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She seldom to what?

An investigation into adverbial verbs and
interrogative verbs in verb-initial languages

Victor Bogren Svensson

Supervisors: Arthur Holmer, Marit Julien

Centre for Language and Literature, Lund University
MA in Language and Linguistics, General Linguistics
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Abstract

Adverbial verbs and interrogative verbs are two relatively rare and underexplored linguistic phenomena that are investigated in this typological study. Adverbial verbs are verbal constituents that possess the morphosyntactic properties of verbs but that encode manner and temporal information, instead of referring to states or events as verbs prototypically do. Interrogative verbs possess the morphosyntactic properties of verbs while questioning the very content of the predicate to which they refer.

This typological study examined the properties and distribution of adverbial verbs and interrogative verbs in a language sample consisting of 60 verb-initial languages from 43 genera distributed throughout the world. It furthermore investigated the hypothesis that there is a positive correlation between adverbial verbs and interrogative verbs in verb-initial languages. The hypothesis that they develop via analogy from one another was also examined. Finally, the predictions made by the theoretical explanation of adverbial verbs stating that they are derived from overtly realized heads in functional projections were tested against the language sample employed in this study.

The results of this study found no positive correlation between the presence of adverbial and interrogative verbs in verb-initial languages. A positive correlation between adverbial verbs and interrogative verbs were found in Austronesian languages, suggesting that it is a genetic feature of said language family. Furthermore, no evidence was found suggesting that adverbial verbs develop via analogy from interrogative verbs, or that interrogative verbs develop via analogy from adverbial verbs. Moreover, the theoretical analysis of adverbial verbs as being derived from overtly realized heads in functional projections was corroborated by the results of this study.

This study also showed that adverbial verbs are found throughout the verb-initial languages of the world and that adverbial verbs ought to be recognized as a typologically valid linguistic category. It moreover provided further empirical support for the assertion that interrogative verbs are a genuine linguistic class. Finally, the proposal that languages with adverbial modifiers of manner realized as verbal affixes ought to be classified into the same category of languages with adverbial verbs was proposed and defended in this paper. The claim is based on the assertion that the underlying structure in both cases is the same, where adverbial modifiers of manner realized as verbal affixes are also derived from overtly realized heads in functional projections.

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Note on the Glossing

Unless otherwise stated, the glossings are the same as in the sources, even if it does not follow the Leipzig Glossing Rules. For abbreviations, see appendix 1.

1. Introduction

Adverbial verbs and interrogative verbs are rare and relatively underexplored linguistic phenomena. Their distributions among the languages of the world are poorly understood, making them important objects for typological research. How and why adverbial verbs and interrogative verbs develop are other underexplored issues, in addition to their relation to other linguistic phenomena and linguistic universals. Moreover, their existence raises important theoretical issues related to the concept of verbhood, the structure of adverbs and the derivation of interrogative clauses, all of which are of prime importance for linguistic research. Below follows a brief presentation of adverbial verbs and interrogative verbs, followed by the aims outlined for this study.

Interrogative verbs are a kind of interrogative word that possesses the morphosyntactic features of verbs and questions the very predicate that they themselves express. They are thus distinct from interrogative pronouns and adverbs such as 'what' and 'how', which typically refer to arguments and adjuncts of a verb, respectively. Examples from Seediq (Austronesian: Taiwan) are presented in (1) below. (1a) illustrates how *hwaun/hmuwa*, meaning 'do.what', is the finite verb of the clause, occurring in the initial position with voice morphology. Furthermore, interrogative verbs meaning 'do.what' can often appear as clause-mates to main verbs, in which case they instead fulfill a modifying function towards the main verb, meaning 'do.why' or 'do.how' (Hagege 2008). This is illustrated in (1b). In Seediq, the interrogative verb is the finite verb when it occurs together with a main verb. (1c) contains an example of a main verb occurring as the sole predicate of the clause to illustrate the morphosyntactic similarities between interrogative verbs and main verbs.

1. Seediq

- a) **Hwa-un=su** rodux=su kusun?
do.what-PF=2SG chicken=2SG tomorrow
'What will you do to your chicken tomorrow?'
(Holmer 2012, 907)
- b) **H<m-n>uwa=su** ini usa Taihoku?
<AF-PST>do.what=2SG NEG go.AF.CNG Taipei
'Why didn't you go to Taipei?'
(Holmer 2012, 907)

- c) **M-n-ekan=ku** bunga.
AF-PST-eat=1SGN sweet.potato
 'I ate sweet potato.'
 (Holmer 2012, 906)

Adverbial verbs are verbal constituents that encode temporal and manner information, rather than referring to states or events as verbs characteristically do. Adverbial verbs are verbal in the sense that they display many of the morphosyntactic properties prototypically associated with verbs. An example of an adverbial verb from Seediq is presented in (2) below, where it hosts tense and voice markers as well as a subject clitic. When a main verb appears in the same clause as an adverbial verb, it is not the finite verb of the clause, just like when it appears together with a finite interrogative verb.

2. Seediq

- M<n>hmet-an=mu** beebu ka quyu kiya.
<PST>at.will-LF=1sE beat NOM snake that
 'I recklessly beat that snake.'
 (Holmer 2012, 903)

Since the adverbial verb in (2) hosts tense and voice morphology, one can conclude that it is a head rather than a phrasal unit, following Holmer (2012). Based on Holmer's (2012) theoretical account of adverbial verbs, I assume that adverbial verbs are overtly realized as heads of functional projections situated in the backbone of the clause. This stands in contrast to languages where adverbial modifiers are overtly realized as phrasal units rather than as heads, as in languages where they are realized as manner and temporal adverbs in the surface structure (See Cinque (1999)). The difference between languages with adverbial verbs and languages without is then reduced to whether adverbial modifiers are overtly realized as heads or as phrasal units, respectively (Holmer 2012).

In languages where adverbial modifiers encoding manner are realized as verbal affixes, they must likewise be overtly realized as heads, otherwise they would be unable to be realized as bound morphology. This is the case since maximal projections are assumed to be unable to incorporate and form complex words (Roberts 2010). In languages like Itzaj (Mayan: Guatemala), where adverbial modifiers encoding manner are realized as verbal affixes, these adverbial modifiers must likewise be overtly realized as heads rather than as phrasal units. (3) provides an

example where an adverbial modifier encoding manner (*chich*) is realized as a prefix onto the verb root *meyaj*.

3. Itzaj

Tan-u-**chich**-meyaj.
DUR-3A-**hard**-work
'S/he is working hard.'
(Hofing 2000, 382)

Even though the surface structure differs significantly between languages where adverbial modifiers are adverbial verbs and in languages where they are verbal affixes, the underlying structure is nevertheless assumed to be the same. However, only verbal affixes that encode manner information are included in this study, as those encoding temporal information would be too difficult, if not impossible, to distinguish from aspect markers.

This typological study explores interrogative verbs and adverbial verbs in verb-initial languages. The language sample used in this study consists of 60 verb-initial languages from 43 different genera. Since adverbial verbs and interrogative verbs are relatively unknown and understudied linguistic phenomena, this study is rather exploratory in nature. Nevertheless, hypotheses based on observations from previous research were formulated and tested in this exploratory study. These hypotheses, in addition to the aims of this study, are elaborated upon below.

1.1. Aims and Hypotheses

While adverbial verbs have been extensively studied in Formosan language, i.e. the Austronesian languages spoken on Taiwan (e.g. Chang 2006, Wu 2006, Li 2007, Holmer 2012), they remain unexplored within linguistic typology. The situation for interrogative verbs is similar, where only one typological study has been conducted to date (Hagege 2008). Mapping the distribution and properties of adverbial verbs and interrogative verbs is therefore one of the major aims of this study. This is particularly true for adverbial verbs, since no typological studies on the topic have been conducted to date. Since Taiwan is the most studied area with regards to adverbial and interrogative verbs, it is a natural starting point from which one can conduct a more exploratory study. Beyond mapping the distribution and properties of adverbial verbs

and interrogative verbs in verb-initial languages, some patterns observed based on research on Formosan languages were generalized and extended to be tested against a larger set of verb-initial languages from other areas and language families.

All Formosan languages (with the exception of some Sinicized varieties) are verb-initial, and they all have interrogative verbs and adverbial verbs (Holmer 2012). Based on these observations, it was hypothesized that these properties tend to co-occur. That is, it was proposed that there is a positive correlation between adverbial verbs and interrogative verbs in verb-initial languages. All three are typologically rare features (Hagege 2008, Holmer 2012), yet they are present throughout Formosan languages. The proposal that adverbial verbs are related to a verb-initial constituent order already had support at the onset of this study from empirical data found in other language families as well, where Arabic (Afro-Asiatic: The Middle East, North Africa) and Maasai (Nilo-Saharan: Kenya, Tanzania) constitute two verb-initial languages with adverbial verbs (Holmer 2012).

Furthermore, there are many similarities between the properties of adverbial verbs and interrogative verbs, as is illustrated in 4a and 4b below. Both adverbial verbs and interrogative verbs are the finite verb of a clause when occurring together with a main verb, which in turn is non-finite. Likewise, they both fulfill a modifying function towards the main verb.

4. Seediq

- a) **M<n>hmet-an=mu** beebu ka quyu kiya.
<PST>at.will-LF=1sE beat NOM snake that
 ‘I recklessly beat that snake.’
 (Holmer 2012, 903)
- b) **H<m-n>uwa=su** ini usa Taihoku?
<AF-PST>do.what=2SG NEG go.AF.CNG Taipei
 ‘Why didn’t you go to Taipei?’
 (Holmer 2012, 907)

Based on these structural similarities, the hypothesis was formulated that one develops via analogy from the other. It could then either be the case that adverbial verbs develop via analogy from interrogative verbs functioning as modifiers towards a main verb, or that interrogative verbs develop via analogy from adverbial verbs. If it were the case that adverbial verbs develop via analogy from interrogative verbs, one

would expect to find more languages with only interrogative verbs or with both interrogative verbs and adverbial verbs than languages with only adverbial verbs. If the other direction were the case, then one would expect to find more languages with only adverbial verbs or both adverbial verbs and interrogative verbs than languages with only interrogative verbs. Additionally, they would be expected to be structurally similar, since they develop via analogy. The interrogative verbs that fulfill this kind of modifying function towards the main verb are the ones with the semantic content 'do.what', 'do.why' and 'do.how'. Therefore they are the ones focused upon in this study, as these would be the ones that could develop via analogy from adverbial verbs, or constitute the basis from which adverbial verbs develop via analogy.

An implicational universal tendency related to adverbial verbs has been previously presented by Holmer (2012). Holmer (2012) asserts that there exists a unidirectional correlation between adverbial verbs and verb-initial constituent order, where adverbial verbs are more likely to occur in verb-initial languages. Although Holmer (2012) does not provide any explanation for this suggested universal, he provides a handful of examples of non-Formosan languages with adverbial verbs, which are all verb-initial. Under the stipulation that Holmer's (2012) proposed implicational universal tendency is accurate, structural arguments can be formulated as explanations for this pattern. In verb-initial languages, the finite constituent tends to precede the other primary constituents in the unmarked word order. Consequently, the verbal morphology of the clause ends up on the first primary constituent of the clause. One could then imagine that adverbs that appear in the initial position of a clause could become the host of the verbal morphology of the clause, via analogy of the otherwise initial verb, thus developing into adverbial verbs. This is exactly what happens synchronically in Nuuchahnulth (Wakashan: Canada), thereby providing some empirical support for the aforementioned argument (cf. section 4.1., example 39).

This study makes no explicit attempt to test Holmer's (2012) claim, as it would require the inclusion of non-verb-initial languages in the sample. However, it does aim to expand its empirical basis by mapping the distribution of adverbial verbs in a genetically and geographically diverse sample of verb-initial languages. If it were the case that they are more frequently found in verb-initial languages, one would expect to find several languages with adverbial verbs in a language sample based solely on

verb-initial languages, even though adverbial verbs are typologically rare (Holmer 2012).

Furthermore, the theoretical claim that there are two major categories of languages regarding the phonological realization of adverbial modifiers is explored here. Holmer (2012) maintains that they are overtly realized as heads in some languages (thus enabling them to be realized as adverbial verbs or as verbal affixes), while they are realized as phrasal units in others (in which case they surface as adverbs). By expanding the empirical base upon which this theoretical conjecture is tested, one can explore to what extent different settings of this parameter is found throughout verb-initial languages. The to date only known attestations adverbial verbs in non-verb-initial languages are also examined against the predictions made by Holmer's (2012) conjecture.

Although Hagege (2008) has already conducted an exploratory typologically study on the distribution and properties of interrogative verbs, this study contributes by expanding the empirical base in which interrogative verbs have been examined. Moreover, this study presents and tests additional implicational universals related to interrogative verbs.

To summarize, the primary aim of this typological study is to map the distribution and properties of interrogative verbs and adverbial verbs in verb-initial languages. Secondly, this study attempts to test a previously suggested theoretical explanation for adverbial verbs against a larger and more diverse language sample. Thirdly, I test generalizations based on previous studies (primarily on Formosan languages) on adverbial verbs and interrogative verbs on a larger sample of verb initial languages. These hypotheses are as follows:

- 1) There is a positive correlation between the presence of adverbial verbs and interrogative verbs in verb-initial languages
- 2) Interrogative verbs and adverbial verbs develop via analogy from one another

The second hypothesis does not explicitly state in which direction the development takes place, as at the onset of this study, either order appeared equally possible. This study attempts to test which direction, if any, or even possibly both, is correct.

This study is primarily conducted within the theoretical framework of linguistic typology, while also employing theoretical and methodological tools and assumptions from Principles & Parameters Syntax in order to analyze and understand linguistic patterns and variation.

1.2. Disposition

This paper is structured as follows: In chapter 2, I present previous research first on adverbial verbs, followed by previous research interrogative verbs. Subsequently, the theoretical framework of this study is outlined, starting with more typologically oriented theoretical constructs before moving on to more generatively oriented ones. I finish said section with a theoretical discussion on the underlying structure of adverbial modifiers and interrogative verbs. Chapter 3 contains the methodological framework of this study. I begin by discussing methodological implications of cross-linguistic comparability, followed by a description of the language sample of this study. The definitions of adverbial verbs and interrogative verbs employed in this study are then outlined, in addition to a description of how to find and identify them in grammars and language data. The results of this study are presented in chapter 4, beginning with adverbial verbs before moving on to interrogative verbs. The section containing adverbial verbs also discusses adverbial modifiers as verbal affixes. The subsequent section of this chapter discusses their distribution in relation to each other. The final part of this chapter presents examples of adverbial verbs and interrogative verbs from non-verb-initial languages. Chapter 5 contains a discussion of the findings of this paper and its implications, both for the hypotheses tested here and for linguistic typology in general. Concluding remarks are presented in chapter 6.

2. Background

This chapter is subdivided into two major sections. 2.1. contains an account on previous research on adverbial verbs and previous research into interrogative verbs, while the theoretical framework in which this project was conducted is outlined in 2.2. Regarding the disposition of the theoretical framework, I discuss the theoretical constructs of cross-linguistic comparability and implicational universals in 2.2.1. and 2.2.2., respectively. I then move on to more generative theoretical constructs, discussing the morphology-syntax interface in 2.2.3., the derivation of morphologically complex words in 2.2.4., the status of adverbs in 2.2.5., the derivation of adverbs as affixes in 2.2.6. and finally the underlying structure of interrogative verbs in 2.2.7.

2.1. Previous Research

2.1.1. Previous Research on Adverbial Vverbs

To my knowledge, no previous typological studies have examined adverbial verbs. However, adverbial verbs have been extensively studied in Formosan languages, where adverbial verbs are fairly common. For instance, Chang (2009) writes about adverbial verbs in Tsou (Austronesian: Taiwan) and Wu (2006) writes about them in Paiwan (Austronesian: Taiwan). Li (2007) discusses adverbial verbs in Puyuma (Austronesian: Taiwan) and Chang (2006) adverbial verbs in Kavalan (Austronesian: Taiwan). Holmer (2006, 2010) discusses adverbial verbs in Seediq, in addition drawing parallels to a few other languages with adverbial verbs (Nootka (Nuuchahnulth), Tukang Besi (Austronesian: Sulawesi) and Arabic). Holmer (2012) further discusses adverbial verbs in the four Formosan languages Seediq, Puyuma, Bunun (Austronesian: Taiwan) and Tsou, in an attempt to develop a uniform model for adverbial verbs in Formosan languages.

Chang (2006) states that adverbial modifiers tend to be realized as verbs in Kavalan, in contrast to languages like English (Indo-European) and Malagasy (Austronesian, Madagascar), where they are realized as adverbs. The verbs in question are identified as adverbial modifiers primarily due to their semantic content, as their semantic content overlap with that of adverbs in languages like English (Chang 2006). They are identified as verbal by comparing their morphosyntactic properties to that of verbs in

Kavalan. These properties include being located in the initial predicate slot of a clause, hosting voice morphology, subject clitics as well as tense markers (Chang 2006). Li (2007), discussing Puyuma, employs a similar definition, where the semantic content of adverbial modifiers is compared to the semantic content of adverbs in languages like English and Mandarin (Sino-Tibetan, China). They are likewise identified as verbal by comparing their formal properties to those of verbs in Puyuma (Li 2007). Neither in the study conducted by Chang (2006) nor in the study conducted by Li (2007) are the criteria that form the basis for the identification of adverbial modifiers and verbs explicitly stated.

Parallels to the methodology of Li (2007) and Chang (2006) are found in the work of Holmer (2012) as well. Holmer (2012) discusses adverbial meanings of manner and frequency and also observes that these are realized as verbs in Formosan languages. They are identified as verbs in the languages discussed by comparing their formal properties with that of verbs, while they are identified as adverbial modifiers due to their semantic content.

Even though the definitions that Holmer (2012), Chang (2006) and Li (2007) utilized in their projects are not explicitly defined, the definition used in this study is primarily based upon their works. This is discussed more extensively in chapter 3. The rest of this section is dedicated to proposals regarding the theoretical explanation and derivation of adverbial verbs.

Chang (2006) argues that adverbial verbs take main verbs as complements, and form a complex predicate with them. This complex predicate then jointly licenses the arguments. Chang (2006) argues that the fact that pronominal, focus and aspectual markers can occur on either the temporal adverb and the main verb constitutes support for his analysis. Wu's (2006) discussion on Paiwan largely adheres to the analysis of adverbial verbs as complex predicates formed from the combination of the adverbial verb and the main verb.

Li (2007) instead presents an analysis where adverbial verbs (manner and aspectual adverbial verbs) are interpreted as restructuring verbs, taking a defective TP as complements in Puyuma. The long distance clitic movement in Puyuma (clitics are

attached to the clause initial adverbial verb) is taken as evidence for this analysis (Li 2007).

Discussing Seediq, Holmer (2010, 2012) presents an analysis where adverbial verbs are assumed to be the heads of adverb projections. Under this analysis, adverbial verbs are not actually verbs (in the sense that they are heads of VPs) but adverbs (in the sense that they are the heads of AdvPs). This analysis is based on the assumption that adverbial projections are part of the backbone of the clause, along the lines of the model outlined by Cinque (1999). In languages with adverbial verbs, these adverbs are spelled out as heads, in contrast to languages without adverbial verbs, where the heads of said functional projections are not spelled out and thereby lack phonological realizations. Here adverbs are instead realized as phrasal units in the Spec of their respective projections. Adverbial heads can then be raised to other projections in the clause and merged with other heads (Holmer 2012). For adverbial verbs to be able to be tensed, they must be base generated in a position below the T^0 so that they can move to this position to acquire tense features (Holmer 2012). This is the case for manner and frequency adverbials, which under Cinque's (1999) model would be lower adverbials located below T. Adverbials in Seediq that cannot take tense features, but nonetheless be the host of clitics, are then assumed to be base generated in positions above T^0 (Holmer 2012).

2.1.2. Previous Research on Interrogative Verbs

The only (to my knowledge) typological study of interrogative verbs is Hagege's (2008) paper. It is primarily an explorative study, where the distribution, morphosyntactic properties and semantic content of interrogative verbs are explored. Hagege (2008) claims that they are typologically rare and remain fairly underexplored, in addition to being a relatively unrecognized linguistic category. Below I outline of some Hagege's (2008) conclusions regarding the properties of interrogative verbs, their distribution as well as the definition used by Hagege (2008).

Hagege (2008, 3) defines interrogative verbs as "...a kind of word which both functions as a predicate and questions the semantic content of this predicate". Predicate is used here in the sense of "a function corresponding to a state, process, or action, and representing the syntactic center of the sentence" (Hagege 2008, 3). An

interrogative verb cannot be composed of an interrogative morpheme as well as a verbal morpheme synchronically, according to Hagege (2008).

Hagege (2008) claims that interrogative verbs ought to be distinguished from interrogative words used predicatively. There is an overlap with regards to the features associated with both of these classes, such as being used predicatively and attracting verbal morphology. Hagege (2008) argues that they are distinct by claiming that predicatively used interrogative words are not specialized as interrogative predicates, and that they possess several other uses as well. Predicatively used interrogative words can also be used in nominal-predicative clauses, thus being distinct from interrogative verbs, which only function as verbal predicates (Hagege 2008). True interrogative verbs are dedicated in the sense that they only function as verbal predicates, according to Hagege (2008). Furthermore, Hagege (2008) asserts that interrogative verbs can also be the secondary predicate in serial verbs constructions, in which case they function as adverbial modifiers to the main verbs.

Hagege (2008) concludes that interrogative verbs tend to be present in languages with relatively conservative and complex derivational and/or compositional morphology. Furthermore, he claims that while their distribution is quite diverse (the exception being Europe, which completely lacks interrogative verbs), there is a significant concentration of languages with interrogative verbs in the southwestern Pacific.

Lin (2012) conducted a descriptive study of interrogative verbs in Kavalan and Amis (Austronesian: Taiwan), outlining their formal and semantic properties. The definition of interrogative verbs used in Lin's (2012) study is based upon the work of Hagege (2008). However, Lin (2012) diverges somewhat from Hagege, and lists *tanian* (meaning 'where' and 'put.where') as an interrogative verb, even though it functions both as a verbal predicate and as an adverbial interrogative. This does not conform to Hagege's requirement that interrogative verbs are dedicated and thereby only function as verbal predicates. In (5a), *tanian* is used as an adverbial interrogative, and in (5b) as a verbal interrogative, taking voice and agreement markers. Lin (2012) likewise gives Maori (Austronesian: New Zealand) as an example of a language with an interrogative verb, even though it does not fulfill the requirement of being dedicated (see example (23) below for further details).

are but a few examples of the formal grammarians investigating and attempting to explain linguistic variations with generative grammar as their theoretical framework.

There are benefits of combining more formal elements of linguistic research from frameworks like Principles & Parameters Syntax with linguistic typology. The latter provides important methodological tools related to language sampling and comparing language structure from different languages, while the former assists in the formulation of generalizations and in providing explanatory adequacy to linguistic descriptions. By formulating universal principles and variations in parameters, formal syntax can provide internal explanations for linguistic variation and for limitations on said variation. However, a disadvantage with being overly reliant upon internal explanations is that they are often theory internal and could therefore be regarded as irrelevant by researchers outside the relevant paradigm. Nonetheless, theory internal explanations could still be regarded as pertinent if they are rooted in descriptively accurate accounts and have a solid empirical foundation. Julien's (2002) report on the relative order of verbs, tense markers and aspect markers, Cinque's (1999) account on the placement of sentence adverbs and Baker's (1985, 1988) description of the order of verbal affixes are relevant examples of this. They do not only show strong conformity in linguistic variation, but also provide internal explanations for the observed patterns. One can then choose to temporarily assume that the observed patterns are explained by these theoretical conjectures and explore them to their logical conclusions to test their validity. Or one could simply regard the observed cross-linguistic patterns as the result of chance without providing internal explanations. In this paper, I assume the former position, seeing the benefits brought to linguistic typology with the internal explanations formal grammar provides as well as the advantages with using the larger languages samples of linguistic typology to test internal explanations and the predictions they make.

In the following subsections, I elaborate on some of the theoretical constructs and assumptions used in this study. I begin with some of the more typologically oriented theoretical constructs and assumptions, before moving on towards the more generative ones. I then provide a description of the theoretical account of adverbial verbs and interrogative verbs employed in this study.

