A, and P, where the S is the single argument in an intransitive clause, the A is the more *agent-like argument* in a transitive clause, and the P is the more *patient-like argument* in a transitive clause. ”

Dryer (2013). Order of subject, object and verb.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

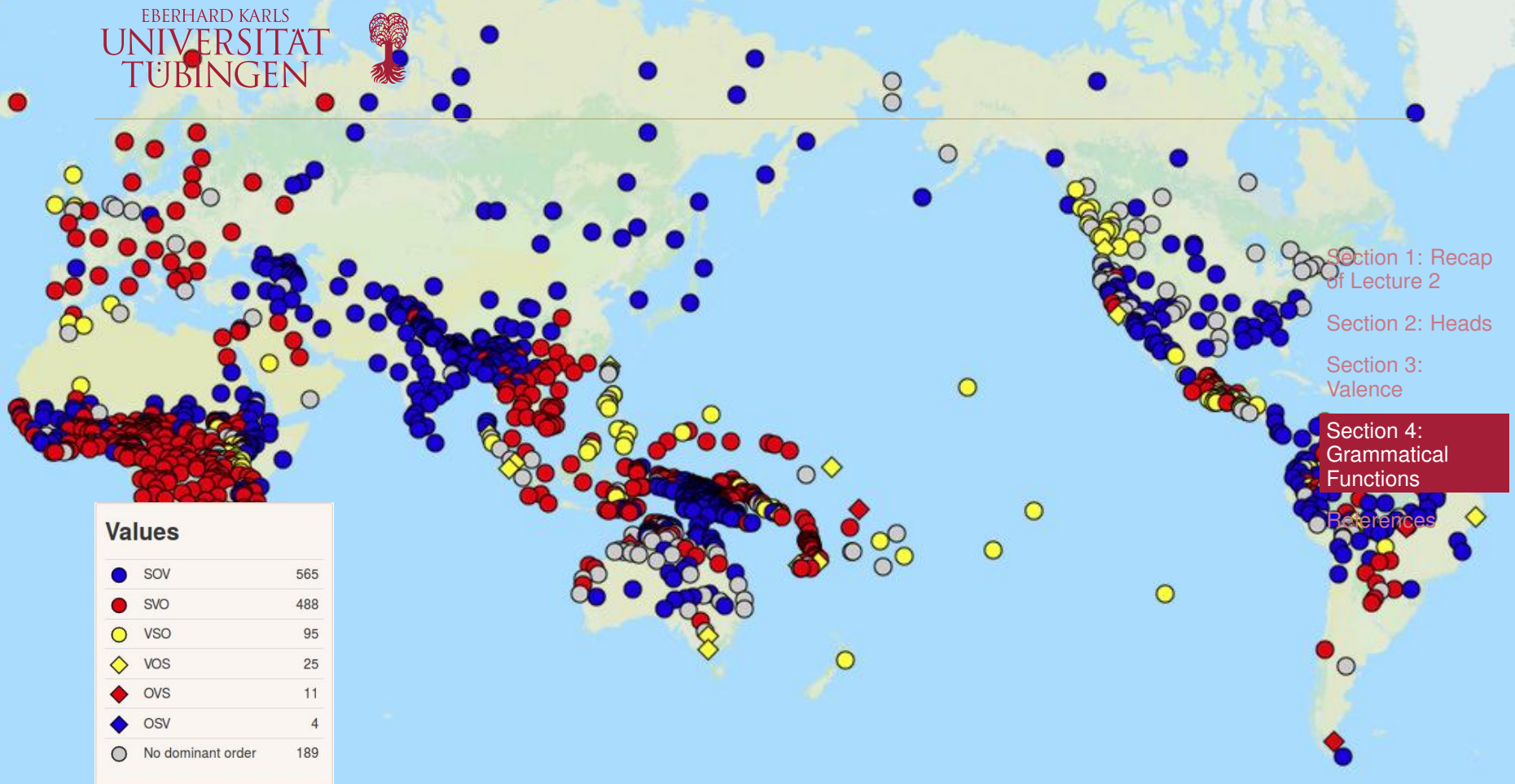
References

Intransitive Example:

(40) Alfred dort.
S V
“Alfred sleeps.”

Transitive Example:

(41) Alfred frappe Bernard.
S(A) V O(P)
“Alfred hits Bernard.”



WALS Chapter 81

Basic order of Subject, Object and Verb for 1377 languages

source: <https://wals.info/chapter/81>



The Six Possible Orders

SOV

(42) Ainu (Isolate: Japan)

kamuy aynu rayke
bear person kill

“The bear killed the person.”