2.2.1. Cross-linguistic Comparability

An important theoretical assumption (and methodological issue) within linguistic typology is cross-linguistic comparability (Daniel 2011). Since languages vary considerably in how (form) they refer to something (substance), it begs the question whether or not languages can be compared (Daniel 2011). It is a theoretical assumption that such cross-linguistic comparisons are possible, otherwise the whole typological enterprise would collapse. This is also an assumption made here. However, this leads on to a methodological issue, namely how languages can be accurately and correctly compared, despite radical differences in structure. The more methodological aspects of this issue are discussed in chapter 3.

2.2.2. Implicational Universals

Another important theoretical construct within linguistic typology is that of universals. Of primary importance for this paper is that of implicational universals, since they constitute the kind of universals proposed and subsequently tested in this paper. Implicational universals can be understood as existing along a continuum from absolute ones, through intermediate states where they simply mean a statistically significant correlation, towards the other end of the spectra, where there is no (or no statistically significant) correlation between the two parameters (Daniel 2011). Implicational universals are also called restricted universals (Moravcsik 2011). As mentioned above, these can be both absolute and probabilistic. Regardless, in both absolute and probabilistic restricted universals, a requirement first has to be fulfilled before the implication is valid (Moravcsik 2011). Moravcsik (2011) elaborates on the function of universals, claiming that they both function as explanations for language structure, as well as explananda themselves. In the former case, the structure of a given language is explained by reference to some linguistic universal. In the latter case, the universal itself is explained with reference to some other principles, such as historical factors, structural constraints as well as functional principles such as iconicity and economy (Moravcsik 2011).

2.2.3. The Morphology-Syntax interface

A major point of contention regarding the morphology-syntax interface is the division of labour between the lexicon and morphological processes on the one hand, and syntactic processes on the other (Siddiqi 2014). This is related to different positions as

to what is fed into the syntax, it being words, morphemes or any complex structure with unpredictable meaning (i.e. idiom chunks). Siddiqi (2014) points out that there are two major positions with regards to these issues, namely Lexicalism and Anti-Lexicalism. They do not constitute two homogenous groups, but are cover terms for a wide range of frameworks discussing the morphology-syntax interface. According to Lexicalism, morphologically complex words are either stored in a mental lexicon or produced in a separate morphological module (Siddiqi 2014). They are subsequently sent to the syntax where they constitute the atoms upon which syntactic processes operate. Conversely, according to Anti-Lexicalism syntactic processes do not operate on words as their atoms, but on morphemes or sub-morphemic units, and morphologically complex words are the result of syntactic operations (Siddiqi 2014). As a consequence, there is no true morphology-syntax interface according to this view, as morphological processes and the formation of morphologically complex words take place in the syntax. According to some versions of Anti-Lexicalism, the order of constituents within a word is the result of syntactic operations, Distributed Morphology and Nanosyntax being two examples of this (Siddiqi 2014). Thus, words are generated in the syntax, and their internal structure reflects syntactic operations.

In this paper I assume a model of grammar where complex words are produced in the syntax, and where the structure of these complex words reflects syntactic operations. Thus, a rather strong version of Anti-Lexicalism is adhered to in this study, following along the lines of frameworks like Nanosyntax (Starke 2009) and Distributed Morphology (Halle & Marantz 1993).

One of the primary arguments against Lexicalism is that the concept of a word as distinct from the syntax domain cannot be maintained (Siddiqi 2014). It has been argued that there are neither a categorical definition of a word nor a set of criteria that can be employed to distinguish a complex word from a phrase, which is necessary if one posits a separate grammar module for the production of words (Siddiqi 2014). Another argument is based on patterns from highly agglutinative languages. It would require a too large computational load on the lexical memory to store all possible multi-morpheme constituents before they are inserted into the syntax. Even if one instead posits that words are produced in a separate module, it still would constitute a huge computational burden. An Anti-Lexicalist model simply assumes that both

processes take place in the same module and is therefore not burdened with an extra cognitive load. An Anti-Lexicalist approach furthermore provides an elegant account of typological variation where words in some languages correspond to affixes in others, even though the relative order is still the same. Examples are presented and discussed in (6) and (7) below in subsection 2.2.4.

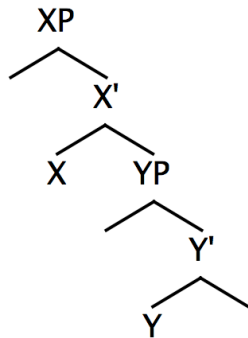
In the next section, I outline how morphologically complex words can be generated in the syntax, how their order of morphemes in complex words reflects syntactic operations and some restrictions related to these operations.

2.2.4. Morphologically Complex Words

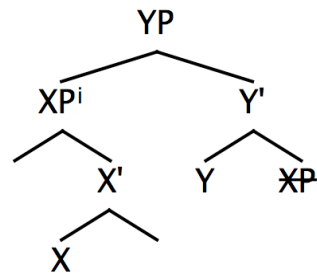
Head movement is one of the syntactic operations behind the forming of complex constituents. This way of deriving a complex constituent is traditionally assumed to be the process behind the derivation of tensed verbs in French, to provide an example (Roberts 2010). In French, it is standardly assumed that the V^0 moves to the T^0 where the two heads merge to form a morphologically complex constituent, as evident by the fact that certain adverbs follow finite verbs but precede non-finite verbs. (Roberts 2010). However, there are several other ways to derive morphologically complex words within the theoretical framework employed here. This is illustrated in Julien's (2002) discussions on wordhood, where structural adjacency is taken to be the primary prerequisite for heads to be regarded as components of a complex word. Thus, the word-formation process is not restricted to the moving and merging of syntactic heads. Structural adjacency can be reached in several ways. Examples are illustrated in Figure 1 below, all providing examples of how the order XY of two heads in a complex word can be derived. Firstly, if two heads are base generated in two adjacent phrases, they are already structurally adjacent (provided that no intervening material is located in the Spec of the lower phrase) and can form a morphologically complex word without movement (1a) (Julien 2002). It is the phonology during spell out that determines that they are realized as a single word, rather than as two separate words (Julien 2002). Additionally, a lower phrase can move to the Spec of a higher phrase, in which case they are also structurally adjacent, albeit in the reverse order, and can thus form a complex word (1b) (Julien 2002). Furthermore, a third phrase can be moved to the Spec of the second phrase, in which case its head can form a morphologically complex word with the head of the first

phrase (1c) (Julien 2002). Finally, the derivation of a complex word via head movement is illustrated in (1d), where X^0 is moved to Y^0 and a morphologically complex word is formed (Julien 2002).

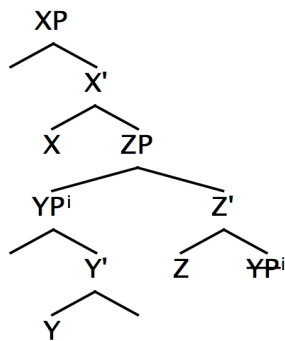
a.



b.



c.



d.

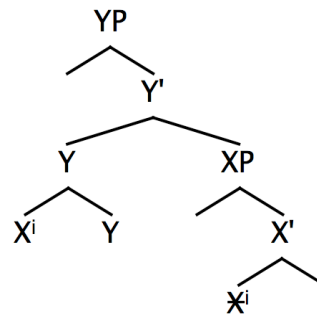


Figure 1 Derivations of the complex word XY

The above account of word formation is based on Julien's (2002) work and it places strong constraints upon how the order of morphemes in the surface structure of complex words is reached. For instance, if a head of a lower projection is moved and merged with a head in a higher projection to form a morphologically complex word, the head in the higher projection surfaces as a suffix to the lower head, as illustrated in Figure 1d. Imposing such strong restrictions upon syntactic operations and word formations also entails strong empirical predictions, and there is strong cross-linguistic empirical support for the model of grammar as outlined by Julien (see Julien (2002) for further details). However, other versions of word formation without such

strong restrictions (and such strong predictions) are also possible. Baker's Mirror Principle (Baker 1985, 1988) constitutes an interesting example. According to the Mirror Principle, syntactic derivations are directly reflected in morphological derivations, and vice versa (Baker 1985). The Mirror Principle makes the prediction that affixes are ordered by syntactic operations and structures in their relative distance to their respective roots (Baker 1985). It does not impose the same strong predictions on head movement and the ordering of constituents as Julien's (2002) description of word formation does. However, it does imply that heads of functional projections, whether realized as bound affixes or as independent words, appear in the same relative order (or its mirror image) to the verb, a claim that has received strong cross-linguistic empirical support.

Moreover, since adverbial verbs are assumed to be base generated as overtly realized heads of functional projections (see section 2.2.5. for further details), adverbial modifiers realized in the surface structure as verbal affixes ought to be regarded as having the same underlying structure (see section 2.2.6. for further details). This is the case since they would be unable to form morphologically complex words if they were overtly realized as phrasal units rather than heads. An Anti-Lexicalist approach explains such variation in a suitable manner.

A parallel can be drawn to the different realizations of tense markers in languages that overtly encode tense. Hindi (Indo-European: India) and Turkish (Turkic: Turkey) constitute two illuminating examples. In Hindi, tense is marked with a separate auxiliary-like constituent that also encodes subject agreement (6). Conversely, in Turkish tense is marked with a suffix on the verb (7). Nevertheless, both markers still encode tense, even though their surface realizations differ. The tense marker in the Turkish example must be a head, otherwise it would be unable to be realized as a suffix. The tense marker in the Hindi example is likewise a head. Had it been a phrasal unit, it would have been unable to form a complex constituent with the agreement marker. A similar parallel can be seen on the aspect markers in the two languages as well. Moreover, the relative order of the aspect and tense markers with regards to the placement of the verb is the same. The difference lies in whether the heads of these two functional projections are realized as separate words in the surface structure or as affixes.

6. Hindi (My glossing)

tu: seb **kha:** **rah-a:** **th-a:**
2SG.FAM apple **eat** **PROG-SG.M** **PST-SG.M**
'You were eating an apple.'
(Koul 2009, 285)

7. Turkish (My glossing)

Ayten bir banka-da **çalış-ıyor-du**
PN one bank-LOC **work-IMPF-PST**
'Ayten was working in a bank.'
(Göksel & Kerslake 2005, 112)

Even though the surface realizations of the aspect and tense markers in Hindi and Turkish are different, it is clear that they ought to be classified into the same category of languages where tense and aspect are overtly marked with tense and aspect heads, respectively. Similarly, languages where adverbial modifiers are realized as verbal affixes and languages where they surface as adverbial verbs ought to be classified into the same category. In both cases, functional projections encoding adverbial meanings are overtly realized as heads. As discussed above, an Anti-Lexicalist account of word formation provides an elegant and economical explanation of this kind of variation.

Moving on to the mechanisms behind syntactic movement, movement is taken to be the combination of the three primitives Agree, Merge and Pied-pipe, following Chomsky (2000). In later formulations (e.g. Chomsky 2008), Agree is not a compulsory component during movement, where Move without Agree corresponds to A'-movement (Roberts 2010). In this paper, I follow Roberts (2010) in assuming that head movement is part of narrow syntax. Head movement is assumed by Roberts (2010) to be Move without the Pied-pipe primitive, enabling the minimal projection to move out of its maximal projections (Roberts 2010). I will not elaborate on the details behind syntactic operations of Move here (see Roberts (2010) for further details). However, some of the constraints related to head movement are relevant for the theoretical explanation of adverbial verbs and are therefore elaborated upon in further detail here.

Roberts (2010) rejects the Head Movement Constraint (Travis 1984), primarily on empirical grounds. The Head Movement Constraint basically imposes restrictions upon the distance a head can move, prohibiting heads from moving across a

governing head position (Travis 1984). Instead, Roberts (2010) argues that head movement is subject to the same locality constraints as XP-movement. Thus, under this stipulation, head movement is expected to allow the "skipping" of intermediate heads. However, certain requirements must be met for this to be possible. First of all, the intermediate heads must have different features than that of the probe and the goal, as only this would satisfy the non-intervention requirement on Agree (Roberts 2010). Secondly, the probe has to be in the same phase as the goal, or alternatively the goal might be the head of the immediately succeeding phase, as it then would be visible to the probe (Roberts 2010). In practice this implies that most of the time, morphemes occur in the same hierarchical order, but this can sometimes be overridden if the two morphemes are of a similar category and not too structurally different.

These theoretical conjectures are used in this study to explain the derivation of adverbial verbs and are therefore elaborated upon here. In the next section, I discuss the theoretical model of adverbs employed in this paper and outline a proposition of the derivation of adverbial verbs.

2.2.5. Adverbs

Within generative grammar, there are two primary views regarding the analysis of adverbs, one treating adverbs as adjuncts, the other treating them as being situated in functional projections. In the analysis presented by Chomsky (1995) for the Minimalist Program, adverbs are treated as adjuncts. These are adjoined to the structure via recursion of the phrase in which the adverb is located. Ernst (2007) correspondingly defends an adjunct model of adverbs, where the licensing of adverbs is primarily based on semantic principles.

Cinque (1999) defends the other view, where a rich hierarchy of functional projections is assumed to be located in the backbone of the clause. Instead of assuming that adverbs are adjoined as adjuncts as done by Ernst (2007) and Chomsky (1995), Cinque (1999) argues that they are part of the clause and located in fixed positions, just like functional projections such as tense and aspect. This approach to adverbs, and the undertaking of describing their placement within the clause, is commonly referred to as the Cartographic Program. Cinque (1999) argues that these

functional projections are an inherent part of Universal Grammar, and are thus the same for all speakers of all languages. This includes the base generated order of the projections. The argumentation for this position is primarily based on the complexity and details of these distinctions as well as cross-linguistic conformity.

The Cartographic Program can be criticized for going against the minimalistic principles first outlined for the Minimalist Program. Furthermore, it begs the question of how such a rich hierarchy of projections could have evolutionarily evolved as part of Universal Grammar. This kind of criticism against the Cartographic Program is presented by, among others, Ramchand & Svenonius (2014). They instead attempt to derive a relatively rich functional hierarchy, in addition to its internal structure, from extra linguistic cognitive constraints, rather than from Universal Grammar. According to Ramchand & Svenonius (2014), people possess a cognitive proclivity to discern experience in different sortal domains in terms of propositions, situations and events, which they argue correspond to the C-, T- and V-domains within the minimalist program, respectively. Just as the V-domain is located within the T-domain, with the T-domain subsequently being embedded in the C-domain, events, situations and propositions are likewise structurally ordered (Ramchand & Svenonius 2014). EVENT, which contain thematic participants, are situated within SITUATION, which have both time and world parameters, unlike EVENT. SITUATION is contained within PROPOSITION (which presupposes a SITUATION), which is anchored in the utterance context, thus having force in the discourse setting and encoding information regarding speaker-oriented parameters. These sortal domains also restrain the positions of functional projections (Ramchand & Svenonius 2014). Thus, the reason why epistemic modals are located in a position above aspect and the projections of verbal arguments is because they belong to different sortal domains. Epistemic modals belong to the PROPOSITION domain and verbal arguments to the EVENT domain, with aspect as a cut-off point between situations and events. Similarly, thematic participants belong to the EVENT sortal domain, therefore being located in a lower position in the structure than tense, which belongs to the SITUATION domain (Ramchand & Svenonius 2014).

Ramchand & Svenonius's (2014) conjecture illustrates that one can argue for the existence of a rich functional hierarchy without having to postulate that it is an

inherent part of Universal Grammar. In this paper, I assume the existence of a fairly rich functional hierarchy, although I make no claims regarding its details and exact nature. That is, I make no claims about the exact relative order of the functional projections or whether they are derived from extra-linguistic cognitive constraints or Universal Grammar. However, some generally accepted tendencies are assumed here, for instance that so-called *speaker-oriented adverbs* are situated in a relatively high position in the hierarchy, above *lower adverbs* like manner adverbs.

An important issue related to adverbs is whether or not the heads of functional projections containing adverbs are spelled out, or if they lack phonological realizations. Cinque (1999) argues that these functional projections have non-spelled out heads, and that the adverbs instead are overtly realized as phrases in Spec of these projections. These phrasal units would then surface as sentence adverbs.

In contrast, in languages with adverbial verbs these adverbial projections are spelled out as heads (Holmer 2012). These heads are then selected for feature checking in functional projections located above the adverb head. This proposed derivation is very similar to that of auxiliary verbs. The head containing the auxiliary verb is realized on the surface in functional projections above it, where e.g. [TENSE] is found, thereby preventing the main verb from moving, as it would violate the non-intervention requirement of Move. The same derivation is assumed for adverbial verbs. These heads are assumed to have the same interpretable features as that of verbs, resulting in the adverb being raised instead of the main verb. Therefore, the only underlying difference between auxiliary verbs and adverbial verbs is that they are the heads of different functional projections. Moreover, the difference between languages that have adverbial verbs and those that do not is simply reduced to differences in the phonological realization of functional projections containing adverbial modifiers. In the former, adverbial projections are spelled out as heads, while in the latter they are overtly realized as phrasal units.

According to the aforementioned explanation of the underlying structure of adverbial verbs, adverbial verbs have the same underlying structure as auxiliary verbs. As already mentioned, the difference between them is that they are the overt realizations of heads in different functional projections. What primarily distinguishes them is not

their morphosyntactic properties, but rather the content that they encode. They should therefore be regarded as a subgroup of auxiliary verbs, where they are distinguished from other auxiliary verbs by virtue of the semantic properties they possess, rather than based on formal criteria. Just like auxiliary verbs, adverbial verbs are not true verbs in the sense of being the heads of VPs, but they are heads of various functional projections and are classified as verbal due to the fact they hold many of the morphosyntactic properties that main verbs have. The difference then lies in that they are the realizations of heads in different functional projections. Further details on how adverbial verbs are dissimilar to auxiliary verbs are given in section 3.3.1.

The aforementioned description of adverbial verbs is based on Holmer's (2012) analysis of adverbial verbs in Formosan languages. However, there are some differences between the analysis presented here and the one defended by Holmer (2012). Holmer (2012) postulates that adverbial verbs prevent main verbs from raising due to the Head Movement Constraint, while the analysis presented here explains it via the analysis of head movement outlined by Roberts (2010). Figure 2 below illustrates the derivation of adverbial verbs, and how it prevents the main verb from raising to check features in T^0 , as they have the same interpretable feature.

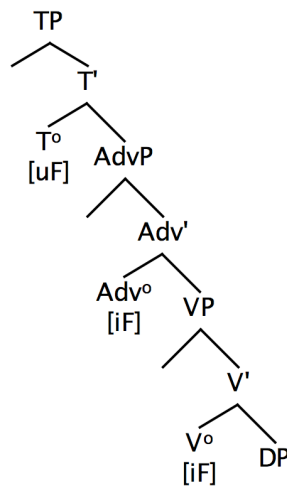


Figure 2 Underlying structure of adverbial verbs

This analysis of adverbial verbs makes predictions about the linear order of adverbial verbs and main verbs. In VO-languages, the adverbial verb is predicted to be situated

to the left of the main verb. Since it is the ADV^O that raises instead of the main verb in such languages, the adverbial verb ought to be located to the left of the main verb, which in turn is predicted to remain in a lower position. For head-final languages, the order is anticipated to be reversed. Thus, in a head-final OV-language, the main verb is predicted to be located to the left of the adverbial verb.

I argue that an adjunct analysis of adverbs, as proposed by Chomsky (1995) and Ernst (2007), is unable to adequately describe adverbial verbs. As mentioned in the previous paragraphs, adverbial verbs are understood to be base generated as heads in functional projections in this study. They are subsequently raised instead of main verbs and in the process they receive the verbal morphology of the clause. Since adjuncts are assumed to be islands, they would be unable to move to higher projections in the clause via head movement, and could therefore not be the host of the verbal morphology of the clause. One could reject the islandhood of adjuncts, thereby enabling adverb heads to be extracted out of adjuncts. However, an adjunct would still fail to prevent the verb head from being raised to higher projections to check its features. This is the case since the probe would search for a goal in its immediate projection first, rather than in an adjunct. Figure 3 below shows the proposed structure if one assumes an adjunct analysis of adverbs, in which case nothing prevents the head of the VP from raising to functional projections located higher up in the structure.

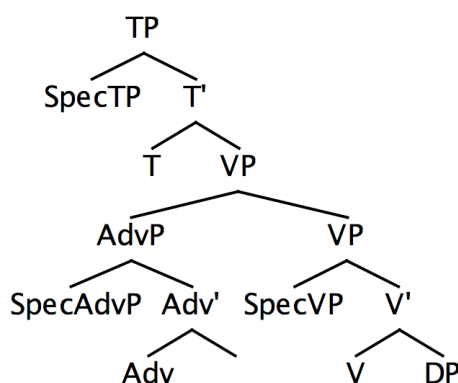


Figure 3 Adjunct analysis of adverbs

2.2.6 Derivation of Adverbial Modifiers as Affixes

Since I argue above that the realization of adverbs as verbal affixes and adverbial verbs have the same underlying structure, I ought to clarify what is meant by this. Two examples of adverbial modifiers as a verbal affixes are presented from Itzaj below, where they are realized as prefixes on verb roots. Aspect and subject agreement are likewise realized as prefixes upon verb roots in the examples below.

8. Itzaj

- a) Tan-u-**chich**-meyaj.
DUR-3A-**hard**-work
'S/he is working hard.'
(Hofing 2000, 382)
- b) K-u-**ma'lo'**-b'el.
INC-3A-**well**-go
'It goes well.'
(Hofing 2000, 382)

As argued in the previous section, what separates languages with adverbial verbs from languages without them is that in the former adverbs are overtly realized as heads, rather than as phrasal units. In languages where adverbial modifiers are realized as verbal affixes, as in Itzaj above, adverbs must likewise be overtly realized as heads, otherwise they would be unable to appear as verbal affixes in the surface structure. Therefore, languages like Itzaj ought to be classified into the category of languages where adverbial modifiers are overtly realized as heads, rather than as phrasal units, just like languages with adverbial verbs. Both of these are distinct from languages where adverbs are overtly realized as phrasal units.

As can be seen in (8a) and (8b) above, the adverbial modifiers are realized as verbal prefixes. Following Cinque's (1999) postulations, manner adverbial modifiers are situated in functional projections located above the verb. The same is true for aspect markers (Cinque 1999), and in Itzaj these are likewise realized as verbal prefixes. Following the Mirror Principle (Baker 1985, 1988), the order of the constituents in the syntax is reflected in the internal order of morphemes on a word level. This implies that in Itzaj, the relative order of the prefixes and the verbs has not been affected by movement, as they are already in the base generated order in the surface structure visible in 8 above. They might have moved during the generation of those clauses, although necessarily without affecting their relative order. If the phrases containing

their heads are in immediate adjacency to each other, and there is no intervening material in between them, they can be realized as one word due to the phonology during spell-out. An abstract model of such a derivation is illustrated above, in Figure 1d. It is the phonology that determines that they are realized as a complex word rather than as two separate words. This is the same analysis used by Julien (2002) to explain verbal prefixes in for instance Bantu languages. Again, adverbial modifiers are treated as heads of functional projections, just like the aspect and agreement markers in examples (8a) and (8b) above, and the underlying derivation of them as verbal prefixes is therefore the same for all of them.

In example (8a) from Itzaj, the aspect marker is located furthest to the left, followed by an agreement marker, an adverbial modifier and finally by the verbal root. Following Cinque (1999), one can assume that this is the base generated order. Agreement markers are quite variable in their placement and there might be several locations for them in the underlying structure (Julien 2002). Regarding Itzaj, it is then reasonable to assume that the agreement marker in (8a) is base generated in the position above the manner adverb and below the aspect marker. Abstracting away other projections and potential movements of the derivation, the underlying structure of (8a) is illustrated in Figure 4 below (Figure 4 is primarily included as an illustration of a suggestion for how the complex word in (8a) is derived and other representations might be more accurate). The example is reiterated above the figure for clarity.

Tan-u-chich-meyaj.
 DUR-3A-hard-work
 'S/he is working hard.'