SVO

(43) Matuumbi (Niger-Congo)

abɯnwaásj aachéngjte ñɯ́ɯmba
PN he.built house

“Abumwas built a house.”

Velupillai (2012). An Introduction to Linguistic Typology, p. 285.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



The Six Possible Orders

VSO

(44) Irish (Indo-European)

tógann Máire an cat
lift.PRES PN ART cat

“Mary lifts the cat.”

VOS

(45) Cèmuhî (Austronesian)

ε ālī-hĩ ā-li mwà ɔ pā-li āpūlīp
3SG see-TR ART:NEUT-DEF house SUBJ ART:NF-DEF man

“The man saw the house.”

Velupillai (2012). An Introduction to Linguistic Typology, p. 285.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



The Six Possible Orders

OVS

(46) Hixkaryana (Carib)

toto y-ahosi-ye kamara
man 3:3-grab-distant.pst jaguar
“The jaguar grabbed the man.”

OSV

(47) Warao (Isolate: Venezuela)

erike hube abun-ae
PN snake bite-PAST
“A snake bit Enrique.”

First example: Dryer (2013). Order of subject, object and verb.

Second example: Velupillai (2012). An Introduction to Linguistic Typology, p. 285.

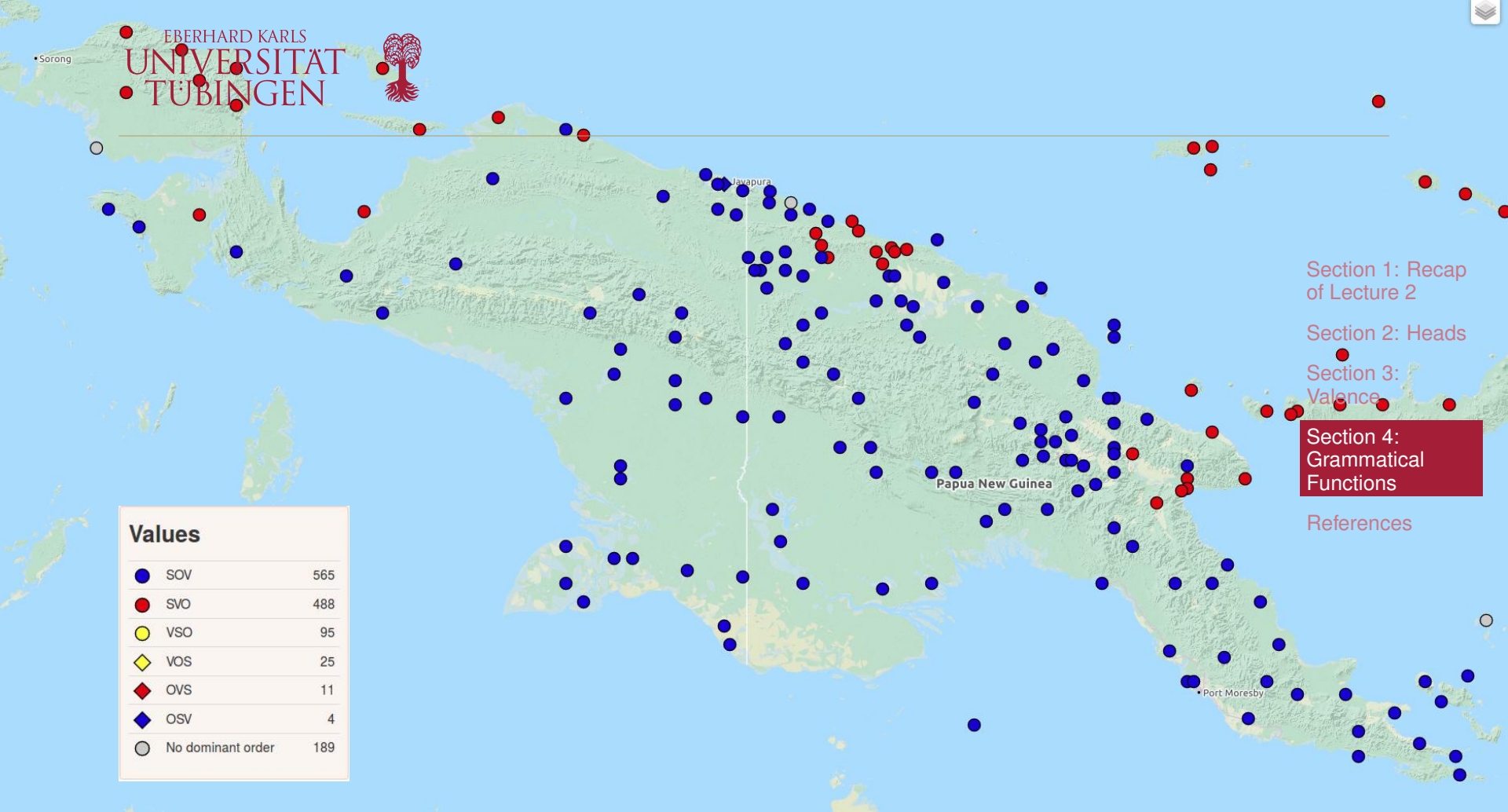
Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