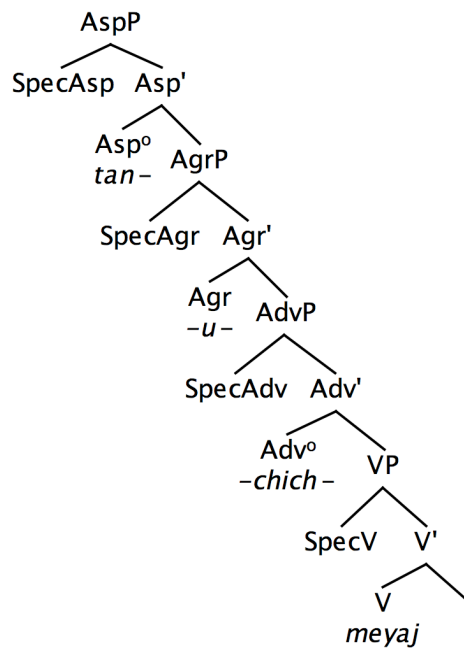


Figure 4 Underlying structure of: *tan-u-chich-meyaj*

Even though the surface structure of languages with adverbial verbs and languages with adverbial modifiers as affixes is very different, the surface structure reveals that the underlying structure is indeed the same. Thus, the two primary categories related to adverbial modifiers are one where they are overtly realized as heads, and the other where they are phrasal units.

2.2.7. Theoretical Account of Interrogative Verbs

The existence of interrogative verbs raises many theoretical issues related to interrogatives and interrogative clauses. It is still unclear what the syntactic operations behind the derivation of interrogative verbs are. An important theoretical issue in this regard is whether or not *wh*-movement applies to interrogative verbs, or if they are derived via the same syntactic operations that verbs usually are subject to.

While these theoretical issues are beyond the scope of this paper to answer, I present some preliminary suggestions. It appears to be a reasonable assumption that when interrogative verbs meaning 'do.what' occur as the sole predicate of a clause, they are

base generated in the head of VP. An example of this is given from Seediq in (9a), where the interrogative verbs functions as the primary predicate of the clause. In (9b), the same interrogative verb instead has a modifying function towards the main clause of the verb, instead meaning 'do.why'.

9. Seediq

- a) **Hwa-un=su** rodux=su kusun?
do.what-PF=2s chicken=2s tomorrow
 ‘What will you do to your chicken tomorrow?’
 (Holmer 2012, 907)
- b) **H<m-n>uwa=su** ini usa Taihoku?
<AF-PST>do.what=2s NEG go.AF.CNG Taipei
 ‘Why didn’t you go to Taipei?’
 (Holmer 2012, 907)

Considering the structural similarities between interrogative verbs co-occurring with main verbs and adverbial verbs, it is tempting to postulate that there are some structural similarities in their respective derivations. However, it is beyond the scope of this paper to investigate theoretical explanation for interrogative verbs and I leave this issue for future research.

3. Methodological Framework

This chapter outlines the theoretical framework of this paper. I begin by discussing some methodological issues related to cross-linguistic identification in 3.1. before moving on to describe the languages sample used in this study in 3.2. Section 3.3.1 contains a description of the definition used for adverbial verbs, while 3.3.2. illustrates how adverbial verbs were located in language descriptions. Section 3.3.3. presents the definition of interrogative verbs used in this paper and 3.3.4. discusses how they can be found in language descriptions.

3.1. Cross-linguistic Identification

Cross-linguistic identification is an important methodological issue that must be dealt with in any typological study. Put briefly, the problem relates to how one can be certain that the typological database used in a study constitute a coherent body of facts (Strassen 2011). Strassen (2011) argues that both external and formal criteria must be utilized in order to prevent the scope from becoming either too broad or too narrow. An overreliance on external criteria would cause the scope to become too wide, while an overreliance on formal criteria would cause it to become too narrow (Strassen 2011). According to Strassen (2011), the combination of both functional and formal domain definitions as the best strategy to ensure the validity of a typological study is agreed upon by most typologists today.

This approach is adopted in this study, where both functional and formal domain definitions are employed to identify adverbial verbs and interrogative verbs, respectively, in the typological database used in this paper.

3.2. Language Sample

A convenience sample (Bakker 2011) was used in this typological study, where languages from as a diverse set of genera and geographical areas as possible were included. Only verb-initial languages were included. Following Dryer (1992), the languages are classified according to geographical areas, in order to control for and make visible potential areas biases. The six geographic areas used by Dryer (1992) are South East Asia and Oceania, Eurasia, Africa, Australia and New Guinea, North America and South America. No languages from Australia and New Guinea were

included due to the lack of verb-initial languages in that region. Afro-Asiatic languages spoken in Southwest Asia were classified as belonging to Africa. Languages spoken in Central America are classified under South America, with the exception of languages from the Uto-Aztecan language family, which are included in the North American region.

Following Dryer (1992), languages are classified according to their genera. This was done to control for and make visible potential genetic biases in the sample. By classifying languages according to genera, one can also ensure that a sample has a wide genetic representation as possible. 60 languages from 43 different genera across 19 language families were included in the sample. Their geographical distribution is illustrated below. See appendix 2 for a detailed list of the languages included in the sample.

Table 1 Language Sample

	S. E. Asia and Oceania	Eurasia	Africa	North America	South America	Total
Genera	14	1	6	8	14	43
Languages	15	1	12	10	22	60

There were several factors contributing to the employment of a convenience sample in this study. One is related to the relative rarity of the phenomena explored here. Since both adverbial verbs and interrogative verbs are assumed to be typologically rare phenomena, a random sample might give no languages with these phenomena. It was therefore necessary to deliberately include languages that already contained attested findings of adverbial or interrogative verbs. By including these languages, the hypothesis claiming that there is a positive correlation between adverbial and interrogative verbs in verb-initial languages could also be tested. Subsequently, languages from most major language families with verb-initial word order were included. Their respective genera were controlled for so that the largest possible genetic diversity was represented in the language sample. Languages were also selected based on their geographic distribution in order to cover as wide a geographic area as possible. This way, even though the languages included in this study are not statistically representative due to geographical and genetic biases, at least a relatively large and diverse set of genera from different geographical areas are represented the sample.

As mentioned previously, only verb-initial languages were included in this sample. This decision was partially based upon patterns observed on adverbial verbs and interrogative verbs in Formosan languages. An attempt was made to extend these generalizations to test if they would hold against a larger empirical base founded on a more geographically and genetically diverse language sample. Since Formosan languages are verb-initial, only verb-initial languages were included in the sample. Furthermore, I also attempted to map the distribution of adverbial verbs in verb-initial languages, as it had been claimed by Holmer (2012) that they are more common in verb-initial languages. Structural arguments explaining Holmer's (2012) conjecture were presented in the introduction and are not reiterated here. Thus, no non-verb-initial languages were included in the sample.

3.3. Definitions

3.3.1. Defining Adverbial Verbs

Since adverbial verbs have received little attention within typological research, no readily available definition could be employed at the onset of this study. A major methodological undertaking of this study was therefore to develop a typologically valid definition of adverbial verbs, as well as developing a method that could be used to identify them in language descriptions and language data. I first provide a definition for adverbial verbs, followed by a description of how these were located in language descriptions in section 3.3.2.

The semantic content of adverbial verbs examined in this study is relatively limited. They encode temporal information and the manner of which an event unfolds. Consequently there is a significant overlap between their semantic content and that of manner adverbs and temporal adverbs. Regarding the manner content, it provides information of in what way or how the event encoded by the main verb of the clause unfolds. An example from Chol (Mayan: Mexico) is given below (10), where the adverbial verb meaning 'fast' encodes information of how the event encoded by the main verb meaning 'go.down' unfolds. Another example is given from Seediq (11), where the adverbial verb meaning 'at.will' provides information of in which way the event encoded by the main verb meaning 'beat' unfolds.

10. Chol

ajñel(-ø-ob)=bi tyi ju'b-i-y-ø-ob tyel
fast-B3-PL3=REP PRFV go.down-IV-EP-B3-PL3 DIR:toward
'It is said they come down really fast.'
(Alvarez 2011, 368)

11. Seediq

M<n>hmet-an=mu beebu ka quyu kiya.
<PST>at.will-LF=1sE beat NOM snake that
'I recklessly beat that snake.'
(Holmer 2012, 903)

The semantic content of adverbial verbs providing temporal information encodes when the event referred to by the main verb unfolds. Auxiliary-like tense markers are not included. Examples are presented from Maasai and Sierra Popoluca (Mixe-Zoquean: Mexico) below, in (12) and (13), respectively.

12. Maasai (My glossing)

- a) **ki-ta-yookit-o** aa-tur
 1PL-PST-do.in.morning-PST PL.INF-dig
 'At that time we dug it in the morning'
 (Tucker & Mpaayei 1955, 97)
- b) **a-ta-sik-o** a-lep
 1SG-PST-soon-PST SG.INF-milk
 'I soon milked it'
 (Tucker & Mpaayei 1955, 97)

13. Sierra Popoluca

ʔii **ʔanh-jak-ʔoʔy-pa** ʔi-káʔ
and **be.first-ANTIP-INC** 3ERG=die-DEP
'...and he'll die first'
(De Jong 2009, 357)

Adverbial verbs do not refer to events or states. They are therefore distinct from verbs that refer an event and the manner in which said event unfolds. Examples of this can be found in English, with words like 'to stumble' in the sentence 'He stumbled down a dark passage'. Here *stumble* means roughly 'to walk or go unsteadily'. This is not an adverbial verb, since it encodes both the event as well as the manner of the event.

There is a huge overlap between the formal properties of adverbial verbs and main verbs. Regarding their morphological properties, both of them host what Hagege (2008) refer to as 'verbants'. These are grammatical morphemes that are primarily or exclusively associated with verbs, such as "...tense, aspect, and mood, [...] valency, transitivity or intransitivity morphemes, voice, directional, predicative, and special

verbal markers, and finally to person markers” (Hagege 2008, 8). Which verbants that are associated with adverbial verbs is not universal, as languages differ in which of these verbants that are overtly encoded in the verbal morphology. Furthermore, it is not necessarily the case that adverbial verbs can host all of the verbants that lexical verbs can host in a given language. In several of the languages explored in this study, adverbial verbs can only host a limited selection of the verbants that main verbs take. For instance, adverbial verbs in Itzaj only take the completive aspect marker, in contrast to main verbs, which host several other aspect markers (Hofling 2000, 47). An example from Itzaj is given below (14), illustrating how the adverbial verb can host verbants (aspect and person markers), while Kavalan shows tense, voice and person markers as verbants on an adverbial verb (15). This is different from the example given from Sierra Popoluca in (13) above, where the adverbial verb does not host person markers.

14. Itzaj

chich-aj-ij	u-b'et-ik
hard-CIS-3SG.B	3A-do-ITS
's/he had to do it hard, quickly'	
(Hofling 2000, 47)	

15. Kavalan

paqanas-an-ku-pa	pasaqay	ya	qRitun
slow-PF-1S.GEN-FUT	drive[AF]	NOM	car
'I will drive my car slowly'			
(Chang 2006, 48)			

The primary syntactic property of adverbial verbs is that they are located in the verbal slot of the clause, that is, the slot reserved for the finite verb of the clause. The exact relative position of the finite predicate of a clause differs from language to language and no universal criteria for where this position is in relation to other constituents can be given. Furthermore, adverbial verbs tend to not occur by themselves as the sole verbal unit of a clause. This is the case since they do not by themselves actually refer to any event or state, and must therefore be accompanied by a main verb. A possible exception from this would be if the event in question were obvious from the context, just like in English, where auxiliaries can be used as the proform for an entire VP (16). Chang (2007) points out that adverbial verbs in Kavalan can occur on their own without a main verb, also together with nouns, provided that the context is clear enough (17).

16. English

- A: Will you go to school tomorrow?
B: Yes, I will (go to school tomorrow).

17. Kavalan

paqasiR tu qRitun
fast[AF] obl car
'He drives fast'
(Chang 2006, 46)

It ought also be clarified that being able to host verbants is neither a sufficient nor necessary prerequisite for being an adverbial verb. I only claim that hosting verbants is a property prototypically associated with adverbial verbs, just like it is prototypically associated with verbs in general. Failing to have them does not necessarily exclude a given item from the category adverbial verbs. This is especially true for analytical languages with little or no bound verbal morphology. In such languages, one instead has to rely upon the distribution of adverbial modifiers within the clause to determine whether or not they are adverbial verbs. Conversely, being the host of verbants does not necessarily mean that a constituent is an adverbial verb. Maori constitutes an enlightening example.

Manner adverbs in Maori passivize to agree with the lexical verb of the clause, as can be seen in (18) below. (18a) shows how an adverb takes a passive marker in agreement with the verb, and (18b) demonstrates an adverb without a passive marker. These adverbs are not classified as adverbial verbs, since it does not possess the syntactic properties associated with adverbial verbs, namely being situated in the slot reserved for the finite predicate. In Maori, this position is located immediately after the tense/aspect markers of a clause, which are occupied by 'oppress' and 'sleep' in the examples provided in (18) below.

18. Maori

- a) I peehi-**a** **rawa-tia** ngaa waahine
 T/A oppress-**pass.** **INTS-pass.** the(pl) women
 'The women were severely oppressed'
 (Bauer 1993, 92)
- b) Ka moe **pai** ia
 T/A sleep **good** 3SG
 'He slept soundly'
 (Bauer 1993, 92)

Based on the theoretical explanation of the derivation of adverbial verbs (see 2.2.5. above), conclusions can also be made regarding the relative placement of the adverbial verb and the main verb. In verb-initial languages, and VO-languages in general, the adverbial verb is expected to be located to the left of the lexical verb, which remains in a lower position in the clause. This is another reason why the adverb in Maori in (18) above is not considered an adverbial verb.

Of course there can be exceptions to this ordering of constituents, but they will necessarily be the result of A'-movement, rather than A-movement. An example of this is given below from Puyuma, where the entire VP is topicalized and moved to a position to the left of the adverbial verb. (19a) illustrates the unmarked order, and (19b) with the verb phrase, including the object, as a sentence topic, preceding a topic marker.

19. Puyuma

- a) **patawar-Ø=ku** m-aip dra trilin.
 slowly-AV=1SG.NOM AF-read OBL book
 'I read books slowly.'
 (Li 2007, 19)
- b) m-aip dra trilin i, **patawar-Ø=ku.**
 AF-read OBL book TOP **slowly-AV=1SG.NOM**
 'As for reading book, I do so slowly.'
 (Li 2007, 19)

The position of the adverbial verb in relation to the main verb ought to be the reverse in a head-final OV-language. It is not necessarily the case for all OV-languages, as Julien (2003) claims that there are two kinds of OV-languages with regards to the IP-structure. One type is consistently head-final, and the other is not. In languages belonging to the former group, adverbial verbs are predicted to follow the main verb, just like auxiliary verbs tend to do in such languages (Julien 2003). Regarding the latter category, it is not necessarily the case that adverbial verbs follow main verbs, and their relative order might be the same as in the verb-initial languages examined in this study. Note that these are just theoretical predictions that need to be tested against empirical data before they are accepted.

There are other important syntactic properties prototypically associated with adverbial verbs. They ought to belong to the same clause as the main verb with which they co-

occur. That is, the main verb is not base generated inside a separate CP to that of the adverbial verb. Likewise, the do not appear in separate IPs. Thus, adverbial verbs are not expected to have a separate argument structure. Similarly, there are not two sets of verbal inflections, one for the adverbial verb and one for the lexical verb, since they share a single IP. It might very well be the case the same feature is morphologically encoded upon more than one constituent, as might be the case of for instance agreement marking. Nevertheless, only a single set of verbal inflections per clause is expected for clauses containing adverbial verbs.

In order to distinguish adverbs from adverbial verbs, primarily morphosyntactic properties have to be taken into account, since there is a significant overlap in the semantic content of adverbial verbs and that of temporal and manner adverbs. Adverbial verbs can be distinguished from adverbs by their ability to host verbants, be located in the predicate slot of a clause and be the finite predicate of a clause. They are distinguished from main verbs primarily via their semantic content, as they never refer to events or states, which is a prototypical property of main verbs. There are syntactic properties that can be used to distinguish adverbial verbs from lexical verbs as well. Adverbial verbs tend to not occur by themselves (unless the context sufficiently clear), unlike lexical verbs. Additionally, adverbial verbs are often defective verbs, in the sense that they do not have all formal properties associated with prototypical verbs in their respective languages.

There is also a significant overlap between the formal properties of adverbial verbs and that of auxiliary verbs. Both of them host verbants, they have the ability to appear in the predicate slot of a clause, they can be finite predicates and they both fulfill a modifying function towards main verbs. Indeed, there are substantial structural similarities between adverbial verbs and auxiliary verbs in languages that possess both (see (27), (31) and (32) for examples of their structural similarities in Puyuma, Sierra Popoluca and Itzaj, respectively). This is to be expected under the assumption that the suggestion for the underlying structure of adverbial verbs presented here is accurate (see section 2.2.6.), as the underlying structure of adverbial verbs and auxiliary verb is very similar. A possible classification of adverbial verbs could therefore be as a subcategory to auxiliary verbs. However, even if one would classify

them as auxiliary verbs, I maintain that there are sufficient grounds for distinguishing them from other subcategories of auxiliary verbs.

Adverbial verbs are distinguished from auxiliary verbs by virtue of the semantic content that they encode. While auxiliary verbs tend to primarily encode grammatical information, adverbial verbs have semantic content, encoding manner and temporal information. Furthermore, while auxiliary verbs tend to form a closed class, adverbial verbs can be regarded as forming an open class, considering its many members and the diversity of the semantic content that they encode. Additionally, adverbial verbs encoding temporal information can be distinguished from auxiliary-like tense markers. While both of them can be said to encode temporal information, the latter tends to encode grammatical information such as [FUTURE] and [PAST]. In contrast, the former has semantic content regarding temporal information that is more specific, such as 'do.in.the.morning' and 'soon' (Maasai, example (30)), 'be.first', (Sierra Popoluca, example (31)) and 'always' (Bella Coola, example (33)), just to name a few examples. In summation, adverbial verbs are structurally very similar to auxiliary verbs and could reasonable be classified as such. However, they are different from auxiliary verbs (or other subcategories of adverbial verbs, if classified as such) by virtue of the semantic content that they possess.

Regarding the formal properties of adverbial verbs, they can be understood as existing on a continuum based on how many verbal properties they have. In some languages, there is a significant overlap between the formal properties of verbs and those of adverbial verbs, while other languages have adverbial verbs with only a few verbal properties. Adverbial verbs with many verbal properties can easily be identified as adverbial verbs, whereas adverbial verbs located on the other side of the spectrum are more difficult to clearly identify as adverbial verbs. They also approach a point where they no longer can be regarded as adverbial verbs. Likewise adverbial verbs can be understood as existing along another axis, moving from transparent to opaque, where adverbial verbs with more overt morphology are more transparent, and vice versa. This is dependent upon the morphological type of the language, where more synthetic languages are more transparent, and more analytic languages are more opaque. This approach to cross-linguistic comparison is illustrated in more detail in the results chapter.

Before moving on to the definition of interrogative verbs, I discuss the method I used to search for and identify adverbial verbs in grammatical descriptions and language data during the course of this study.

3.3.2. Finding Adverbial Verbs

Since adverbial verbs do not constitute a generally recognized linguistic category, grammars and language descriptions rarely have them listed as a separate category. Consequently, one has to look for them in other sections. A notable exception to this is descriptions of Formosan languages, in which the term adverbial verb is regularly employed.

If a language has adverbial verbs, information about them can often be found under the section describing adverbs, although this is not always the case. In said section, the author might claim that the information encoded by adverbs in many European languages (English is usually held as reference point) is instead expressed by verbs or by verbal morphology. The former is done in Antonissen's (1958) description of Kadazan (Austronesian: Borneo), and the latter in Sonnenschein's (2005) description of Northern Zapotec (Oto-Mangean: Mexico) and Frantz's (1991) grammar on Blackfoot (Algonquian: Canada, United States). It is not always the case that it is stated explicitly though. Information and samples are sometimes found in the adverb section, and sometimes the reader is referred to other sections.

If the sections concerning adverbs in grammars do not explicitly state that manner adverbs are replaced by verbs or verbal morphology, one can still find valuable information about the morphosyntactic properties of adverbs in these sections. Based on these observations, one can determine whether or not a language has adverbial verbs. The morphosyntactic properties of the adverbs have to be compared to those of main verbs in the language, to determine whether or not there is an overlap between their formal properties. If there is a significant overlap between the two, it suggests that the language has adverbial verbs. Note that they also ought to be cross-referenced with the properties outlined for prototypical adverbial verbs as discussed above. In the sources used in this study, this was the case in Danielsen's (2007) description of

Baure (Arawakan: Bolivia) and Bauer's (1993) description of Maori, just to mention a few examples.

Moreover, adverbial verbs might also be listed as a special category of verbs. This is the case in Badawi et al.'s (2004) description of Modern Standard Arabic where adverbial verbs are listed as a special kind of verb in the language. Adverbial verbs can also be found in sections dealing with serial verb constructions, as in Donohue's (1999) description of *Tukang Besi*. This is understandable since constructions containing adverbial verbs can be structurally similar to serial verb constructions, depending on the definition used for serial verb constructions.

Finally, adverbial verbs are also listed as auxiliary verbs in certain grammars. This is a common way in which adverbial verbs are classified. This kind of classification was found in the works of Toker & Mpaayei (1955) on Maasai, in Hofling's (2000) description of Itzaj and in De Jong's (2009) grammar on Sierra Popoluca, to state a few examples. If they are listed as auxiliary verbs, one can expect that to have at least some properties associated with verbs. However, their formal properties should still be compared to that of main verbs.

In this section I outlined the properties associated with adverbial verbs, both formal and semantic. I also described where in grammars one could expect to find adverbial verbs, since they are rarely listed as a separate category under the name adverbial verbs. In the next section, I provide the definition used for interrogative verbs, in addition to how and where to find them in grammars.

3.3.3. Defining Interrogative Verbs

The semantic content of interrogative verbs is quite diverse (Hagege 2008). In this study, I focus on the semantic content of 'do.how', 'do.what' and 'do.why', because they are the interrogative verbs that are expected to develop in analogy with adverbial verbs. Interrogative verbs do not refer to arguments or adjuncts of a verb, but are predicates that question the very semantic content of the event or state encoded by said predicate (Hagege 2008). They are thus distinct from question words like 'how' or 'what', which refer to an adjunct and an argument of a verb, respectively.

Regarding the formal properties of interrogative verbs, they are, just like adverbial verbs, characterized by being able to be the predicate of a clause and be located in the predicate slot of a clause. They are also characterized by being the host of verbants, again like adverbial verbs. Similarly, there is no universal criterion for the formal properties of interrogative verbs, as the verbants that verbs host differ from language to language (Lin 2012). Furthermore, the position of the predicate slot in relation to other constituents also differs from language to language. One must therefore consider the formal properties of the verbs in a given language before one can determine whether or not a said language has interrogative verbs. Additionally, they might also be defective verbs, in the sense that they do not have all the formal properties that main verbs have, just like adverbial verbs.

Examples are presented below from Kavalan in (20) and from Comox (Salishan: Canada) in (21). They illustrate how interrogative verbs function as the verbal predicate of a clause, in addition to hosting verbants (voice, aspect and person markers in the examples below).

20. Kavalan

q<um>uni=isu tangi?
<AV>do.what=2SG.ABS just.now
 'What were you doing just now?'
 (Lin 2012, 192)

21. Comox (My glossing)

ta-tʌm-čxʷ
IMPF-do.what-2.SG
 'What are you doing?'
 (Harris 1981, 145)

Interrogative verbs are distinct from predicatively used yet non-verbal interrogative words (Hagege 2008). These are non-verbal question words that function as predicates in for instance nominal-predicate sentences, and are not verbal in the sense of the interrogative verbs above. An example from Russian (Indo-European: Russia) is given below, showing an interrogative word functioning as a nominal predicate.

22. Russian

ty kto
 2SG who
 'Who are you?'
 (Hagege 2008, 14)

While I rely heavily upon Hagege's (2008) typological study for the definition of interrogative verbs, I diverge somewhat from his classification. This is primarily a consequence of different theoretical approaches, as a generative approach is partially employed in this study. Hagege (2008) asserts that interrogative verbs are dedicated in the sense that they only function as interrogative verbs and that they are not derived. This position is not maintained here. I instead regard words that function exclusively as interrogative verbs and those that function both as regular interrogative words and as interrogative verbs as both being interrogative verbs. This is the case as I assume an Anti-Lexicalist approach to word formation, implying that these different functions are not the result of different entries in the mental lexicon, but that of different syntactic operations. The definition used here is therefore not as restricted as that of Hagege (2008). This moreover enables the inclusion of important data that would have otherwise been lost. Such an example is Maori, where the word for 'what' can function both as an argument of a verb (23a), as well as an interrogative verb ((23b) and (23c)).

23. Maori

- a) He **aha** kua mahue i te tamaiti?
 a **what** T/A leave behind cause the child
 'What has the child left behind?'
 (Bauer 1993, 8)
- b) I **aha-tia** te tamaiti raa
 T/A **what-pass** the child dist
 "What happened to that child?"
 (Bauer 1993, 14)
- c) E **aha** ana a Hata i te raakau raa
 T/A **what** T/A pers Hata DO the tree dist
 'what is Hata doing to that tree?'
 (Bauer 1993, 13)

Interrogative verbs can occur as the sole predicate of a clause (as seen in (23b) and (23c) above). They also co-occur with main verbs, in which case they tend to have a modifying function towards the main verb (Hagege 2008). Words that mean 'do.what' often translate into 'do.how' or 'do.why' when they occur together with a main verb. An example is given from Seediq in (24a) and (24b) below, where the word is used for both 'do.what' and 'do.why'. Examples from Puyuma in (25a) and (25b) below illustrate how the same interrogative verb means both 'do.what' and 'do.how', depending upon the syntactic environment it is in.

24. Seediq

- a) **H<m-n>uwa=su** ini usa Taihoku?
<AF-PST>**do.what=2s** NEG go.AF.CNG Taipei
'Why didn't you go to Taipei?'
(Holmer 2012, 907)
- b) **Hwa-un=su** rodux=su kusun?
do.what-PF=2s chicken=2s tomorrow
'What will you do to your chicken tomorrow?'
(Holmer 2012, 907)

25. Puyuma

- a) **kuda-kuda=mu** Tungul?
<ITR>**RED-how=2P.NOM** <ITR>connect
'How do you connect?'
(Teng 2007, 348)
- b) **ka-kuda=ku=la** an kemaDu
RED-how=1S.NOM=PERF if such
'If such things happen, what shall I do?'
(Teng 2007, 348)

3.3.4. Finding Interrogative Verbs

Interrogative verbs are generally found under the section discussing question formation in grammatical descriptions. This is fairly self-explanatory. However, it is rarely the case that they are referred to as interrogative verbs. An exception to this is in descriptions of Formosan languages, where the term enjoys a relatively wide recognition. Instead they might simply be listed among other interrogative words without special mention, as is the case in Beck's (1995) description of Bella Coola (Salishan: Canada) and Lushootseed (Salishan: Canada, United States). Interrogative verbs might also be described as question words that can question a predicate, as in Danielsen's (2007) grammar on Baure, or as question words that question activities, as in Harris's (1981) description of Comox.

In order to then determine whether or not any of the interrogative words in a language qualify as interrogative verbs, one has to examine the formal properties of verbs in said language and then cross-reference these to the formal properties of the interrogative words. If there is a significant overlap between the formal properties of the two categories, this is a good indication that there are interrogative verbs in the language. One should also examine the semantic content, to ensure that they refer to predicates by themselves and not adjuncts or arguments of a verb. They should also match the semantic and formal properties outlined above.

4. Results

The results of this typological study are presented in this section. *4.1.* discusses adverbial verbs by presenting examples from different genera and geographic regions. More transparent and prototypical examples are presented first, before moving on to more opaque and less prototypical ones. *4.1.1.* presents findings of adverbs as verbal affixes in addition to discussing their underlying structure and derivation, while *4.1.2.* provides instances of adverbs functioning as matrix verbs. Some examples from Nilo-Saharan languages are presented in *4.1.3.* They are given as separate section as they challenge the theoretical description of adverbial verbs outlined assumed in this paper but I argue that they ultimately constitute a different syntactic structure. *4.1.4.* includes examples from Mayan languages, as they illustrate the variety found synchronically in a single genus.

Findings of interrogative verbs are presented in *4.1.* where more prototypical and transparent examples are presented first, followed by more opaque and less prototypical instance of interrogative verbs. Examples of interrogative verbs with other semantic content than the ones examined here are outlined in *4.2.1.* The distribution of adverbial verbs and interrogative verbs in the language sample employed here are presented in *4.3.* Finally, examples of adverbial verb in non-verb-initial languages are discussed in *4.4.*

4.1. Adverbial Verbs

Adverbial verbs in Kavalan take voice and tense affixes, in addition to being the hosts of subject clitics, as is illustrated in (26a). These are typical features of verbs in Kavalan, as is also illustrated in (26b) below, which contains a main verb with verbal morphology. If the tense and argument markers appear on the lexical verb instead of the adverbial verb when both are present, the clause is rendered ungrammatical, which is illustrated in (26c). Kavalan constitutes both a fairly prototypical example, as well as being quite transparent, due to the amount of verbal morphology that is attached to the adverbial verb. In such prototypical examples, the adverbial verb is located in the predicate slot, and becomes the host of much of the verbal morphology as well as verbal clitics. It constitutes the finite predicate of the clause.

26. Kavalan

- a) **paqanas-an-ku-pa** pasaqay ya qRitun
slow-PF-1S.GEN-FUT drive[AF] NOM car
 'I will drive my car slowly'
 (Chang 2006, 48)
- b) **q<m>an=ti=iku** tu esi na babuy.
<AV>eat=PFV=1SG.ABS OBL meat GEN pig
 'I have eaten pork.'
 (Lin 2012, 184)
- c) ***paqanas-an** **pasaqay-ku-pa** ya qRitun
slow-PF **drive[AF]-1S.GEN-FUT** NOM car
 (Chang 2006, 48)

Puyuma is another language with prototypical and fairly transparent adverbial verbs. Just as in Kavalan, the voice morphology and subject clitics end up on the adverbial verb when an adverbial verb is present, instead of the main verb, upon which they prototypically attach. (27a) provides an example of an adverbial verb. The similarity that is often found between adverbial verbs and auxiliary verbs is illustrated in (27b) below, where an auxiliary likewise hosts voice markers and subject clitics. Finally, (27c) provides an example of a main verb with voice marking.

27. Puyuma

- a) **ku=patawar-ay** m-aip na trilin.
1SG.GEN=slowly-LV AV-read NOM book
 'I read the book slowly.'
 (Li 2007, 5)
- b) **ma-ruwa=ku** m-ekan dra patraka.
AV-can=1SG.NOM AV-eat OBL meat
 'I can eat meat.' or 'I am allowed to eat meat.'
 (Li 2007, 7)
- c) **m-ekan** dra kuraw i pilay.
AV-eat OBL fish NOM Pilay
 'Pilay eats fish.'
 (Li 2007, 3)

Both Arabic and Hebrew (Afro-Asiatic: Israel) are Semitic languages that have adverbial verbs that are structurally very similar to what is found in Formosan languages. They are the finite predicates of their respective clauses. In the Arabic examples, the adverbial verbs are marked for subject agreement and aspect. This suggests that these are heads generated below the aspect head, and are subsequently raised to check features that would prototypically be checked by the main verb. Unlike in the Formosan languages discussed above, the main verb is realized in a

nominalized form in Arabic. Similarly, Hebrew adverbial verbs are marked overtly for tense, suggesting that they are raised to T to check tense features, which prototypically happens to the main verb. These must be located above the VP, to prevent the main verb from being the target of feature checking from T.

28. Modern Standard Arabic (My glossing)

- a) **ajzala** lahu l-'ata'a
3SG.PERF.plentiful to.3SG DEF-NMZ.give
 'He gave generously to him'
 (Badawi et al. 2004, 434)
- b) **sara'a** qa'ilan
3SG.PERF.quickly NMZ.say
 'he said hurriedly'
 (Badawi et al. 2004, 434)
- c) la-qad 'asa'ta fah-mi
 DEF-part **2SG.PERF.bad** understand-1SG.OBJ
 'you have misunderstood me'
 (Badawi et al. 2004, 435)

29. Hebrew (My glossing)

- a) **Hetiv** lenagen
PST.well INF.play
 'Played well'
 Hebrew (Glinert 1989, 225)
- b) **miher** ledaber
PST.quick INF.speak
 'Quickly spoke'
 Hebrew (Glinert 1989, 225)

Badawi et al. (2004) points out that this way of forming manner adverbials was much more prominent in Classical Arabic than in Modern Standard Arabic, but it still is a productive process in the modern language. However, the modern language has developed a productive derivational affix, which is used to produce adverbs (Badawi et al. 2004). Similarly, using adverbial verbs in Hebrew is regarded as more formal and more archaic (Glinert 1989).

Maasai has fairly prototypical adverbial verbs. They encode primarily temporal information, but also manner. They are tensed, while the main verbs following them are not. The adverbial verbs also take subject markers. Non-finite main verbs agree with subjects in number. (30a-e) illustrate adverbial verbs, while (30f-g) provide examples of main verbs. Since the adverbial verbs are tensed, rather than the main

verbs when both are present in a clause, one can assume that just like in Hebrew, the adverbial verbs are base generated in a position below T, but above the VP.

30. Maasai (My glossing)

- a) **a-sioki** a-lep
1SG.PRS-quick SG.INF-milk
 'I will milk it quickly'
 (Tucker & Mpaayei 1955, 97)
- b) **i-yookiki** aa-tur
2PL.PRS-do.in.morning PL.INF-dig
 'You will dig it in the morning'
 (Tucker & Mpaayei 1955, 97)
- c) **ki-ta-yookit-o** aa-tur
1PL-PST-do.in.mornong-PST PL.INF-dig
 'At that time we dug it in the morning'
 (Tucker & Mpaayei 1955, 97)
- d) **a-ta-sik-o** a-lep
1SG-PST-soon-PST SG.INF-milk
 'I soon milked it'
 (Tucker & Mpaayei 1955, 97)
- e) **k-intoki** aa-puo
1PL.PRS-again PL.INF-go
 'We'll go again'
 (Tucker & Mpaayei 1955, 97)
- f) **a-nyor** in-kiri
1SG.PRS-like FEM-meat
 'I like meat'
 (Tucker & Mpaayei 1955, 60)
- g) **a-ta-rany-a**
1SG-PST-sing-PST
 'I sang'
 (Tucker & Mpaayei 1955, 53)
- h) **ki-ta-rany-a**
1PL-PST-sing-PST
 'We sang'
 (Tucker & Mpaayei 1955, 53)

Sierra Popoluca has adverbial verbs, which typically encode temporal information. They are identified as verbs because they can take aspect markers and appear as the finite predicate in the initial position of the clause. The main verbs following these adverbial verbs always appear with a dependency marker suffix. Examples are given in (31a) and (31b). This is also the case when main verb co-occur with auxiliary verbs, as is illustrated in (31c).

31. Sierra Popoluca

- a) ?ii **?anh-jak-?o?y-pa** ?i-ká?-W
 and **be.first-ANTIP-INC** 3ERG=die-DEP
 '...and he'll die first'
 (De Jong 2009, 357)
- b) ?ii **já?y-W-nam** ?a-?úuk-i
 and **stay.late-CMP=still** 1ABS=drink-DEP
 'and we stayed late drinking'
 (De Jong 2009, 356)
- c) **wi?-?aH-wi=tyi=?am** ?i=nay-W je?m tziixi
 3ABS=be.able-CMP=just=ALR 3ERG=be.born-DEP that child
 'The baby could still be born'
 (De Jong 2009, 357)

Itzaj also has adverbial verbs similar to the prototypical ones found in for instance Kavalan and Arabic. Since both aspect and argument affixes are realized as suffixes on adverbial verbs, these also constitute fairly transparent examples. (32a-c) provide examples where adverbial verbs appear in the initial predicate position and take aspect morphology as well as subject markers. (32d) shows their structural similarity to auxiliary verbs in the language, which likewise take aspect and subject markers. Finally (32e) provides an example of a main verb with similar morphological properties (aspect and subject marking).

32. Itzaj

- a) **chich-aj-ij** u-b'et-ik
 hard-CIS-3SG.B 3A-do-ITS
 's/he had to do it hard, quickly'
 (Hofling 2000, 47)
- b) **olak-aj-ij** u-wen-el
 almost-CIS-3SG.B 3A-sleep-IIS
 's/he almost slept'
 (Hofling 2000, 47)
- c) **suk-aj-ij** u-wen-el
 CUST-CIS-3SG.B 3A-sleep-IIS
 's/he was accustomed to sleep'
 (Hofling 2000, 47)
- d) **tak-aj-ij** u-wen-e/
 DES-CIS-3SG.B 3A-sleep-IIS
 's/he wanted to sleep'
 (Hofling 2000, 47)
- e) **satz'-n-aj-ij**
 stretch-AP-CIS-3SG.B
 's/he stretched (something)'
 (Hofling 2000, 57)

There are also adverbial verbs in Bella Coola. These appear before the main verbs, which in turn are not finite, instead appearing in a nominalized form. This differs somewhat from what was found in Formosan languages, where the lexical verb is not nominalized as in Bella Coola, but similar to what we see in Arabic. (33a) and (33b) give examples of adverbial verbs, which take subject markers, thereby visibly being verbal. (33c) illustrates a lexical verb to show that subject markers prototypically occur on lexical verbs of a clause. In clauses with non-verbal predicates, the main verb also takes a nominalized form. However, non-verbal predicates do not take subject markers, as seen in (33d). This provides support for the analysis that the adverbial verbs given in (33a) and (33b) indeed are verbal, and not just non-verbal predicates. Bella Coola is not as transparent as some of the aforementioned examples, due to its lack of verbal morphology on adverbial verbs.

33. Bella Coola (My glossing)

- a) **xiliwa-is** s-ʔmt-s
quick-3SG NMZ-get.up-3SG.POSS
 'He was quick as he got up'
 (Beck 1994, 3)
- b) **sʔay-it** s-ksmaw-aw
always-3PL NMZ-work-3PL.POSS
 'They are always working'
 (Nater 1984, 134)
- c) **tx-is** ti-ʔmsta-tx ti-qlix^w-tx x-ti-tqʔa-tx
cut-3SG D-person-D D-rope-D P-D-knife-D
 'The person cut the rope with the knife'
 (Beck 1994, 15)
- d) **ʔaʔ-ti-sunx^wt** s-ksnmak-aw
P-D-day NMZ-work-3PL.POSS
 'It is today that they are working'
 (Beck 1994, 10)

Cebuano (Austronesian: The Philippines) has a relatively transparent structure. Adverbial verbs can occur in the verbal slot of predicate complex, in which case it is tensed and takes voice markers, as seen in (34a) (In Cebuano, tense and voice are encoded by portmanteau morphemes, which are transcribed as AV (Actor Voice) and PV (Patient Voice) in the examples below, following Tanangkangsing (2009)). They can also take subject clitics, as seen in (34b). Furthermore, they can also occur in the initial position of a verb complex, in which case they become the host of several second position clitics, which prototypically occur on the lexical verb ((34c) and

(34d)). Finally, they can also occur as a matrix verb, taking a subordinate clause as its complement (34e). This kind of structure is discussed in further detail below.

34. Cebuano

- a) wala?=siya **nag-lisod**, kay ma?ayo iya-nga doctor
 NEG=3S.NOM AV-difficult because good 3S.POSS-LK doctor
 'She didn't have a hard time (giving birth) because her doctor was good.'
 (Tanangkangsing 2009, 273)
- b) **Usab-on=nako?** ug buhat
 Again-PV=1S.GEN LK do
 'I will do it again'
 (Tanangkangsing 2009, 291)
- c) **Panangsa=ra=man=siya** pa-uli
 Rarely=only=PAR=3S.NOM CAU-return
 'He rarely goes home'
 (Tanangkangsing 2009, 174)
- d) **ka-duha=na=siya** ni-uli?
 FREQ-two=already=3S.NOM AV-return
 'He has already gone home twice.'
 (Tanangkangsing 2009, 291)
- e) ma?ayo=kato-nga doctor, wa?=siya **mag-lisod** ug panganak
 good=that-LK doctor NEG=3S.NOM AV-difficult COMP give.birth
 'That doctor was good. She did not have difficulty giving birth.'
 (Tanangkangsing 2009, 281)

One can claim that there are two major types of adverbial verbs in Cebuano, one where the adverb appears in the initial position of the clause, becoming the host of second position clitics (including subject clitics). This function is otherwise often fulfilled by the verb. The other type has more in common with prototypical verbs in Cebuano, as adverbial verbs of this type take voice/tense morphology, which is prototypically marked on the lexical verb.

Toba Batak (Austronesian: Sumatera) can be said to have two kinds of adverbial verbs. One kind always takes the passive voice marker, and occurs in the initial predicate slot of the clause. This kind of adverbial verb can encode both manner and temporal information. In contrast to the Formosan languages discussed above, adverbial verbs in Toba Batak can only take passive voice markers, and are unable to alternate between different voice markers. (35a) provides an example. These do not share as many features with verbs as adverbial verbs in for instance Puyuma and Kavalan, as discussed above. The fact that they are the predicates of the examples below is further supported by the location of the predicate markers *do* (35b) and *ma* (35c), which follow predicates in Toba Batak.

35. Toba Batak (My glossing)

- a) **di-tuttun** mar-ikkat mang-eahi
PASS-faster/harder ITR-run AV-chase
 'They ran the harder, pursuing him'
 (Van Der Tuuk 1971, 259)
- b) **hu-paduwa-hali do** hu-topot
1SG.PASS-second-time AFF 1SG.PASS-visit
 'Yet I've visited him for the second time'
 (Van der Tuuk 1971, 258)
- c) sali **di-datdati ma** di-tuttun ma-naek -
 still **PASS-onwards NARR** PASS-fast STA-climb
 'He kept climbing onwards, ever faster.'
 (Van der Tuuk 1971, 259)

The other kind of adverbial verb also constitutes the predicate (it occupies the slot before the predicate markers) of a clause. However, they do not take voice markers, which is a prototypical feature of verbs in Toba Batak. Therefore, one could argue that these are not adverbial verbs at all, since they lack the verbants usually associated with verbs in Toba Batak. One could then regard these as non-verbal predicates. Still, it could be reasoned that they simply are frozen and reduced forms of previously more productive variants. Due to the lack of transparency in these examples, one instead has to rely on their position in the clause to make qualified guesses.

36. Toba Batak (My glossing)

- a) **denggan do** hu-dingding, **denggan do** hu-tarup
neatly AFF 1SG.PASS-provide.walls **neatly AFF** 1SG.PASS-provide.roof
 'neatly have I provided that sopo with walls, neatly have I provided it with a roof.'
 (Van der Tuuk 1971, 262)
- b) **toktong do** ibana ringgas
always AFF 3SG diligent
 'he is always diligent'
 (Nababan 1981, 115)
- c) **ringgas do** halak i marsi-ajar
diligently AFF person DEF ITR-study
 'that person studies diligently'
 (Nababan 1981, 115)

The claim that Baure has adverbial verbs can also be made, since adverbs in Baure can take predicate morphology, including argument markers, as seen in (37a) and (37b) below, where they host change of state suffixes and argument clitics. In (37c), a directional verb suffix is realized on the initial adverb of the clause. These are not as prototypical as the examples discussed above, since they do not have as many verbal

characteristics as some of the aforementioned examples. For instance, they are not preceded by aspect markers (for instance *ver* in samples (37a) and (37b) below), as main verbs in Baure typical are.

37. Baure

- a) herik **vero-wapa=ro** ver ro=im
 maybe **already-COS=3SGm** PERF 3SGm=be.cooked
 ‘Maybe it (the food) is already ready, it is already cooked.’
 (Danielsen 2007, 107)
- b) noka **heno-wapa** nik koeč mavi-wapa=ni
 NEG **good-COS** 1SG.eat because sick-COS=1SG
 ‘I cannot eat well any more, because I am very sick.’
 (Danielsen 2007, 179)
- c) **enevere-ro¹-a-pik** ver ri=woyik teč rotir desayun te ri=šir
next.day-ro-LK-COME PERF 3SGf=make DEM2m 3SGmP breakfast DEM1m 3SGf=son
 ‘When the next day came she made breakfast for her son.’
 (Danielsen 2007, 107)

Maori has adverbs located immediately after tense/aspect markers, which is the prototypical position for Maori verbs. This suggests that the adverb in (38a) has verbal properties. (38b) shows a lexical verb preceded by a tense/aspect marker, while (38c) illustrates a topicalized constituent, which then precedes both the verb and the tense/aspect marker. The sample in (38c) provides support for the analysis that *aahua* in (38a) below actually is located in the predicate slot and that it is not simply a topicalized constituent. Note that the adverbial modifiers that can appear as adverbial verbs in Maori are what Cinque (1999) refers to as lower adverbs, including manner and temporal adverbs (*aata* 'carefully', *maatua* 'first', etc. (Bauer 1993, 92)). This supports the analysis that only lower adverbs (i.e. the ones located below T⁰/Fin⁰) can function as adverbial verbs, as argued by Holmer (2012). Note that Maori is fairly opaque when compared to some of the languages discussed above, due to the lack of verb morphology. One has to rely upon the placement of the adverb in the clause, rather than upon morphology, to determine whether or not it has any verbal properties. This is necessary in more analytical languages like Maori. However, as seen in the examples in (38) below, the position of the adverb suggests that it is an adverbial verb.

¹ *-ro-* is a suffix placed on predicates and it fulfils several functions and its exact meaning is still unclear. Following Danielsen (2007) it is transcribed simply as *-ro-* here (see Danielsen (2007, 407f) for a discussion).

38. Maori

- a) **Ka aahua** pukuriri a Tamahae ki a Rewi
T/A somewhat angry pers Tamahae to pers Rewi
 'Tamahae was somewhat angry with Rewi' (TR2, 5)
 (Bauer 1993, 92)
- b) **Ka whaangai-a** ngaa manu (e ia)
T/A feed-pass. the(pl) bird by 3SG
 'The birds were fed by her'
 (Bauer 1993, 91)
- c) **Ko ngaa manu ka** whaangai-a e ia
top. the(pl) bird T/A feed-pass. by 3SG
 'It was the birds that were fed by her'
 (Bauer 1993, 91)

Now I move on to what can be regarded as less prototypical adverbial verbs. The languages presented here have adverbs that attract verbants, and thus give the appearance of being adverbial verbs. However, it is not only adverbs that can become the host of these verbants, but other constituents as well. This might be regarded as a separate subgroup of adverbial verbs, where not just adverbs attract verbants, but also other constituents.

In Nuuchahnulth, tense, agreement and mood markers occur on the first constituent of the clause. This can be a verb (39a), an adverb (39b) and a negation particle (39c). Aspect markers, on the other hand, always occur on the verbs. These are all realized as suffixes. *Wh*-moved arguments of the verb can also host tense and agreement suffixes (39d).

39. Nuuchahnulth

- a) **wał-[L+]-šič-mit-s**
go.home-CONT-PERF-PST-1SG.ABS
 'I was in the process of going home.'
 (Wodjak 20, 91)
- b) **witýax-mit-s** wał-[+L]-šič
slowly-PST-1SG.ABS go.home-CONT-PERF
 'I was slow in going home'
 (Wodjak 20, 91)
- c) **wik-mit-s** witýax wał-[+L]-šič
NEG-PST-1SG.ABS slowly go.home-CONT-PERF
 'I wasn't slow in going home'
 (Wodjak 20, 91)
- d) **?ačaq-mit-ḥ** huul-a[+R]
who-PST-3.Q dance-ITER
 'Who was dancing?'
 (Wodjak 20, 51)

According to Davidson (2002), arguments of the verb can be fronted in Nuuchahnulth, in which case the verbants remain in their original position, attached either to the head of the predicate or to a modifier. This suggests that these verbants can only attach to heads and not to phrases. (40a) below provides an example where they are attached to the verb, while (40b) provides an instance where they are attached to a verbal modifier. Finally, (40c) shows how they are unaffected by the fronting of one of the arguments of the verb. Note that the fronting yields a contrastive reading (Davidson 2002). This also suggests that the *wh*-moved interrogative words that can host verbants in Nuuchahnulth are heads, rather than phrasal units.