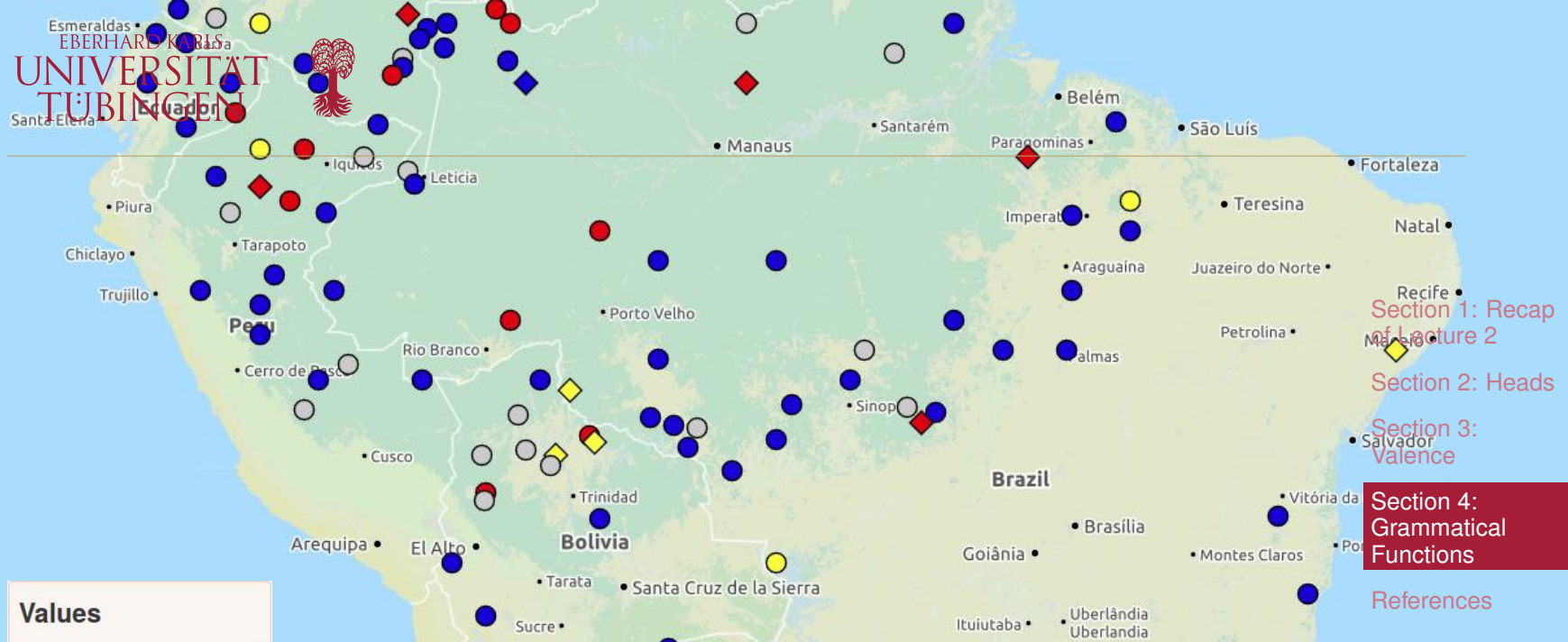
References



WALS Chapter 81

Papua New Guinea

A linguistic puzzle: Why are some areas diverse in languages but homogeneous in word orders? ...



WALS Chapter 81

South America

... While others are diverse in languages *and* word orders?



Summary

- ▶ The **head** of a combination of words is the element determining the scaffolding of the overall syntactic structure.
- ▶ It gives the respective **phrase** its name (NP, VP, AP, etc.)
- ▶ **Arguments** are necessary slots to be filled, **adjuncts** are optional.
- ▶ **Valence** determines the arguments a verb requires to built a grammatical sentence.
- ▶ **Grammatical functions** are typically Subject (Agent), Object (Patient), and Verb across languages of the world.

Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



References



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Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



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Section 1: Recap
of Lecture 2

Section 2: Heads

Section 3:
Valence

Section 4:
Grammatical
Functions

References



Thank You.

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