40. Nuuchahnulth

- a) **nunu'k='aʔ=mit=ma=aḥ** ýu'q'wa'
sing=TEMP=PAST=INDIC=1SG likewise
'I was singing too'
(Davidson 2002, 107)
- b) **ýu'q'wa'='aʔ=mit=ma=aḥ** nunu'k='aʔ
likewise=TEMP=PAST=INDIC=1SG sing=TEMP
'I was singing too'
(Davidson 2002, 107)
- c) **ýu'q'wa'='aʔ** **číša'ʔath=ʔi'** **wiʔakʷ** su-kʷiʔ='aʔ ʔaʔ-yu'=ʔi'
likewise=TEMP **Tseshahṭ=ART** **warrior** hold-PERF=TEMP twisted-having.been=ART
'A Tseshahṭ warrior likewise took hold of the (Maktliath) cedar line'
(Davidson 2002, 112)

One can therefore claim that Nuuchahnulth, and structurally similar languages, belong to a special subgroup of languages with adverbial verbs, where a wider range of heads, not just adverbial heads, can be moved to the initial position and host verbants. In Nuuchahnulth, this includes, as illustrated above, negatives and interrogatives. It does not include phrasal units such as topicalized NPs, as shown in (40c) above. This analysis rests on the claim that *wh*-words in Nuuchahnulth are heads and not phrasal units, as these can host verbants. Donati (2006) argues for the existence of *wh*-head movement, implying that *wh*-movement does not necessarily have to be phrase-movement. No evidence was found suggesting that the *wh*-words in Nuuchahnulth are phrasal units and the claim that these are heads rather than phrasal units is therefore maintained here.

In Comox, adverbs have verbal features and appear to be adverbial verbs. According to Harris (1981), the predicate of a clause is identified as the constituent hosting the

(Bascom 1982, 275). While no conclusive evidence was found that phrases can host verbants in Tepehuan, the fact that topicalized pronoun subjects can host them suggests that this is possible. However, it might also be the case that it simply is a head that hosts verbants in such sentences, as these subject pronouns might be heads rather than phrases.

42. Northern Tepehuan

- a) **kaši=a=t** íi piill ðimos mai=kíá d'íva duliánsa
already=B=PERF went PN but not=yet come PN
 "Philip has gone but Lencho has not come yet"
 (Bascom 1982, 278)
- b) **káši=a=n=mai=ta** iml-da
now=B=1SG=NEG=COMPL go-?
 'I'm not going to go now'
 (Bascom 1982, 280)
- c) **ááni=a=n=t** íi
1SG=B=1SG=COMPL went
 'I went'
 (Bascom 1982, 280)
- d) **gáámo=a=pi=sa** imí-na
there=B=2SG=QUOT go-POT
 'He says for you to go there'
 (Bascom 1982, 281)
- e) **gii=á=n=ta**
fell=B=1SG=COMPL
 'I fell'
 (Bascom 1982, 280)
- f) **kaši=a=n=t** íi
already=B=1SG=COMPL went
 'I already went.'
 (Bascom 1982, 280)
- g) **0=t=óór** dáfvusai llkíápo
3SG=COMPL=who passed earlier
 'Who went by earlier?'
 (Bascom 1982, 292)
- h) ši-óór mááti š-t^vumáá=ši-ka-mu góóvai
 DUB=who know SUBR=**what=Q-STAT-FUT** 3SG
 Who knows what he will turn out to be?
 (Bascom 1982, 292)

Makassar (Austronesian) also has clitics that usually appear on the initial verb (43a), but they also occur on auxiliary verbs (43b), as well as on adverbs, as can be seen in (43c) and (43d). Negative particles can also host these (43e), in addition to interrogative words ((43f) and (43g)), and finally also arguments of the verb (43h). It

is evident from the example in (43c) that the clitics can be attached to phrases and not only heads, and it can therefore be concluded that the structure in Makassar differs from the one in Nuuchahnulth.

43. Makassar

- a) **la=ku=sare=mo=ko** pa> aC-areng<ang
FUT=1=give=PFV=2f NR>MV-name<NR
 'I will give you a naming (right now)'
 (Jukes 2006, 146)
- b) **le'ba'-ki'** aC-je'ne-je'ne nai'-ki' ri pulo-a
finished-1PL.ABS INTR-RDP-water climb-1PL.ABS LOC island-DET
 'After we'd swum we landed (went up) on the island.'
 (Jukes 2006, 334)
- c) tallas=a' **ija=pa=i** anrong mangge=ku
 alive=EC **still=IPF=3** mother father=1.POSS
 'My parents are still alive.'
 (Jukes 2006, 158)
- d) **kamma=i** tu pongor=o'ea gio'na
thus=3 INDF mad=EC=DEF manner=3.POSS
 he acts like a madman
 (Jukes 2006, 192)
- e) **tea-mo-a'** nakke nai'-i ri balla'
NEG-PRF-1SG.ABS 1SG.EMPH climb-APPL LOC house
 'I won't climb up to the house.'
 (Jukes 2006, 192)
- f) **la=kere=ko** mae
FUT=where=2f be
 'where are you going?' (lit. where will you be?)
 (Jukes 2006, 146)
- g) **kere=mo=i** mae pa>amm-antang<ang=nu
where=PFV=3 be NR>MV-live<NR=2f.POSS
 'where exactly is your home?' (C:459)
 (Jukes 2006, 147)
- h) ingka **se're=pa=i** ku=boya
 but **one=IPF=3** 1SG=search
 'but there's still one thing I seek'
 (Jukes 2006, 148)

Nuuchahnulth, Tepehuan and Makassar appear to constitute a continuum, where Nuuchahnulth is the most restrictive and Makassar is least restrictive when it comes to the placement of verbants. They are all less restrictive than languages with more prototypical adverbial verbs, where only verbs (main and auxiliary) and adverbial verbs host verbants. Nuuchahnulth could then still be regarded as a language with adverbial verbs, although not very prototypical. Conversely, Makassar probably falls

beyond a reasonable cut-off point of what can be regarded as language with adverbial verbs, while Tepehuan is located somewhere between the two. In this paper, Tepehuan and Nuuchahnulth are classified as having adverbial verbs, while Makassar is not classified as such.

The remaining two languages discussed in this section (Lushootseed and Yagua (Peba-Yaguan: Peru, Colombia)) both have adverbs with some verbal properties, although they are not classified as having adverbial verbs. They are included here to illustrate where a reasonable cut-off point might be for languages whose adverbs still have some verbal features, but nevertheless differ significantly from more prototypical adverbial verbs.

Some verbal features on adverbs can be observed in Lushootseed, although the claim that these are adverbial verbs is quite weak. As can be seen in (44a), verbs can take the change of state suffix, which instead falls on the adverb preceding the verb (44b), if one is present. Furthermore, there are so-called predicate particles in Lushootseed, which appear in the position immediately following the verb, as seen in (44c) and (44d). However, if there is an adverb present in the clause, the predicate particles appear in the position following the adverb, not following the verb (examples in (44e-g)).

44. Lushootseed (My glossing)

- a) huy, qł-ax^w ti bəščəb
 then, wake.up-COS D mink
 'then the mink woke up'
 (Hess 1995, 69)
- b) tiləb-əx^w ʔu-sax^w tiʔił bəščəb
 immediately-COS PRF-run that mink
 'The mink ran immediately'
 (Hess 1995, 89)
- c) ʔu-ʔəʃ ʔu ti č'ač'as
 PRF-come INT DEM child
 'Did the boy come?'
 (Hess 1995, 7)
- d) ʔu-ʔü^w čəw^w ʔu
 PRF-go 2SG INT
 'Did you go?'
 (Hess 1995, 6)

- e) day'-əx^w čəd cick^w ʔəs-laqil
 especially-COS 1SG very STA-late
 'Indeed, I am very late'
 (Hess 1995, 90)
- f) hik^w čəx^w ʔu ʎu-xǎł-qid
 big(severe) 2SG INT HAB-sick-head
 Do you generally get severe head-aches?
 (Hess 1995, 90)
- g) day'-əx^w əw'ə six^w ʔu-saʔil tiʔəʔ qaw'qs
 especially-COS mild.surprise again PRF-become.bad this raven
 'Raven really struck his foot (got into trouble) this time'
 (Hess 1995, 90)

Since Lushootseed is fairly opaque, one has to rely upon position rather than morphology, and the fact that the predicate particles appear after the adverb instead of the verb suggests that the adverb is located in the position normally occupied by the verb. Furthermore, focused arguments in for instance clefts do not host the change of state clitics, nor do they occur directly in front of the predicate particles (Hess 1995, 98). There are therefore some verbal features associated with clause initial adverbs in Lushootseed that are not associated with other initial elements. Lushootseed therefore differs from Makassar in that regard. However, the claim that Lushootseed has adverbial verbs is quite weak, due to their lack of verbal properties.

Assuming a prototype approach to cross-linguistic classification, while the adverbs in Lushootseed share some of the features associated with more prototypical adverbial verbs, they probably fall outside the range of what can reasonably be called adverbial verbs. In other words, there is something verbal about these adverbs, although very little. Nevertheless, since they do share some of these features, they are included here, although primarily for illustration of where a cut-off point might be.

On a similar note, another relevant example is Yagua. Second position clitics that are attached to the main verb of the clause can also attach to auxiliary verbs, if present, or to adverbs if they precede the verb (Payne 1985). This suggests that the adverbs are verbal and located in the position normally occupied by the verb. However, they also attach to other elements before the verb, which indicates that any topicalized element can become the host of these clitics, not just verbal element. The claim that these are adverbial verbs is quite weak, and this language probably also falls outside a reasonable cut-off point. Second position clitics can also appear on full nouns in

Yagua, suggesting that they can attach to phrases and not just heads. Payne (1985) claims that entire phrases can be located in the pre-verbal position and host second position clitics. This suggests that Yagua is distinct from languages like Nuuchahnulth, where only heads can attract verbal clitics, implying the two languages structurally different.

45. Yagua

- a) ra-nuuy-nniuy-**numaa** rooriy
 INAN-burn-COMPL-**now** house
 'now the house has finished burning'.
 (Payne 1985, 69)
- b) mitva-**numaa** jlryey-y nicyee-jSy vidya-jaree
 only-**now** 2PL-IRR talk-PROX2 sunlight-under
 'From now on you will only chirp on bright days'.
 (Payne 1985, 69)
- c) Vuuryy-y-**numaa** jaachipiiaa
 IPL.INCL-IRR-**now** think
 'We are now going to think'.
 (Payne 1985, 69)
- d) Nii-**numaa** jjjta sa-quiivypchu-ntiy
 3SG.OBJ-**now** JITTA 3SG-deceive-REP
 'He deceived him again'.
 (Payne 1985, 70)
- e) jaá-**dyéeta** sa-jatu-jásiy jaamu-ra jíy-viimu-jù
 water-**maybe** 3SG-drink-PROX1 big-CL.NEUT COR-inside-AL
 'Water maybe he drank a lot (of it) inside (his stomach)
 (Payne 1985, 324)

4.1.1. Adverbial Modifiers as Affixes

In this section, I describe languages where adverbial modifiers are realized as verbal affixes. While the surface structure of these languages differ significantly from what was discussed in the previous section, I nevertheless argue that the underlying structure is the same and that the difference is merely at a surface level. Only adverbial modifiers as verbal affixes that encode manner are included here. This was done to avoid including languages with aspect affixes, as it would have been too difficult to distinguish these from languages with temporal adverbial modifiers realized as verbal affixes. An example from Itzaj is reiterated below in (46).

46. Itzaj

K-u-**ma'lo'**-b'el.
 INC-3A-**well**-go
 'It goes well.'
 (Hofing 2000, 382)

The fact that this adverbial modifier is realized as an affix on a verb is evidence for the claim that these are heads and not phrasal units. One can thereby argue that the underlying structure in languages with adverbial modifiers realized as adverbial verbs and languages with adverbial modifiers realized as verbal affixes have the same underlying structure. Therefore, they ought to be classified into a single category. Languages in this category are distinct from languages where adverbs are realized as phrasal units (see sections 2.2.5. and 2.2.6. above for more details).

Nine languages with incorporation of adverbs were found in this study, all of which are located either in North America or South America. In eight of these languages, the adverbial modifier is located to the left of the verb root, realized as a prefix. I will not go into a detailed description of how they are derived (see section 2.2.6. above for details on the derivation of adverbial modifiers as affixes).

In Huasteca Nahuatl (Uto-Aztecan: Mexico), the adverbial modifiers are likewise realized as prefixes, as is object agreement. In contrast, a causative marker and an aspect marker are realized as suffixes in (47a) and a tense marker is realized as a suffix in (47b). (47c) provides an example of a main verb without an adverbial modifier.

47. Huasteca Nahuatl

- a) Ki-**yoka**-tat-i:-to
3SG.OBJ-**on purpose**-to.burn-CAU-PERF.towards.there
'He went to burn it on purpose'
(Wolgemuth 2007, 123)
- b) Ne:-**nohma**-ihl-ih.
1SG.OBJ-**openly**-tell-PRET
He told me openly.
(Wolgemuth 2007, 123)
- c) ma:lt-ih
bathe-PRET
'He bathed'
(Wolgemuth 2007, 30)

In Blackfoot adverbs are also realized as prefixes immediately preceding the verb root. The adverbial modifier can be preceded by aspect markers (48a), first and second person agreement markers (48b) as well as intensifiers (48c). Like in Huasteca

Nahuatl, there is no intervening material between the adverbial modifier and the verb root. (48d) gives an example of a verb without adverbial modifiers as affixes.

48. Blackfoot

- a) á-**ipoina**-ooyi-wa
 DUR-**fanatic**-eat-3SG
 'He's eating fanatically'
 (Frantz 1991, 91)
- b) kit-**iiyik**-a'po'taki
 2-**hard**-work
 "You work hard"
 (Frantz 1991, 91)
- c) kit-ik-á-**sok**-a'po'taki
 2-very-DUR-**good**-work
 "You work very well"
 (Frantz 1991, 91)
- d) apinakosi yáa-a-okska'si-o'pa
 tomorrow FUT-DUR-run-3PL.INCL
 'Tomorrow we will be running'
 (Frantz 1991, 33)

Quileute (Chimakuan: United States) is another language with adverbial modifiers realized as prefixes on the verb root. An example is presented in (49) below.

49. Quileute (My glossing)

ha't'c-i-kits
good-LINK-dance
 'He dances well'
 Quileute (Andrade 1933, 262)

Zapotec (Northern) diverges somewhat from the patterns in the examples above, since the adverbial modifiers are realized as suffixes, rather than as prefixes. Note that while most of these adverbial modifiers emphasize the activity encoded by the verb, adjectives can also be realized as verbal suffixes, functioning as manner adverbials. Zapotec (Northern) can thus also be classified into the category of languages encoding adverbial meanings of manner via verbal affixation. Adverbial modifiers emphasizing or intensifying the event encoded by the verb root are found in all examples in (50) below, written in bold. (50c) illustrates how an adjective is realized as a verbal suffix, and subsequently functioning as an adverbial modifier. Even though the relative order of the adverbial modifiers and the verb roots in (50) is the reverse of the previous examples, the relative distance between them is nevertheless

the same, with no intervening material between the adverbial modifiers and the verb roots.

50. Zapotec (Northern)

- a) konte' b-en-**dx**=a' ganh
 so.that COMPL-do-**more**=1SG earn
 '...so that I earned more...'
 (Sonnenschein 2005, 117)
- b) b-en-**tek-dxgw**=a' lizh=a'
 COMPL-make-**more-emph**=1SG poss.house=1SG
 I really did build my houses
 (Sonnenschein 2005, 117)
- c) b-edey-ey-os-ban-**tont-tek**=e=nda'
 COMPL-VEN-FREQ-CAU-live-**foolish-really**=3F=1SG
 'He keeps on coming and causing me to foolishly wake up'
 (Sonnenschein 2005, 118)

Since the adverbial modifiers in in Zapotec (Northern) are realized as suffixes, the verb can be assumed to have moved to a position above the adverb. This could be the result of either head movement to the adverb where the two are merged, or via phrasal movement to a position above the head of the adverb phrase. Regardless of which analysis is accurate for Zapotec (Northern), the pattern found here diverges somewhat from languages with adverbial modifiers realized as verbal affixes, since they are suffixes in Zapotec (Northern).

Nuuchahnulth diverges from the patterns discussed above. Nuuchahnulth has what Wojdak (2008) calls *affixal predicates*, which can be described as bound verbs that cannot appear by themselves, but that must attach as a suffix to another constituent. These are attached to the first constituent in the clause, although this appears to be limited to heads. These can attach to nouns, verbs, adjectives and adverbs. As lower adverbs in Nuuchahnulth must be placed before the main verb of a clause, they must be the host of affixal predicates, if both are present. This is illustrated in (51a) and (51b), where the sentence is rendered ungrammatical if the affixal predicate is realized as a suffix on the main verb rather than the adverb (Wojdak 2008). The situation is different for other adverbs, as their position is more flexible in Nuuchahnulth (Wojdak 2008). This is exemplified in (51c) and (51d), which illustrate that the affixal predicate can be realized as a suffix on both a verb and on an adverb.

In these two examples, the affixal predicate is in the matrix clause, while its host has raised from a complement clause. Interestingly, affixal predicates can also attach as suffixes to an attributive adjective, which is illustrated in (51e). It is not possible for the affixal predicate to attach to the noun in the same sentence, as it would render the sentence ungrammatical (51f). Finally, as an alternative to suffixing to another constituent, affixal predicates can be saved by inserting a *ʔu*, which it can attach to. Wojdak (2008) refers to this process as *ʔu*-support, which is illustrated in (51g).

51. Nuuchahnulth

- a) **hacuk-ʕiʕ-mit-siiš** waʔiç Ken
deeply-come.upon-PST-1SG.IND sleep Ken
 I came upon Kin in a deep sleep.
 (Wojdak 2008, 48)
- b) *waʔiç-ʕiʕ-mit-siiš **hacuk** Ken
 sleep-come.upon-PST-1SG.IND **deeply** Ken
 'I came upon Ken in a deep sleep'
 (Wojdak 2008, 49)
- c) **naʔiik-qaath-mit-siiš** waʕ-ʕiʕ ʔatquu wik-tum-sa
immediately-claim-PST-1SG.IND go.home-PERF although NEG-PST-1SG.DEP
 'I claimed I went home immediately, but I didn' t.'
 (Wojdak 2008, 48)
- d) waʕ-ʕiʕ-**qaath-mit-siiš** naʔiik ʔatquu wik-tum-sa
 go.home-PERF-**claim-PST-1SG.IND** **immediately** although NEG-PST-1SG.DEP
 'I claimed I went home immediately, but I didn' t.'
 (Wojdak 2008, 48)
- e) haʔum-**'iic-ʔiis-ʔaʔ** ʔaapinis
 tasty-**consume-3.IND-PL** apples
 'They are eating delicious apples'
 (Wojdak 2008, 3)
- f) *ʔaapinis-**'iic-ʔiis-ʔaʔ** haʔum
 apples-**consume-3.IND-PL** tasty
 are eating delicious apples'
 (Wojdak 2008, 3)
- g) **ʔu-cuk-ʔiis** ʕu-k^{wiʕ}-ʕat-quu qaawic-ʔii
 Ø-**need-3.IND** wash-PERF-PASS-3.COND potato-DET
 'It is best to wash the potatoes (liet: "it is necessary that the potatoes be washed")'
 (Wojdak 2008, 26)

Wojdak (2008) proposes an analysis for the derivation of clauses containing affixal predicates. This analysis is based on the assumption that there occurs a local spell-out every time a merge operation takes place, which according to Wojdak (2008) can accurately explain the structure found in sentences like the ones presented in 51

above. I refer the reader to Wojdak (2008) for further details concerning the underlying structure and derivations in Nuuchahnulth.

4.1.2. Adverbs as Matrix Predicates

A phenomenon reminiscent of adverbial verbs found in this study is adverbial modifiers that take an entire matrix clause as their complement. Unlike the more prototypical adverbial verbs discussed above, these do not appear in the same clause as a main verb, but instead takes a matrix clause as their complement, which in turn contains a main verb and its arguments. An example from Cebuano was presented above, and it is repeated in (52). Whereas the adverbial modifier takes verbal morphology in Cebuano (voice and tense, which are marked by portmanteau morphemes (Tanangkangsing (2009)), the other examples show adverbs without verbal morphology. They are then simply non-verbal predicates, taking a subordinate clause as their arguments. The adverbs functioning as predicates in the samples below are highlighted.

52. Cebuano

ma?ayo=kato-nga doctor, wa?=siya **mag-lisod** ug panganak
 good=that-LK doctor NEG=3S.NOM **AV-difficult** COMP give.birth
 'That doctor was good. She did not have difficulty giving birth.'
 (Tanangkangsing 2009, 281)

53. Amuzgo

a) **Tquiaxjeⁿ** na macaya jndaa.
infrequently COMP walk.PRS.1SG field
 'It is infrequently that I go to the field'
 (Buck 2015, 232)

b) **Cwe'ts'iaaⁿ'ndyo** na tjə l'aa; tjaa ljo' ljeiya.
in.vain COMP walk.PST errand; NEG anything find.PST.1SG
 'It was in vain that I went on the errand; I did not find anything.'
 (Buck 2015, 233)

54. Chatino

chev-la³¹ (cha⁷¹³) jy7ya²⁽⁺⁰⁾ tyoo^{o(r)} kya¹⁽⁺⁰⁾
perhaps COMP P.fall rain tomorrow
 "It is possible that it will rain tomorrow"
 (McIntosh 2011, 123)

4.1.3. Patterns from Nilo-Saharan Languages

Before moving on, a few comments ought to be made regarding some of the languages in the Nilo-Saharan group explored in this study. While it is true that

Maasai has rather prototypical adverbial, some of the other Nilo-Saharan languages included in this study have what appears to be adverbial verbs, but I argue that these are structurally different from the adverbial verbs discussed here. I begin with Turkana (Nilo-Saharan: Kenya).

As can be seen in the examples below, the adverbial modifiers follow the main verb, which runs contrary to the examples of adverbial verbs discussed above and the theoretical predictions made in this study. Furthermore, both of them are fully tensed (Dimmendale 1983), which also runs contrary to the examples given above. This would be the expected structure for head-final OV-languages, but this order of constituents ought not be possible in verb-initial languages or VO-languages (See 2.2.5. and 3.3.1. for discussions on this topic).

55. Turkana

- a) è-pès-e-tè è-ro-n-ò
 3-kick-A-PL **3-bad-SG-V**
 ‘they kick him badly’
 Turkana (Dimmendale 1983, 379)
- b) è-pès-e-tè kèci` è-ro-n-ò
 3-kick-A-PL them **3-bad-SG-V**
 ‘They kick them badly’
 Turkana (Dimmendale 1983, 365)
- c) η-i-igr è-mòdit-aa-n-à
 not-you-write **3-wrong-HAB-PL-V**
 ‘don’t write it down in a wrong way!’
 Turkana (Dimmendale 1983, 379)

I argue that these examples consist of a matrix clause with an embedded IP functioning as a modifier for the matrix clause. This is basically the same structure as found with English gerunds, as in "They sat in the kitchen, talking" or "They sat in the kitchen, drinking coffee". The only difference is that in the English examples, the modifier consists of a VP that lacks tense, while in Turkana it consists of an IP that contains both tense and aspect. The embedded verb can either be a stative/descriptive verb, as seen in 55 above, giving the appearance that these are adverbial verb, or dynamic verbs, as in 56 below. Square brackets were added for clarification. The sentence in 56a can either have *3-want-A-pl food* or *3-quiet-V-PL* as modifier.

56. Turkana

- a) è-à-ibòy-e-tè ña-kimàk ñi-ruà daàñi à na-rièt, [è-sàk-e-tè a-k-ìmuɟ/ è-ìmliliɟ-a-si]
 3-PA-stay-A-PL old women (N) day all of at-desert [3-want-A-PL food/ 3-quiet-V-PL]
 'the women stayed in the desert all day, [looking for food/quietly.]'
 (Dimmendale 1983, 380)
- b) è-ileleɓ-à ñi-kilyòk nà-mòtòkaa, [è-màa-sè ña-sigàra-i k-irwor-o-si]
 3-fill-V people (N) in-car [3-drink-PL cigarettes 3-talk-V-PL]
 'the car is full of people, [smoking cigarettes and talking]'
 (Dimmendale 1983, 380)

When the embedded verb is a dynamic verb, as in 56a and 56b, the English translation is given with a gerund for the modifying constituent. The true English equivalent of the sentences in 55 would be "They kick him, badding", "They kick them, badding" and "Don't write it down, wronging". I argue that this analysis can be extended to Ik (Nilo-Saharan: Uganda) and Krongo (Nilo-Saharan: Sudan) as well.

The differences between these languages are only the structure of the embedded IP. In Turkana it appears to be a full IP, while in Ik and Krongo, it is more reduced. In Krongo for instance, the embedded modifying verb does not have tense markings on its own, but is dependent upon the tense markings of the matrix verb (Reh 1985). However, it can take the imperfective aspect marker and it has its own argument structure. Furthermore, since the negation in (57a) has scope over the modifying constituent, it would appear that it is adjoined in a position below the negation. In (57a) and (57b), there are stative/descriptive verbs that occur in the embedded modifying phrases, while in (57c) and (57d) there are dynamic verbs in the embedded modifying phrases. The structure remains the same. These are also more transparently embedded, since the imperfective aspect marker restriction is typical of embedded verbs in Krongo (Reh 1984).

57. Krongo

- a) áɟ àʔàɟ n-ádúkwa úudà n-yúɟwá àʔàɟ é
 NEG 1SG C.1/2-IMPF.take meat C.1/2-IMPF.be.alone 1SG NEG
 'I did not take the meat alone'
 Krongo (Reh 1985, 345)
- b) Nk-áa áná (fùudó) kí-tiidò ñ-ótyó
 C.PL-COP INF.put (the earth) LOC-on.it C.M-be.little
 'And they sprinkle (the earth) a little.'
 Krongo (Reh 1985, 345)

- c) η -áa áricí ádiyà kítáccì-mày **ɲísò** **túkkúru kúbú**
 C.M-COP man INF.come there-REF **C.M-IMPF.run** **with.lowered.head**
 'The man came there running with (his) head lowered.'
 Krongo (Reh 1985, 345)
- d) η -úfùpó bábakóorà **ɲáaw** **kúdúkú àmàlɪŋ**
 C.M-IMPF.FQ.hear Jackal **C.M-IMPF.go** **together secretly**
 'The jackal eavesdropped on them, by walking with them in secret.'
 Krongo (Reh 1985, 345)

In Ik, the embedded modifying constituent is even more reduced, always taking the third person subject marker and the simultaneous aspect marker. It always follows the main verb. As in both Turkana and Krongo, both descriptive/stative verbs ((58a) and (58b)), as well as dynamic verbs (58c) occur in what I suggest is an embedded IP. Since the embedded verb is always marked in third person singular, one could speculate that there is a subject present (Ik is a pro-drop language (Schrock 2012)), which refers back to the event described in the matrix clause. Just like in Turkana above, dynamic verbs as modifying constituents are translated into English gerunds.

58. Ik

- a) t.d-i-a ic.-t.d-a [**gaan-i-k^e**]
 speak-1SG-REAL Ik-speech-NOM [**bad-3SG-SIML**]
 'I speak Ik badly (lit. 'I speak Ik, it being bad?')'
 (Schrock 2014, 449)
- b) wáák-úó [**maráŋ-á-k^e**]
 play-IMP.PL [**good-3SG-SIML**]
 'Play well' (lit. 'You play, it being well.')
- c) ka-a=n.a [**its.ɗ-á-k^e**]
 go-REAL=PST1 [**limp-3SG-SIML**]
 He went limping.
 (Schrock 2014, 509)

Interestingly, in Ik the clausal negation is a verb. According to Schrock (2014), it is a defective verb, as it only takes the third person singular agreement marker. However, it is clearly verbal since it occurs in the initial position of the clause, hosts agreement markers as well as realis and tense markers. The negation verb is the main predicate of the clause, with the lexical verbs and its arguments embedded in the clause. Since Ik is a pro-drop language (Schrock 2012), one can assume that the third person singular marker on the negation verb is referring to *pro*. A more literal translation of the sentence in (59) would then be 'It was not the case that I go'.

59. Ik

má-á=bee ŋk-a kó-í'
not[3SG]-REAL=PST2 I-NOM go-1SG[IRR]
I didn't go (yesterday).
(Schrock 2014, 553)

The two remaining Nilo-Saharan languages are Karamojong (Nilo-Saharan: Uganda, Novelli 1993) and Nandi (Nilo-Saharan: Kenya, Creider & Creider 1992). They both lack adverbial verbs. According to Novelli (1993), Karamojong has a large set of adverbs, in contrast to the other Nilo-Saharan languages examined in this paper, like Nandi (Creider & Creider 1992), Ik (Schrock 2014) and Maasai (Tucker and Pmaayei 1955). According to Creider & Creider (1992), Nandi has a very small set of adverbs, instead relying on embedded verbs to express what would otherwise be expressed by manner adverbs. Unfortunately, Creider & Creider (1992) provide no examples, but one could speculate that the structure of them would be similar to that of Krongo, Ik and Turkana, as discussed above. I leave this topic for future research.

4.1.4. *Patterns from Mayan Languages*

I finish this section by providing some noteworthy findings from the Mayan language family. Five Mayan languages, representing five of the six primary branches of the Mayan language family, were examined in this study and they exhibit some interesting patterns.

The structure found in Jacaltec (Mayan: Guatemala, Mexico) diverges from all of the other patterns found in this study. There are no manner adverbials in Jacaltec (Craig 1977). This function is instead fulfilled by adjectives and nouns, which can be used to encode the manner of which an event unfolds (Craig 1977). When these are used as manner adverbials, they are followed by what Craig (1977) refers to as *helping verbs of manner*. They are idiosyncratic verbs of the languages, *-eyi* being the stative one, and *-u* the active equivalent. They appear in the second position, directly following the adjective/noun function as manner adverbial. They are the finite predicate of the sentence, taking aspect markers (which is characteristic of the finite verb of a clause in Jacaltec). However, they are idiosyncratic in the sense that normally only verbs located in the initial position take aspect markers, otherwise they are located in a lower position in the clause and without aspect markers (Craig 1977). The lexical

verb is without aspect markers in sentences with manner adverbials. Craig (1977) claims that the initial adjective/noun and the helping verb of manner constitute the predicate of the clause, and that the lexical verb and its argument is an embedded clause, which functions as the subject of the aforementioned predicate. The helping verb is always marked for the impersonal third person (illustrated in (60a) and (60b)) (Craig 1977). Finally, these nouns and adjectives can function as predicates by themselves, in which case they get a different reading as predicatively used nouns and adjectives, rather than having an adverbial reading ((60c) and (60d)).

60. Jacaltec (My glossing)

- a) **c'ul** **x-(y)-u** ha-tzoteli
good **COMPL-(E3)-V** E2-talk
'you talked well'
(Craig 1977, 335)
- b) ***c'ul** **x-aw-u** ha-tzoteli
good **COMPL-2SG-V** E2-talk
'you talked well'
(Craig 1977, 335)
- c) **c'ul** cu cuyni abxubal
good 1.PL learn Jacaltec
'It is good that we learn Jacaltec'
(Craig 1977, 335)
- d) **c'ul** **ch-u** cu cuyni abxubal
good **INC-V** we learn Jacaltec
'we are learning Jacaltec well'
(Craig 1977, 335)

Itzaj (discussed above, see examples (8) and (32)) has both adverbial verbs and adverbial modifiers affixed onto the verb, as well as adverbs being realized as independent, non-verbal constituents. The same pattern was observed in Chol, which likewise has three different realizations of manner adverbs. (61a) contains a manner adverb as an independent adverbial. (61b) illustrates an adverbial modifier as a verbal prefix, while (61c) shows the same modifier in a reduplicated form. Finally, (61d) provides an example of an adverbial verb. On the other hand, Mam (Mayan: Guatemala, Mexico) and Tz'utujil (Mayan: Guatemala, Dayley 1985) only have non-verbal realizations of manner adverbials, prototypically located in the initial position. This is illustrated in (62) with an example from Mam. Finally, Jacaltec exhibits an idiosyncratic pattern not found anywhere else in this study. Thus, the Mayan languages provide some interesting implications for this study, both regarding the

variation of realization within a single language family, as well as illustrating that different structures can be available in a language synchronically.

61. Chol

- a) **oraj** mi i-jil-e
fast IMFV A3-finish-NF
 'It (the pozol) runs out fast.'
 (Alvarez 2011, 218)
- b) mi y-**ora**-jil-el
 IMFV A3-**fast**-finish- NF
 'It runs out fast.'
 (Alvarez 2011, 218)
- c) ?mi aw-**ora-oraj**-majl-el
 IMFV A2-**fast-RED**-go-NF
 'You go quickly.'
 (Alvarez 2011, 218)
- d) **ajñel**(-ø-ob)=bi tyi ju'b-i-y-ø-ob tyel
fast-B3-PL3=REP PERF go.down-IV-EP-B3-PL3 DIR:toward
 'It is said they come down really fast.'
 (Alvarez 2011, 368)

62. Mam

cheeb'a b'iincha-n-kub'-t-a q-mees
slowly make-IMP-DIR-2s-EMPH-2s 1PL-table
 'Make our table slowly!'
 (England 2011, 190)

4.2. Interrogative Verbs

In this section, I discuss and provide examples of the interrogative verbs found in this study. The structure of this section is similar to the previous one, in that I start out with more prototypical and transparent examples, only to move towards less prototypical and more opaque examples. I primarily focus on interrogative verbs encoding 'do.what', 'do.how' and 'do.why', as these are the ones presumed to be related to the adverbial verbs discussed in the previous section. Towards the end of this section, I also provide examples of interrogative verbs with other semantic content found in this study.

Just like in the previous section, I begin with Formosan languages, primarily due to the fact that they are fairly prototypical and transparent. (63a) provides an example of a main verb with voice morphology. Interrogative verbs in Puyuma take voice markers as well as subject clitics, as can be seen in (63b). These markers prototypically appear on verbs. In (63c) and (63d), they also take aspect markers.

kuda in Puyuma is a fairly prototypical interrogative verb in the sense that when it is the sole predicate of the sentence it means 'do.what' (63c), but when there is a lexical verb in the clause, it instead has a modifying function, meaning 'do.how' (63b). In (63d), a separate word meaning 'do.why' is presented. In (63) below, AV and ITR refer to the same morpheme in Puyuma and only reflect different analyses of the voice system by the two authors. I've kept the original transcriptions here, despite the fact that they represent different analyses.

63. Puyuma

- a) **m-ekan** dra kuraw i pilay.
AV-eat OBL fish NOM Pilay
 'Pilay eats fish.'
 (Li 2007, 3)
- b) **kuda-kuda=mu** Tungul?
<ITR>RED-how=2P.NOM <ITR>connect
 "How do you connect?"
 (Teng 2007, 348)
- c) **ka-kuda=ku=la** an kemaDu
RED-how=1S.NOM=PERF if such
 "If such things happen, what shall I do?"
 (Teng 2007, 348)
- d) **muama=yu=la** Dua kire<Tupu>Tupung-a
why=2S.NOM=PERF come <RED>meet.and.greet-PJ
 "Why did you come meet and greet?"
 (Teng 2007, 350)

As can be seen in (64) below, interrogative verbs in Kavalan are structurally very similar to those found in Puyuma, taking both voice inflection and subject clitics. Resembling Puymua, Kavalan utilizes the same word to encode both 'do.what' (64a) and 'do.how' (64b), its meaning being determined by the syntactic context in which it occurs. (64c) gives an example of a finite main verb.

64. Kavalan

- a) **q<um>uni=isu** tangi?
<AV>do.what=2SG.ABS just.now
 'What were you doing just now?'
 (Lin 2012, 192)
- b) **naquni-an-su** m-kala ya sunis a yau?
do.how-PV-2SG.ERG AV-find ABS child LK that
 'How do you find that child?'
 (Lin 2012, 194)

- c) **q<m>an=ti=iku** tu esi na babuy.
 <AV>eat=PFV=1SG.ABS OBL meat GEN pig
 'I have eaten pork.'
 (Lin 2012, 184)

Cebuano also has a fairly transparent interrogative verb. However, it differs somewhat from Puyuma and Kavalan, having a single interrogative verb whose meaning changes between do.what and do.how depending on which voice marker it has. In actor voice, it means 'do.what', and in patient voice, it means 'do.how'. According to Tanangkingsing (2009), it cannot appear with main verbs if it is in the actor voice, only with noun phrases, while the same word marked with patient voice can co-occur with main verbs. This is the case even if the voice of the clause would lead one to expect actor voice, as illustrated in (65c). The main verbs are always nominalized. Note that *unsa* is also the word meaning 'what' in Cebuano (Tanangkingsing 2009). In the examples below in (65), the interrogative is clearly verbal, considering the fact that it hosts the tense/voice morphology, which prototypically is marked on the verb in Cebuano (65d).

65. Cebuano

- a) oy adto=ta sa Chungshan sa wonwon
 VOC go=1IP.NOM LOC PN LOC PN
mag-unsa=man=ko diha?
 AV-do.what=PAR=1S.NOM there
 '(They'll tell me,) "Hey, let's go to Chungshan, to Wonwon." What am I supposed to do there?'
 (Tanangkingsing 2009, 248f)
- b) **gi-unsa=man=to** pag-ligis
 PFV.PV-what=PAR=that NMZ-bump.against
 ambot=lang (kung) **gi-unsa=kato** pagka-ligis
 don't.know=PAR COMP PFV.PV-what=that NMZ-bump.against
 wa?=ko ka-sabot wa?=ko ni-tan?aw ma-hadlok=ko
 NEG=1S.NOM AV-understand NEG=1S.NOM AV-see AV-be.afraid=1S.NOM
 L: 'How was it knocked down?'
 T: 'I have no idea how it was knocked down. I couldn't understand; I didn't look; I was afraid to look.'
 (Tanangkingsing 2009, 249)
- c) **unsa-on=man=nako?** pag-adto sa states
 what-PV=PAR=1S.GEN NMZ-go LOC US
 'How can I go to the States?'
 (Tanangkingsing 2009, 250)
- d) **gi-dala=ko** ni atty tangco, di?=gyud=ko **maka-tulog**
 PFV.PV-take=1S.NOM GEN PN NEG=EMPH=1S.NOM AV-sleep
 'Atty. Tangco took me (to the autopsy), I really couldn't sleep (after that).'
 (Tanangkingsing 2009, 86)

Makassar diverges somewhat from the pattern outlined above. There is an interrogative verb in Makassar (derived from *apa*, meaning 'what') that means 'do.what' when used as the sole predicate of the clause ((66a), (66b) and (66c)). When used in combination with main verbs, it means 'do.why' (66d). This is another prototypical use of interrogative words meaning 'do.what'. A complementiser can optionally appear between the interrogative verb and the main verb when they appear together.

66. Makassar

- a) **aN(N)–apa =ko?**
BV–what=2f
 What are you doing?
 (Jukes 2006, 355)
- b) **la=ku=apa=mo=ko**
FUT=1=what=PFV=2f
 What will I do with you now?
 (Jukes 2006, 355)
- c) **la=nu=apa=i** (a)ntu miong=a la=ku=pa–kanre=i
FUT=2f=what=3 that cat=DEF FUT=1=CAU–eat=3
 A: What are you going to do with that cat? B: I'm going to feed it.
 (Jukes 2006, 355)
- d) **aN(N)–apa** (na) nu=makkal=a'
BV–what (COMP) 2f=laugh=EC
 Why are you laughing?
 (Jukes 2006, 355)

Comox has separate words for 'do.how' and 'do.what'. The interrogative verb meaning do.what can occur on its own as an intransitive verb ((67a) and (67b)), as well as being used transitively (67c). When the word for 'do.how' co-occurs with a main verb, the main verb does not take any verbal morphology. This is illustrated in (67d), where it also is the possessum of the second person possessive pronoun. Finally, (67e) provides an example of a main verb used in isolation.

67. Comox (My glossing)

- a) **ta-tam-êx^w**
IMPF-do.what-2SG
 'What are you doing?'
 (Harris 1981, 145)
- b) **ta-tam** tom
IMPF-do.what Tom
 'What is Tom doing?'
 (Harris 1981, 145)

- c) **tam** t Λ q α la-t- Λ -s tom
do.what the work-3SG.OBJ-LINK-3SG.SUB PN
 'what is Tom working on?'
 (Harris 1981, 145)
- d) **c^vann Λ m-c \hat{x} ^w-s Λ m** kun so
how-2SG-FUT 2SG.POSS go
 'How are you going to go?'
 (Harris 1981, 145)
- e) taha-th-c \hat{w}
 feed-3SG.OBJ-2SG.SUB
 'You fed him'
 (Harris 1981, 59)

Resembling Comox, Bella Coola has two separate interrogative verbs for 'do.what' and 'do.how', respectively. The former is presented in (68a), while the latter is illustrated in (68b). Furthermore, verbal stems and other affixes can appear between the *-?iks* interrogative marker and the stem of the interrogative verb, the latter being illustrated in (68c). These interrogative verbs are clearly verbal, which is evident from the fact that they can host subject markers, which is characteristic of finite verbs in Bella Coola. This is illustrated in (68d).

68. Bella Coola (My glossing)

- a) **?alacix^w-ts-?iks**
do.what-1SG-INT
 'what have I done?'
 (Nater 1984, 116)
- b) **?a?^valacix^w-nu-?iks**
do.how-2SG-INT
 'How art thou doing?'
 (Nater 1984, 116)
- c) **?a?^valacix^w-liwa-nu-?iks**
do.how-SEM-2SG-INT
 'How are you feeling?'
 (Beck 1994, 20)
- d) **tx-is** ti- Λ msta-tx ti-qlix^w-tx x-ti-tq α -tx
cut-3SG D-person-D D-rope-D P-D-knife-D
 'The person cut the rope with the knife'
 (Beck 1994, 15)

Baure also has interrogative verbs, which are formed in quite an interesting way. There are separate words for 'do.what' and 'do.how'. They consist of a dummy verb (i.e. semantically empty verb root), which becomes nominalized via suffixation and then they take subject markers (Danielsen 2007). The interrogative verb meaning

'do.what' always appears by itself (69a). The interrogative verb for 'do.how' on the other hand, can occur both by itself in addition to in combination with main verbs, as exemplified in (69b) and (69c), respectively.

69. Baure

- a) **vi=kič i-no=niš** viti' ne'
1PL=say.do-NMZ1=EXCLA 1PL here
 'What shall we do here then?'
 (Danielsen 2007, 362)
- b) **vi=kie-toeri-no** te vi=amo-čo te vi=ač on
1PL=EV-do.how-NMZ1 DEM1m 1PL=take-NOM2 DEM2m 1PL=cargo
 'How will we take our cargo?'
 (Danielsen 2007, 363)
- c) **pi=kie-toeri-no** to čičorop
2SG=EV-do.how-NOM1 ART bean
 'How will you do (prepare) the beans?'
 (Danielsen 2007, 364)

Maori has two separate interrogative verbs for do.what and do.how. *aha* ('what') can be used as an interrogative pronoun and thus as an argument of a lexical verb (70a). It can also be used as a verb on its own, in which case it means 'do.what', as seen in (70b). This example is fairly opaque, due to the analytic nature of Maori morphology. However, the position of the interrogative verb in (70b), in between tense/aspect markers, which is a position prototypically occupied by the verb, implies that it is verbal. It can also take the passive marker, in which case it means 'happen.what' (70c). Finally, the word meaning 'do.how' can be used both alone (70d) and together with a main verb (70e). If it appears together with a main verb, the main verb is nominalized (70e).

70. Maori

- a) He **aha** kua mahue i te tamaiti?
 a **what** T/A leave behind cause the child
 'What has the child left behind?'
 (Bauer 1993, 8)
- b) E **aha** ana a Hata i te raakau raa
 T/A **what** T/A pers Hata DO the tree dist
 'What is Hata doing to that tree?'
 (Bauer 1993, 13)
- c) I **aha-tia** te tamaiti raa
 T/A **what-pass** the child dist
 'What happened to that child?'
 (Bauer 1993, 14)

- d) Ka **whaka-peehea** a Piri?
 T/A **cause-how** pers Bill
 'What about Bill?'
 (Bauer 1993, 233)
- e) I **pee-hea** te hoki-**nga** o Te Tahi i Whakaari?
 T/A **like-how** the return-**nom** gen Te Tahi from White Island
 'How did Te Tahi get back from White Island?'
 (Bauer 1993, 386)

Toba Batak constitutes an interesting example, since it appears to have two different kinds of interrogative verbs. One of them takes transitivity and aspect prefixes, which is a prototypical formal characteristic of verbs in Toba Batak. This word means 'do.what' and 'happen.what', depending on the prefix. Since it can take these prefixes, it clearly functions as a verb, as seen in (71a) and (71b). The other potential candidate for an interrogative verb (meaning 'do.how') is not as transparent. It occurs in the position before the predicate marker *ma* ('narrative'), which is the position reserved for predicates. This suggests that it is the predicate of the sentence. Furthermore, the lexical verb following this interrogative always takes a nominalized form, further suggesting that the interrogative is the predicate of the sentence. However, due to the lack of overt morphology, it is not possible to determine if *beha* ought to be regarded as an interrogative verb, or simply as a non-verbal interrogative predicate. Conversely, one could claim that the interrogative found in (71c-e) simply is more lexicalized, and that it no longer takes verbal affixes, although this is just speculation.

71. Toba Batak (My glossing)

- a) **mar-hua** ibana disi
INTR-do.what 3SG there
 'What is he doing there?'
 (Nababan 1981, 115)
- b) **ma-hua** ibàna
STA-happen.what 3SG
 'What happened to him?'
 (Percival 1981, 103)
- c) **beha** pam-baet-tu mang-alap ho
how NMZ-do-1SG AV-fetch 2SG
 what do I do to fetch you
 (Van Der Tuuk 1971, 177)
- d) **beha ma** pam-buat-tu di-baen na dapot au mijak na sa-botul i
how NARR NMZ-take-1SG PASS-do so obtain 1SG oil ATT one-bottle the
 'how should my way of taking be, so that that bottle of oil is obtained by me?'
 (Van der Tuuk 1971, 177)

- e) **beha ma** pa-boa na talu
how NARR NMZ-report ATT vanquished
 how is the vanquished to be reported on? (how is one to know who is the vanquished ?)
 (Van der Tuuk 1971, 177)

Lushootseed only has an interrogative verb meaning 'do.how', and no interrogative verb equivalent of 'do.what'. The interrogative meaning 'do.how' is clearly verbal, since it can take the stative aspect prefix. Furthermore, the main verb is nominalized and preceded by a determiner, providing further support for the claim that the interrogative is the verbal predicate of the clause in (72).

72. Lushootseed (My glossing)

ʔəs-čal-əx^w k^wi lu-s-huy-s
STA-how-COS D IRR-NMZ-manage-3.POSS
 'How will he manage?'
 (Beck 1994, 19)

Similarly, Krongo has one interrogative verb meaning 'do.why', but no interrogative verb meaning 'do.what'. This is clearly a verbal constituent, as indicated by the agreement marker, which can be masculine (73a), feminine as well as plural (73b) on the interrogative verb. What makes this interrogative verb of paramount importance is that Reh (1984) claims that it is (at the time Reh (1984) published her work) undergoing a process of reanalysis from an interrogative verb to an interrogative adverb. According to Reh (1984), said interrogative can also be used without agreement marking, which is illustrated in (73c) below. Different informants give different judgments, where some accept both forms, while others only accept the one without agreement markers (Reh 1984). Reh (1984) also claims that the corpus collected based on animal fables overwhelmingly contains more tokens of the word *áyá* without agreement markers. If the hypothesis presented by Reh (1984) is true, it could have very interesting implications, as it provides empirical evidence of an interrogative verb diachronically changing into an interrogative adverb.

73. Krongo

- a) **m-áyá** káaw m-àdiyà
F.IMPF-do.why person C.F-PRF.come
 'Why did the woman come?'
 (Reh 1984, 369)

- b) **k-áyá** àŋŋá nk-àdiyà
PL.IMPF-do.why 3SG.INC C.PL.PRF-come
 'Why did we come?'
 (Reh 1984, 369)
- c) **áyá** ù?ùŋ n-àdiyà kidá?à?
why 2SG C.1/2SG.PRF-come here
 'Why did you come here?'
 (Reh 1984, 369)

Sierra Popoluca has an interrogative verb that is derived via the versive suffix. This suffixed can be used to derive verbs from nouns and adjectives. They usually receive the meaning 'do N/Adj' or 'be N/Adj' (De Jong 2009). The interrogative verb presented in (74) means 'do.how', and co-occurs with a main verb, which is marked for dependency. Main verbs that occur with a finite auxiliary verb take this dependency marker (De Jong 2009), making it structurally similar to auxiliary verbs in the language.

74. Sierra Popoluca

juutz-?aH-W ?iny=?ix-W
be.such.that-VERS-CMP 2ERG=see-DEP
 'how is it you saw it?'
 (De Jong 2009, 633)

Cayuvava (Cayuvava: Bolivia) displays interesting features worthy of mentioning here. The language has a class of words described as verbal pronouns. These are words that are translated as pronouns, while they can function as pronouns, auxiliary verbs as well as the only verb element of an utterance (Key 1967). There are several subclasses of them, and they are all derived in similar ways, combining verbal roots with locatives, personal pronouns, etc. to form words expressing meanings like “it is I”, “this is hers” “we are here” and “for him” (Key 1967). A subgroup of these verbal pronouns is called verbal interrogatives. These appear to be composed of idiomatic, complex morphemes as bases, which can be suffixed with locatives and personal pronouns like other verbal pronouns to encode a wide range of interrogative meanings (Key 1967). These may constitute the only verb of a clause, or it might be combined with another dependent verb (Key 1967).

75. Cayuvava

nečečeibu če'apibe'bereče
why-are not-you-singular-running
'why are you not running?'
(Key 1967, 40)

4.2.1. Interrogative Verbs with Other Semantic Content

Before moving on to the next section, I first present some of the interrogative verbs with other semantic content than the once discussed above. Since these are not directly relevant to the hypotheses explored in this paper, they are given a peripheral role in this study. Nevertheless, some examples are presented below.

As mentioned above, Cayuvava has a fairly large set of interrogatives that function as verbs. A verb meaning 'be.who' is presented in (76) below. Additionally, Sierra Popoluca has an interrogative verb meaning be.what, which is presented (77). Furthermore, in Ik, there is an interrogative verb that means 'be.how many', which is fully conjugated, just like other verbs. It is illustrated in (78) below. It is the only interrogative verb found in this language.

76. Cayuvava

me'ačipe 'anihi 'asi
who-is this the-man
'who is this man?'
(Key 1967, 40)

77. Sierra Popoluca

tyih-ʔaH-pa-ʔpV?
what-VERS-INC-REL
'What is it?'
(De Jong 2009, 627)

78. Ik

a)	1SG	taná-í	'How many am I?'
b)	2SG	taná-id ^a	'How many are you?'
c)	3SG	taná	'How many is s/he/it?'
d)	1PL.EXC	taná-ít ^a	'How many are you (pl.)?'
e)	1PL.INC	taná-ím	'How many are we (exc.)?'
f)	2PL	taná-ísm	'How many are we (inc.)?'
g)	3PL	taná-át ^a	'How many are they?'

(Schrock 2014, 531)

Blackfoot has an interrogative verb expressing the meaning 'be.where'. It functions as the predicate of the sentence, in addition to taking the non-affirmative verbal suffix. The interrogative is derived from the demonstrative *ann* (see 79a). Krongo likewise

has an interrogative verb meaning be.where (80a), as well as an interrogative meaning be.how (80b).

79. Blackfoot

ann-waatsiksi Tsaani
that-3s.nonaffirm John
 ‘Where’s John?’
 (Frantz 1991, 137)

80. Krongo

- a) **n-iiyónŋ** tinkibí kàníŋ
N.IMPF-be.where goat 3SG.POSS
 ‘where is his goat?’
 (Reh 1984, 344)
- b) **áfáapà** shay
M.IMPF.be.how tea
 ‘how is the tea?’
 (Reh 1984, 369)

The semantic content of interrogative verbs in Formosan languages is very diverse. It includes put.where (81a), take.where (81b), do.how.many (81c), do.how.much (81d) and do.how.many.times (81e), in addition to go.where (81a).

81. Amis

- a) **Icuwa-en=tu** isu ku paysu?
(put).where-PV=PFV 2SG.ERG ABS money
 ‘Where did you put the money?’
 Lin (2012, 188)
- b) **Talacuwa-en=tu** ni Panay ku-ra wawa?
(take).to.where-PV=PFV ERG PN ABS-that child
 ‘Where did Panay take the child?’
 Lin (2012, 188)
- c) **Pina-en** ni Ofad mi-pacuk ku fafuy?
(do).how.many-PV ERG PN AV-kill ABS pig
 ‘How many pigs does Ofad kill?’
 Lin (2012, 188)
- d) **Hakuwa-en** isu mi-falah ku lakaw?
(do).how.much-PV 2SG.ERG AV-throw ABS garbage
 ‘How much garbage do you throw away?’
 Lin (2012, 188)
- e) **Kina-pina-en** nu wacu mi-kalat ku pusi?
times-(do).how.many-PV ERG dog AV-bite ABS cat
 ‘How many times does the dog bite the cat?’
 Lin (2012, 188)

82. Kavalan

quni=pa=isu?
go.where=FUT=2SG.ABS
'Where are you going?'
Lin (2012, 192)

In this and the previous section, I outlined the distribution and properties of adverbial verbs and interrogative verbs, respectively. In the next section, I will discuss the distribution of the adverbial verbs and interrogative verbs in relation to each other.

4.3. Distribution of Adverbial Verbs and Interrogative Verbs

In this section I discuss the distribution of adverbial verbs and interrogative verbs in the languages that were examined in this paper. This includes examining how many and which languages that have interrogative verbs and adverbial verbs, respectively, as well as whether or not there is any significant overlap between the two. If there is a positive correlation between the presences of the two in verb-initial languages, as suggested by the hypothesis of this paper, this ought to be visible in their distributions.

Furthermore, in this section I compare the morphosyntactic properties of adverbial verbs and interrogative verbs in languages that possess both of them. Provided that they are truly associated with each other, one can expect them to have similar formal properties if they occur in the same language. This line of reasoning is also explored in this section.

This section is structured as follows: I first present some examples that corroborate the hypotheses outlined here, that is, languages with both adverbial verbs and interrogative verbs that are also structurally similar. Secondly, I present examples of languages that have both features, but where they are structurally rather different, which would imply that these are not as intimately connected as originally postulated. Thirdly, I provide examples from languages that have adverbial verbs but lack interrogative verbs, or vice versa. These also challenge the hypotheses of this paper. Finally, I conclude this section by giving a description of the general distribution of adverbial verbs and interrogative verbs in the languages I examined in this paper.

Since the different adverbial verbs and interrogative verbs found in this study already have been examined above, several examples are reiterated from the previous two sections. Additional data is also included. Since most examples were discussed in the previous two sections, the examples are not discussed in the same detail here.

In Puyuma and Kavalan, the structural similarities between adverbial and interrogative verbs are striking. In both languages, the adverbial verbs and the interrogative verbs appear in the clause initial position, take voice morphology and subject clitics.

83. Kavalan

- a) **naquni-an-su** m-kala ya sunis a yau?
do.how-PV-2SG.ERG AV-find ABS child LK that
‘How do you find that child?’
(Lin 2012, 194)
- b) **paqanas-an-ku-pa** pasaqay ya qRitun
slow-PF-1S.GEN-FUT drive[AF] NOM car
‘I will drive my car slowly’
(Chang 2006, 48)

84. Puyuma

- a) **ku=patawar-ay** m-aip na trilin.
1SG.GEN=slowly-LV AV-read NOM book
‘I read the book slowly.’
(Li 2007, 5)
- b) **kuda-kuda=mu** Tungul?
<ITR>**RED-how=2P.NOM** <ITR>connect
‘How do you connect?’
(Teng 2007, 348)

Sierra Popoluca has interrogative verbs and adverbial verbs that are structurally very similar. They both occur in the clause initial predicate position, both take aspect morphology and the lexical verb of the clause takes a dependency marker. Interestingly, De Jong (2009) classifies both as auxiliary verbs.

85. Sierra Popoluca

- a) **juutz-?aH-W** ?iny=?ix-W
be.such.that-VERS-CMP 2ERG=see-DEP
‘how is it you saw it?’
(De Jong 2009, 633)

- b) ?ii ?anh-jak-?o?y-pa ?i-ká?-W
 and **be.first-ANTIP-INC** 3ERG=die-DEP
 '...and he'll die first'
 (De Jong 2009, 357)

Interrogative and adverbial verbs in Cebuano likewise have a very similar structure, in that both can host voice/tense morphology and subject clitics. A difference is that the main verbs that co-occur with interrogative verbs become nominalized, unlike the ones that co-occur with adverbial verbs.

86. Cebuano

- a) **Usab-on=nako?** ug buhat
Again-PV=1S.GEN LK do
 'I will do it again'
 (Tanangkingsing 2009, 291)
- b) wala?=siya **nag-lisod,** kay ma?ayo iya-nga doctor
 NEG=3S.NOM **AV-difficult** because good 3S.POSS-LK doctor
 'She didn't have a hard time (giving birth) because her doctor was good.'
 (Tanangkingsing 2009, 273)
- c) **unsa-on=man=nako?** pag-adto sa states
what-PV=PAR=1S.GEN NMZ-go LOC US
 'How can I go to the States?'
 (Tanangkingsing 2009, 250)

Adverbial and interrogative verbs in Maori are quite similar. Both occur in the position immediately following tense/aspect markers, however, only the interrogative verbs can take passive and causative markers. Furthermore, main verbs that co-occur with interrogative verbs are nominalized, unlike those that co-occur with adverbial verbs.

87. Maori

- a) Ka **aahua** pukuriri a Tamahae ki a Rewi
 T/A **somewhat** angry pers Tamahae to pers Rewi
 'Tamahae was somewhat angry with Rewi' (TR2, 5)
 (Bauer 1993, 92)
- b) I **aha-tia** te tamaiti raa
 T/A **what-PASS** the child dist
 'What happened to that child?'
 (Bauer 1993, 14)
- c) Ka **whaka-peehea** a Piri?
 T/A **CAU-how** pers Bill
 'what about bill?'
 (Bauer 1993, 233)

that lacks adverbial verbs. The latter has simply been lost in the language (or in one of its ancestral languages). The same can be said about Kadazan, which has adverbial verbs but lacks interrogative verbs (Antonissen 1958, 18). Likewise, Palauan has an interrogative verb 'do.what' (Joseph 1975, 426), but lacks adverbial verbs. Palauan might be a problematic example though, as different analyses have been presented for the basic constituent order of the language, either VOS or SVO (see Joseph (1975) for a discussion). However, the argument based on structural differences also receives support from outside the Austronesian language family, as illustrated in Baure below.

It can be argued that Baure has adverbial verbs on the basis that there are adverbs that take the change of state suffix as well as host argument clitics, properties that are typical of predicates in Baure. Thus, a fairly strong claim can be made that Baure has adverbial verbs. However, the interrogative verbs found in Baure are very different from the adverbial verbs. The derivation of the interrogative verbs in Baure is interesting, where a dummy verb (i.e. semantically empty verb root is nominalized, only to take subject clitics and then become an interrogative verb (Danielsen 2007). Furthermore, the lexical verbs that co-occur with interrogative verbs are nominalized. This is not the case for adverbial verbs. Thus, languages like Baure challenge the claim that there is a strong structural link between adverbial and interrogative verbs.

89. Baure

- a) herik vero-**wapa=ro** ver ro=im
 maybe already-COS=3SGm PERF 3SGm=be.cooked
 'Maybe it (the food) is already ready, it is already cooked.'
 (Danielsen 2007, 107)
- b) noka heno-**wapa** nik koeč mavi-wapa=ni
 NEG good-COS 1SG.eat because sick-COS=1SG
 'I cannot eat well any more, because I am very sick.'
 (Danielsen 2007, 179)
- c) **vi=kič i-no=niš** viti' ne'
 1PL=say.do-NOM1=EXCLA 1PL here
 'What shall we do here then?'
 (Danielsen 2007, 362)
- d) **vi=kie-toeri-no** te vi=amo-čo te vi=ač on
 1PL=EV-do.how-NOM1 DEM1m 1PL=take-NOM2 DEM2m 1PL=cargo
 'How will we take our cargo?'
 (Danielsen 2007, 363)

95. Itzaj

chich-aj-ij u-b'et-ik
hard-CIS-3SG.B 3A-do-ITS
 's/he had to do it hard, quickly'
 (Hofling 2000, 47)

In this study, 60 languages from 43 genera were examined. Out of these 60, 22 languages have interrogative verbs of semantic content relevant for this paper ('do.what', 'do.how' and 'do.why'). 24 out of these 60 languages have adverbial verbs. These do not include languages with adverbs that function as non-verbal predicates with a subordinate clause as its only argument. If one were to cross-reference these, 15 of these 60 languages have both adverbial verbs and interrogative verbs. Nine languages were found with adverbial modifiers realized as verbal suffixes, 3 of which also have adverbial verbs. This makes for a total of 30 languages with adverbial modifiers overtly realized as heads. Details about the distribution of interrogative verbs and adverbial verbs in the language sample are presented in Tables 2, 3 and 4 below. The geographical distribution of adverbial verbs and interrogative verbs are presented in Figure 5 and Figure 6 below.

Table 2 Distribution of interrogative verbs (int) and adverbial verbs (adv) in relation to each other

	S. E. Asia and Oceania		Eurasia		Africa		North America		South America		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
+Adv +Int	11	18					2	3	2	3	15	25
+Adv -Int	1	2			3	5	3	5	2	3	9	15
-Adv +Int	2	3			1	2	2	3	2	3	7	12
-Adv -Int	1	2	1	2	8	13	3	5	16	27	29	48
Total	15	25	1	2	12	20	10	17	22	37	60	100

Table 3 Distribution of interrogative verbs (Int) and adverbial verbs (Adv) independent of each other

	S. E. Asia and Oceania		Eurasia		Africa		North America		South America		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
+Int	13	22			1	2	4	7	4	7	22	37
+Adv	12	20			3	5	5	8	4	7	24	40

Table 4 Distribution of interrogative verbs (IntV) and adverbial modifiers as heads (AdvH (adverbial verbs/adverbial modifiers as affixes))

	S. E. Asia and Oceania		Eurasia		Africa		North America		South America		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
+Int	13	22			1	2	4	7	4	7	22	37
+AdvH	12	20			3	5	8	13	7	12	30	50



Figure 5 Geographical distribution of languages with adverbial modifiers as heads (Original map taken From Wikipedia Commons)

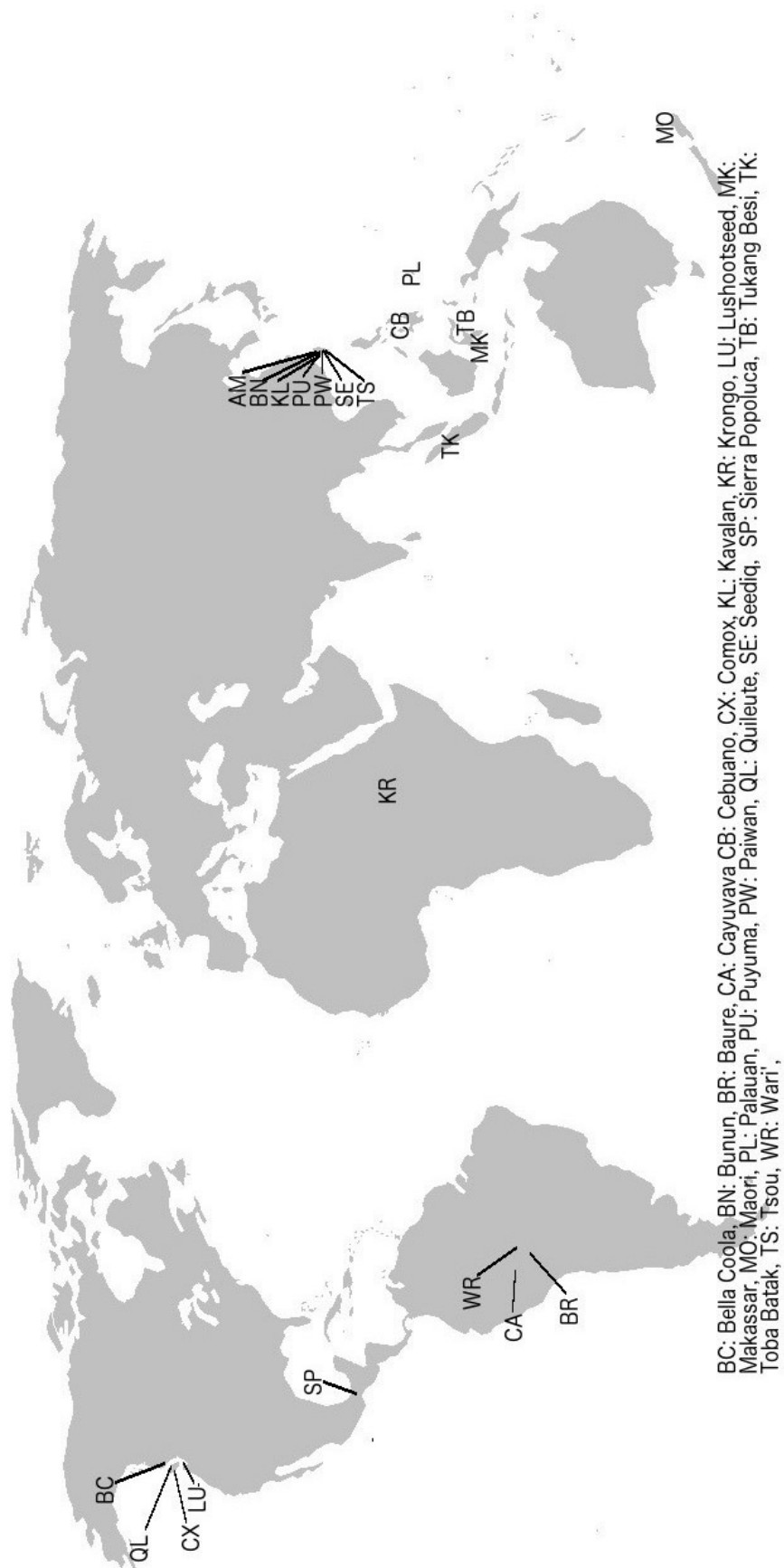


Figure 6 Geographical distribution of languages with interrogative verbs (Original map taken from Wikipedia Commons)

4.4. Non-Verb-Initial Languages

Before moving on to the discussion, I present some findings from non-verb-initial languages that have been claimed to have adverbial verbs. Atkan Aleut (Eskimo-Aleut: Canada, SOV), Chichimeco-Jonaz (Oto-Manguean: Mexico, SOV), Yoruba (Niger-Congo: Nigeria, SVO) and Ibibio (Niger-Congo: Nigeria, SVO) were examined, and they all have adverbial verbs. Below follows a brief account of Chichimeco-Jonaz and Atkan Aleut.

In Atkan Aleut, adverbial verbs only encode temporal information. They follow the main verb of the clause. They are the finite predicate of the clause and are marked for subject agreement and tense, if the latter is overtly marked. The main verb is in the conjunctive, which also functions as an infinitive marker (Bergsland & Dirks 1981). (96a) and (96b) provide examples. Since Atkan Aleut is a head-final language, this is also the predicted order of the constituents. Interestingly, the order of the constituents is sometimes variable, where either the main verb or the adverbial can function as the finite predicate of the clause. This phenomenon is illustrated in (96c) and (96d), where either the main verb *waaka* 'arrive' or the adverbial element *qilaχ* 'morning' can be realized as the finite verb of the clause. This is the same pattern found in Nuuchahnulth. However, the order is the reverse to that of Nuuchahnulth, which is expected considering the fact that Atkan Aleut is a head-final language.

96. Atkan Aleut

- a) hama-ng awa-l **sluχ-ku-q**
 that-LOC work-CNJ **summer-PRS-1SG**
'I passed the summer working there'/I worked there in the summer
(Bergsland & Dirks 1981, 59)
- b) waaka-l **havit-na-χ**
 arrive-CNJ **few.days.ago-PST-3SG**
'He came back the other day'
(Bergsland & Dirks 1981, 60)
- c) wan qilaχ **waaka-ku-q**
 this morning **arrive-PRS-1SG**
'I came back this morning'
(Bergsland & Dirks 1981, 60)
- d) waaka-l **qilaχ-χsi-q**
 arrive-CNJ **morning-CAU-1SG**
'I came back this morning'
(Bergsland & Dirks 198, 60)

Atkan Aleut also has an interrogative verbs meaning 'do.what'. When it is used together with main verbs, it instead means 'do.why/do.how'. It precedes the main verb, although Atkan Aleut does not have wh-movement. Unlike all the verb-initial languages examined here, when the interrogative verb co-occurs with main verbs, the interrogative verb is non-finite, while the main verbs become finite predicates.

97. Atkan Aleut

- a) **alqu-χt**
 do.what-2SG
 'what are you doing?'
 (Bergsland & Dirks 1981, 45)
- b) **alqu-l** haqa-na-χulaχ-χt
 do.what-CNJ come-PST-NEG-2SG
 why (how come) didn't you come?
 (Bergsland & Dirks 1981, 45)

Chichimeco-Jonaz has adverbial verbs that encode both temporal and manner information. These are marked for tense and subject agreement, which are realized as portmanteau morphemes in Chichimeco-Jonaz. Both adverbial verbs and main verbs are marked for tense and agreement when they occur together. The same is true for auxiliary verbs in Chichimeco-Jonaz. Interestingly, adverbial verbs (and auxiliary verbs) precede main verbs, even though this is a verb-final language. However, Chichimeco-Jonaz is not consistently head-final as many other verb-final languages and it exhibits many head-initial patterns. For instance, tense markers are prefixes, modifying nouns follow the nouns that they modify, attributive adjectives follow nouns and relative clauses follow the nouns that they modify (De Suarez 1984). It is therefore not surprising that auxiliary verbs and adverbial verbs can appear before the main verb. This kind of pattern was predicted based on Julien's (2003) claim that there are two kinds of OV-languages in terms of IP-structure (see 3.3.1. for a discussion). (98a) and (98b) show how auxiliary verbs precede main verbs, while 98c and (98d) provide two examples of adverbial verbs.

98. Chichimeco-Jonaz

- a) cúcé sa **é-məʔəʔ** úra é-təŋ
 José already **3SUB.PRS-be** 3POSS.work 3SUB.PRS-work
 'Jose is already working'
 (Lastra 2016, 112)

- b) **ú-tho** úran? ú-ran?
3SUB.PST-finish 3POSS.work 3SUB.PST-work
'S/he finished work'
(Lastra 2016, 49)
- c) ígo? **i-ʔüç** ríkhur é-t̥h̥i-kʔ-os
3PL **3SUB.PRS-always** tortilla 3SUB.PRS-ask-2OBJ-PL
'They always ask you for tortillas'
(Lastra 2016, 110)
- d) **su-áb** kí-tʔu
2SUB.PRS-slowly 2SUB.PRS-walk
'You walk slowly'
(De Suarez 1984, 40)

5. Discussion

The results of this study are discussed in this chapter. I begin by examining the hypothesis claiming that there is a positive correlation between adverbial verbs and interrogative verbs in verb-initial languages in 5.1. I then move on to discuss whether or not adverbial verbs and interrogative verbs develop via analogy to one another in 5.2. The connection between adverbial verbs and verb-initial constituent order is discussed in 5.3., followed by a discussion on adverbial modifiers overtly realized as phrasal units and as heads in 5.4. 5.5. contains a discussion on the distribution of adverbial verbs and interrogative verbs in the language sample, followed by a discussion on the methodological framework in 5.6.

5.1. Correlation between Adverbial Verbs and Interrogative Verbs

One could compare the findings above to a random distribution of the examined features. Since the 60 languages were classified along two binary values, four possible combinations are possible, as illustrated in Table 8 above. Had the distribution been completely random, one would expect them to be evenly distributed along these four categories, with 15 languages (25%) in each. These values could then be compared to the results presented above. However, this line of reasoning is slightly erroneous, since it is based on the assumption that there is a 50% chance that any given language has adverbial verbs or interrogative verbs, respectively. While it is still unknown how common these features actually are among the languages of the world, it is reasonable to assume that they are rare, considering the fact that they are both understudied and are still relatively unrecognized linguistic categories. Therefore, it is plausible to assume that it is not a 50% chance whether or not a language has adverbial verbs/interrogative verbs and that such a comparison is best avoided here.

The first hypothesis of this paper states that there is a positive correlation between adverbial verbs and interrogative verbs in verb-initial languages. Since this was based on observations from Formosan languages and structural similarities between the two, languages with adverbial modifiers as affixes are excluded for now. Out of 22 languages with interrogative verbs, seven of them (32%) lack adverbial verbs, while 15 of them (68%) have adverbial verbs. It appears to be a rather strong correlation

between the presence of interrogative verbs and adverbial verbs. For languages with adverbial verbs (24 in total), nine of them lack interrogative verbs (37%), while 15 of them have interrogative verbs (63%). These results suggest that there indeed is a bidirectional correlation between adverbial verbs and interrogative verbs in verb-initial languages. However, I argue that this is the result of genetic biases in the sample rather than a linguistic universal.

Austronesian languages represent 25% of the languages examined in this paper, yet they constitute 73% of all languages with both adverbial and interrogative verbs (11 out of 15). They are clearly overrepresented in this group. If one were to exclude the Austronesian languages from this sample, a radically different picture emerges. Of the nine languages with interrogative verbs, four languages have adverbial verbs as well (44%), compared to five without adverbial verbs (56%). Furthermore, eight of the twelve languages with adverbial verbs lack interrogative verbs (67%), while four (33%) have both. If Austronesian languages were excluded from the sample, a language is more likely to only have one of the aforementioned features rather than both.

Based on these results, I conclude that the claim that there is a positive correlation between the presence interrogative verbs and adverbial verbs in verb initial-languages is false. This appears to be an Austronesian genetic feature, rather than a linguistic universal.

5.2. Adverbial Verbs and Interrogative Verbs Develop via Analogy

The second hypothesis of this paper is related to whether adverbial verbs develop via analogy from interrogative verbs in verb-initial languages, or vice versa. The results of this study shed no light upon this issue. Languages with adverbial verbs and without interrogative verbs as well as language without adverbial verbs but with interrogative verbs were found in this study. The scenario that a language first develops interrogative verbs, then adverbial verbs via analogy, only to lose the former is as plausible as the reverse order of events. According to the reverse account, a language would first develop adverbial verbs, and then develop interrogative verbs via analogy, only to lose the former. In light of the data found in this study, both scenarios are possible. Furthermore, there is no significant difference between the

number of languages with adverbial verbs that lack interrogative verbs and those that have interrogative verbs but lack adverbial verb.

Findings from Modern Standard Arabic and Krongo shed further light upon this question. Badawi et al. (2004) claim that while adverbial verbs are still productive in Modern Standard Arabic, they are less frequent than in Classical Arabic. Furthermore, Modern Standard Arabic has developed a productive morpheme that can derive adverbs, which presumably is related to the decline of adverbial verbs (Badawi et al. 2004). Similarly, Reh (1985) claims that the interrogative verb 'do.why' in Krongo is losing its verbal features and developing into an interrogative adverb meaning 'why'. These languages illustrate how adverbial verbs and interrogative can be lost diachronically. Unfortunately, Krongo does not have adverbial verbs and Modern Standard Arabic does not have interrogative verbs, which would have been even more illuminating for the hypotheses explored in this study.

The Austronesian language family casts even more light on this issue. All seven of the Formosan languages in this study have both interrogative verbs and adverbial verbs. Assuming that these are retentions and not areal features (Formosan languages are generally assumed to be conservative languages (Holmer 2012)), extra-Formosan languages (Austronesian languages spoken outside Taiwan) that lack either or both of the features can then be presumed to have lost them, rather than to have failed to develop them. Since languages with adverbial verbs and without interrogative verbs (Kadazan), and vice versa (Makassar, Palauan) were found, one could reasonably deduce that languages with both interrogative verbs and adverbial verbs can lose either of the two and still retain the other.

Another problem with the analogy argument for the development of adverbial verbs and interrogative verbs is the morphosyntactic discrepancies found between the two in some languages with both features. This was the case in both Bella Coola and Baure, where morphosyntactic properties of adverbial verbs and interrogative verbs are significantly different. These structural differences are even more obvious in Atkan Aleut, where adverbial verbs are finite and follow non-finite main verbs, while the interrogative verb is non-finite and precedes finite main verbs. Furthermore, Atkan Aleut only has adverbial verbs encoding temporal information, while the interrogative

verb questions the manner of or cause behind a main verb, making it even more implausible that one of the two would have developed via analogy from the other.

It should be clarified that this study does not conclusively prove that it is not the case that adverbial verbs develop from interrogative verbs via analogy, or vice versa. It might be the case, but it must be investigated through in-depth diachronic studies since the results from this typological study are not sufficiently clear. It can be asserted, however, that it is not the case they necessarily develop via this analogy, as is shown by the structural differences between adverbial verbs and interrogative verbs in for instance Baure and Atkan Aleut.

5.3. Unidirectional Correlation from Adverbial Verbs to Verb-Initial Constituent Order

It was never the aim of this paper to test Holmer's (2012) conjecture that there is a unidirectional implication between having adverbial verbs and having verb-initial constituent order. Such an attempt would necessitate the inclusion of non-verb-initial languages in the sample as a standard of comparison to the frequency of which adverbial verbs are present in verb-initial languages. Instead, it was attempted to see whether or not adverbial verbs could be found throughout various languages families and geographical areas with verb-initial languages. 24 of out the 60 languages examined in this study have adverbial verbs. These were found in all the geographical areas, with the exception of Eurasia. However, the Austronesian languages of this study are overrepresented in this category, constituting 50% (12 languages) of all the languages with adverbial verbs, even though they only comprise 25% of the total sample. The high frequency of adverbial verbs in verb-initial Austronesian languages is more likely the expression of a genetic trait, rather than the result of a typological universal.

It cannot be claimed that adverbial verbs are more common in verb-initial languages than in for instance OV-languages, as there is no data available for the distribution of adverbial verbs in OV-languages. However, one could maintain that adverbial verbs are typologically rare, as is evident by the lack of research on the topic. Had adverbial verbs been typologically more common, it is reasonable to assume that they would have received more attention from linguistic research. It could therefore be speculated

that one would not be expected to find adverbial verbs in 40% (27% if Austronesian languages are excluded) of the languages from a random language sample. However, this is pure speculation. It could likewise be reasoned that the lack of research on adverbial verbs does not necessarily imply that they are typologically rare, only that they are relatively unrecognized as a linguistic category. It might very well be the case that adverbial verbs are more common than originally postulated, only that they have not received enough attention from typological research.

Holmer (2010, 2012) asserts that adverbial verbs are overrepresented in verb-initial languages. Under the assumption that adverbial verbs are typologically rare, which is not necessarily accurate but entirely plausible, it can be maintained that the results of this study corroborates the assertions of Holmer (2010, 2012). To date, only four known attested non-verb-initial languages have adverbial verbs. It is therefore reasonable to assume that in a study with a language sample of similar scope and genetic and geographic coverage, but that instead examined verb-medial or verb-final languages, fewer languages would have adverbial verbs.

Holmer (2012) claims that this correlation is unidirectional, implying that verb-initial word order does not imply the presence of adverbial verbs. This claim is corroborated by the results of this paper. Furthermore, empirical evidence has been presented showing that adverbial verbs are found in non-verb-initial languages as well. It can therefore be concluded that verb-initial word order is neither a sufficient nor a necessary prerequisite for adverbial verbs. However, it might be the case that a verb-initial constituent order facilitates the development of adverbial verbs. This conclusion was also maintained by Holmer (2012) and is corroborated by the results of this study.

5.4. Adverbial Modifiers as Phrasal Units and as Heads

Holmer (2012) argues that the underlying difference between languages with adverbial verbs and those without lies in the overt realization of adverbial modifiers. If they are overtly realized as heads in a given language, the language has adverbial verbs, if they are realized as phrasal units, the language does not have adverbial verbs. More empirical support was provided for this theoretical conjecture by expanding the empirical base upon which it was applied. All languages with adverbial verbs

examined in this study adhered to the predictions of said conjecture. Those that appeared to not conform to these predictions were shown to represent different syntactic constructions. This study thus corroborates the theoretical supposition assuming a parameterization of the phonological realization of adverbial modifiers as either heads or as phrasal units (Holmer 2012).

Moreover, this study expands upon the aforementioned theoretical conjecture by showing that adverbial modifiers that are verbal affixes are likewise overtly realized as heads. Thus, they share the same underlying structure with that of adverbial verbs. The distinction is therefore between languages with adverbial verbs and adverbial modifiers as verbal affixes, which are overtly realized as heads, and languages with manner and temporal adverbs, which are overtly realized as phrasal units. If the former two surface realizations are grouped into one category, they constitute 50% (30 languages) of this language sample. Since no previous research has been conducted on this topic previously, it is impossible to determine whether this correlation is somehow related to verb-initial constitute order or not. It can only be concluded that the theoretical conjecture receives empirical support from this study's results.

Furthermore, the data from Mayan languages discussed in 4.1.4. illustrates that both the head option and the phrase option in the parameterization of the phonological realization of adverbial modifiers can be available simultaneously in a language. Thus it is not necessarily an either or situation, where only one option is available for a given language synchronically, as was the case for most of the languages exemplified in this study.

5.5. Mapping the Distribution of Adverbial Verbs and Interrogative Verbs

As mentioned in the introduction, one of the major aims of this study was to map the distribution of adverbial verbs and interrogative verbs in verb initial languages. Since adverbial verbs have not been studied previously from a typological perspective, this is one of the major contributions of this study. The majority of the geographical areas and language families containing verb-initial languages were examined and the distribution of adverbial verbs was documented. It was thereby also shown that

adverbial verbs are a typologically valid category and not just a phenomenon unique to Austronesian languages.

Based on the results of this study, adverbial verbs are highly concentrated in the South East Asia and Oceania area, primarily due to their wide distribution in the Austronesian language family. Conversely, they are relatively rare in Africa, and even more so in South America. They enjoy a relatively wide distribution in the North American area. They are completely absent in Eurasia.

Regarding the semantic content of adverbial verbs, it is far more common for a language to have adverbial verbs that encode both temporal and manner information than just one of them. Out of the 24 languages with adverbial verbs, only two had adverbial verbs only encoding temporal information and 4 had adverbial verbs that only encode manner information.

Languages where adverbial modifiers are realized as verbal affixes were only found in North and South America. They were only found in highly synthetic languages, many of which belong to language families that have been classified as polysynthetic. It therefore is tempting to draw the conclusion that the realization of adverbial modifiers as verbal affixes is related to the morphological type of a language, rather than its unmarked constituent order.

Although Hagege (2008) had already conducted an exploratory typological study on interrogative verbs, this study builds upon his research by expanding the number of attested languages with interrogative verbs. Furthermore, while Hagege (2008) has already shown that interrogative verbs are a linguistic category, this study provides further empirical support for the postulation of interrogative verbs as a valid typological category. This is also an important contribution, considering the fact that this still is a largely unrecognized linguistic category. Moreover, evidence has been presented that the narrow definition employed by Hagege (2008) excludes important instances of interrogative verbs, such as the ones found in Maori and Cebuano.

Like adverbial verbs, interrogative verbs are highly concentrated in the South East Asian and Oceanic area, again because they enjoy such a wide distribution among

Austronesian languages. They are present in North America, Africa and South America, although they are relatively absent in the latter two. No verb-initial languages with interrogative verbs were located in Eurasia.

5.6. Method Discussion

The sample used for this typological study was a convenience sample. There are important genetic and geographical biases, which harm the external validity of this study. Due to these severe biases, and the limited sample of languages used, it is not plausible to extend the generalizations formulated here as linguistic universals. Instead, this study ought to be regarded more as an exploratory study, which then might serve as a stepping-stone for future research into these topics.

The definition and method for identifying interrogative verbs were primarily based upon Hagege's (2008) typological study, although a less narrow approach was employed here. Thus, it is difficult to directly compare the two results, as this study undoubtedly included several words as interrogative verbs, even though they would not be classified as such according to Hagege's (2008) definition. However, this is most likely the expression of the different theoretical frameworks employed.

While there had been some research into adverbial verbs on Formosan languages, no suggestions of a typologically valid methodology for identifying adverbial verbs had been formulated. The methodology and the definition were based on the data from the language sample of this study, in addition to the previous research conducted upon Formosan languages. While I argue here that the methodology and the definition are accurate and valid, the language sample upon which they have been used is relatively small, and studies on larger samples might show that they have to be revised in the future.

On a similar note, it might be the case that several instances of adverbial verbs and interrogative verbs were missed or categorized incorrectly, as might be the case for all typological studies. However, it might be an especially serious problem for this study. This is the case since it investigated two linguistic categories that have not received much attention from linguistic research and are relatively unrecognized. Adverbial verbs and interrogative verbs are therefore very rarely explicitly mentioned in

grammatical descriptions. In order to minimize the risk of inaccurately classifying the languages in this study's sample, I developed the method for locating adverbial verbs and interrogative verbs that was outlined in the methodological framework of this paper.

6. Concluding Remarks

The concluding remarks of this study are presented in this chapter. A summary of the results and conclusions are presented in 6.1., while suggestions for future research are discussed in 6.2.

6.1. Summary

This exploratory typological study examined the distribution and properties of adverbial verbs, interrogative verbs and adverbial modifiers realized as verbal affixes in 60 verb-initial languages from 43 different genera and five different geographical areas. It also proposed and tested the claims that adverbial verbs and interrogative verb tend to co-occur in verb initial languages and that adverbial verbs and interrogative verbs develop via analogy from one another. The empirical base for the claims that adverbial verbs are more frequent in verb-initial and that adverbial modifiers can be overtly realized as both phrases and heads was expanded in this study.

Based on the results of this study, it was concluded that there is no implicational universal entailing that adverbial verbs and interrogative verbs tend to co-occur in verb-initial languages. Instead, this pattern was concluded to be an Austronesian genetic feature, rather than a linguistic universal. Furthermore, no conclusive evidence was found suggesting that adverbial verbs develop via analogy from interrogative verbs, or that interrogative verbs develop via analogy from adverbial verbs.

This study showed that adverbial verbs are found in different verb-initial languages throughout genetically and geographically diverse sample. The theoretical claim that adverbial verbs are derived from overtly realized heads in functional projections was corroborated by the findings of this study. Furthermore, the results of this study showed that adverbial heads can be realized as either adverbial verbs or as verbal affixes in the surface structure.

Moreover, an attempt was made to develop a cross-linguistically valid definition of adverbial verbs and a new definition of interrogative verbs based on previous research

was developed. The list of attested languages with interrogative verbs was expanded upon and more data regarding interrogative verbs were presented in this study.

6.2. Suggestions for Future Research

An important point for future research is to proceed with the mapping and categorization of adverbial verbs and interrogative verbs. Both phenomena are still underexplored from a typological viewpoint and more research on both of them is therefore needed. An important question to investigate is whether or not adverbial verbs are more common in verb-initial languages than in verb-medial and verb-final languages. It could potentially constitute an important implicational universal related to adverbial verbs.

Another interesting topic for future research would be to investigate the distribution of adverbial verbs and interrogative verbs in extra-Formosan languages. Since adverbial verbs and interrogative verbs are presumed to be retentions in Formosan languages, it would be interesting to investigate if one could find any patterns related to the retention or loss of these features in extra-Formosan languages. If the presence of adverbial verbs is indeed related to a verb-initial constituent order, one would expect fewer non-verb-initial Austronesian languages to retain adverbial verbs, compared to verb-initial ones.

A more theoretically oriented issue is the derivation of interrogative verbs. While theoretical explanations for adverbial verbs have already been formulated and discussed, the underlying structure of interrogative verbs remains unexplored. Interrogative verbs can have important theoretical implications for formal grammar and its account of interrogatives and question formation.

The diachronic development of adverbial verbs and interrogative verbs are still poorly understood and therefore constitute important issues for linguistic research. However, these questions more likely belong to the realm of historical linguistics rather than linguistic typology or formal grammar.

Appendix 1

Abbreviations

1	First Person
2	Second Person
3	Third Person
-	Affix
=	Clitic
≡	Affixal Clitic
A	Ergative Subject Marker (Mayan)
A	Aspect Marker (Turkana)
ABS	Absolutive
AF	Actor Focus
AFF	Affirmative
AL	Allative
ALR	'already'
ANTIP	Antipassive Voice
AP	Antipassive Voice
APPL	Applicative
ART	Article
ATT	Attributive
AV	Actor Voice
B	Absolutive Subject Marker (Mayan)
B	Base (Northern Tepehuan)
BEN	Benefactive
BV	Bivalent
CAU	Causative
C	Connector
CIS	Completive Intransitive Status
CL	Classifier
CMP	Completive Aspect
CNG	Connegative
CNJ	Conjunctive
COMP	Complementizer
COMPL	Completive Aspect
COND	Conditional Mood
CONT	Continuous Aspect
COP	Copula
COR	Set I clitic
COS	Change of State
CUST	Customarily
D	Determiner
DAT	Dative
DIR	Directional
DIST	Distal Demonstrative
DEF	Definite
DEM1	Demonstrative 1
DEM2	Demonstrative 2
DEM3	Demonstrative 3
DEP	Dependent
DES	Desiderative

DET	Determiner
DIR	Directional
DO	Direct Object
DUB	Dubitative Mood
DUR	Durrative Aspect
E	Ergative
EC	Echo
EMPH	Emphatic
VC	(Epenthetic syllable)
EMPH	Emphatic
EP	Epenthesis
ERG	Ergative
EV	Empty Verb Root (Dummy Verb)
EXC	Exclusive
EXCLA	Exclamative
f	Feminine
f	Familiar (Makassar)
FAM	Familiar
FEM	Feminine
FREQ	Frequency
FQ	Frequentative
FUT	Future
GEN	Genitive
IIS	Incompletive Intransitive Status
IMFV	Imperfective aspect
IMP	Imperative
IMPF	Imperfect
IMPV	Imperfective
INAN	Inanimate
INC	Incompletive
INCEP	Inceptive
INCL	Inclusive
IND	Indicative
INDF	Indefinite
INDIC	Indicative Mood
INF	Infinite
INT	Interrogative
INTR	Intransitive
INTS	Intensifier
IPF	Imperfective
IRR	Irrealis
ITR	Intransitive
ITER	Iterative
ITS	Incompletive Transitive Status
IV	Status marker for intransitive verb in imperfective
JITTA	Second position clitic (Yagua)
LF	Locative Focus
LINK	Linking Vowel
LK	Linker
LOC	Locative

LV	Locative Voice
M	Masculine
m	Masculine
MV	Monovalent
MN	Nominalizer
N	Nominative
NARR	Narrative
NEG	Negation
NEUT	Neuter
NF	Non-Finite Suffix
NOM	Nominative
NONAFFIRM	Non-affirmative
NMZ	Nominalizer
OBJ	Object
OBL	Oblique
P	Proximal Instrumentative
P	Potential Aspect (Chatino)
PA	Past tense
PAR	Particle
part	Particle
PASS	Passive Voice
PERF	Perfective
pers	Personal Article
PF	Patient Focus
PFV	Perfective
PJ	Projective
PL	Plural
PN	Personal Name
POSS	Possessive Pronoun
PRS	Present tense
PRES	Present tense
PRET	Preterite
PRFV	Perfective
PROG	Progressive
PROX1	Proximate 1 tense
PROX2	Proximate 2 tense
PST	Past
PV	Patient Voice
Q	Interrogative Mood
QOUT	Qoutative Mood
RDP	Reduplication
REAL	Realis
RED	Reduplication
REF	Referential
REL	Relativizer
REP	Reportative
REP	Repetitive
SG	Singular
s	Singular
SEM	Semblative

SIML	Simultaneous Aspect
STA	Stative
SUB	Subject
SUBR	Subordinator
T/A	Tense/Aspect marker (Maori)
TEMP	Temporal Specifier
V	Verb
VEN	Venitive
VERS	Versive

Appendix 2
Language Sample

Language	Genus	Word order	Interrogative verbs	Adverbial verbs
South East Asia & Pacific				
Paiwan	<i>Paiwaic</i>	VSO/VOS	do.what, do.how, do.why	AdvV, Temporal & Manner
Puyuma	<i>Puyuma</i>	VOS	do.what, do.how, do.why	AdvV, Temporal & Manner
Bunun	<i>Bunun</i>	VSO	do.what, do.how, do.why	AdvV, Temporal & Manner
Tsou	<i>Tsou</i>	VOS	do.what, do.how, do.why	AdvV, Temporal & Manner
Seediq	<i>Atayalic</i>	VOS	do.what, do.how, do.why	AdvV, Temporal & Manner
Kavalan	<i>East Formosan</i>	VOS/VSO	do.what, do.how, do.why	AdvV, Temporal & Manner
Amis		VSO	do.what, do.how, do.why	AdvV, Temporal & Manner
Cebuano	<i>Greater Central Philippine</i>	VSO	do.what, do.how, do.why	AdvV, Temporal & Manner
Maori	<i>Oceanic</i>	VSO	do.what, do.how, do.why	AdvV, Temporal & Manner
Toba Batak	<i>Northwest Sumatera- Barrier Islands</i>	VOS	do.what, do.how, do.why	AdvV, Temporal & Manner
Tukang Besi	<i>Celebic</i>	VSO	do.what, do.how, do.why	AdvV, Temporal & Manner
Kadazan	<i>North Boreno</i>	VSO	N/A	Manner
Malagasy	<i>Barito</i>	VOS	N/A	N/A
Makassar	<i>South Sulawesi</i>	VSO	do.what, do.why do.what,	N/A
Palauan	<i>Palauan</i>	VOS/SVO	do.how, do.why	N/A
Euroasia				
Gaelic (Scots)	<i>Celtic</i>	VSO	N/A	N/A
Africa				
Hdi	<i>Biu-Mandara</i>	VSO	N/A	N/A
Gude			N/A	N/A
Awjila	<i>Berber</i>	VSO	N/A	N/A
Tamazight			N/A	N/A
Hebrew (modern)	<i>Semitic</i>	VSO/SVO	N/A	AdvV, Temporal & Manner
Arabic (modern standard)		VSO/SVO	N/A	AdvV, Temporal & Manner
Maasai	<i>Nilotic</i>	VSO	N/A	AdvV, Temporal & Manner
Karimojong		VSO	N/A	N/A
Turkana		VSO	N/A	N/A
Nandi		VSO	N/A	N/A
Ik	<i>Kuliak</i>	VSO	N/A	N/A
Krongo	<i>Kadugli</i>	VSO	do.why	N/A

Language	Genus	Word order	Interrogative verbs	Adverbial verbs
North America				
Nuuchahnulth	<i>Southern Wakashan</i>	VSO/VOS	N/A	Incorporated & AdvV, Temporal & Manner
Blackfoot	<i>Algic</i>	VSO/VOS	N/A	Incorporated, Manner AdvV, Temporal & Manner
Bella Coola	<i>Bella Coola</i>	VSO	do.what, do.how	Manner
Lushootseed	<i>Central Salish</i>	VSO	do.how	N/A
Comox		VSO	do.what, do.how	AdvV, Manner
Shuswap	<i>Interior Salish</i>	VSO	N/A	AdvV, Manner
Quileute	<i>Chimakuan</i>	VSO	do.what, do.why	Incorporated, Manner
Huasteca				
Nahuatl	<i>Aztecán</i>	VSO	N/A	Incorporated, Manner
Tepehuan (Northern)	<i>Tepiman</i>	VSO	N/A	AdvV, Temporal
O'odham (Papago)		VSO	N/A	N/A
South American				
Wari'	<i>Chapacura-Wanham</i>	VOS	do.what	Incorporated, Manner
Yagua	<i>Peba-Yaguan</i>	VSO	N/A	N/A
Cayuvava	<i>Cayuvava</i>	VOS	do.what, do.how, do.why	N/A
Baure	<i>Bolivia-Parana</i>	VOS	do.how, do.what	AdvV, Manner & Temporal
Guajajara	<i>Tupi Guarani</i>	VSO	N/A	N/A
Huave	<i>Huavean</i>	VOS/SVO	N/A	N/A
Totonac (Misantala)	<i>Totonacan</i>	VSO/SVO	N/A	N/A
Tepehua		VSO/SVO	N/A	N/A
Totonac (Upper Necaxa)		VSO/SVO	N/A	Incorporated, Manner
Sierra Popoluca	<i>Zoque</i>	VSO/VOS	do.how	AdvV, Temporal
Jacaltepec	<i>Mayan</i>	VSO	N/A	N/A
Chol		VOS	N/A	AdvV & Incorporated, Manner
Itzaj/Itzá		VOS	N/A	AdvV & Incorporated, Manner
Mam		VSO	N/A	N/A
Tz'utujil		VOS	N/A	N/A
Chalcatongo (Mixtec)	<i>Mixtecán</i>	VSO	N/A	N/A
Jicaltepec (Mixtec)		VSO	N/A	N/A
Chatino (Teotepic)	<i>Zapotecán</i>	VSO	N/A	N/A
Zapotec (Northern, Zoogocho)		VSO	N/A	Incorporated, Manner
Otomi (Mezquital)	<i>Otomian</i>	VSO	N/A	N/A
Amuzgo	<i>Amuzgoan</i>	VSO	N/A	N/A
Chinantec (Sochiapan)	<i>Chinantecán</i>	VSO	N/A	N/A

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