

11 *The syntactic derivations of interrogative verbs in Amis and Kavalan*^{*}

DONG-YI LIN

1 Introduction

1.1 Interrogative verbs in Amis and Kavalan

Despite the large number of studies on interrogative words and sentences, the possibility that interrogative words can be used as verbs, or interrogative verbs, is still not well known to most linguists. Hagège (2008:3) defines an interrogative verb as “a kind of word which both functions as predicates and questions the semantic content of this predicate”. His typological study has revealed the morphological, syntactic, and semantic properties that interrogative verbs share cross-linguistically.

L. Huang et al.’s (1999) study on the interrogative constructions in Formosan languages argues that in addition to nominal and adverbial interrogative words, certain interrogative words in Formosan languages can be used as verbs and exhibit the same morphosyntactic properties as verbal predicates. Lin (2012) shows that interrogative verbs exist indeed in Amis but also in Kavalan—another Formosan language not discussed in the above-mentioned study—in that they have the same morphosyntactic distribution as verbs. Like other verbs, interrogative verbs in the two languages occur in

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the sentence-initial position, take tense/aspect markers, attract pronominal clitics, and are affixed with voice markers. The following sentences are for illustration.¹

(1) Amis (Lin 2012:187)

- a. *mi-maan ci panay?*
 AV-do.what NCM PN
 ‘What is Panay doing?’

- b. *na maan-en isu k-u-ra wacu?*
 PST do.what-PV 2SG.ERG ABS-CN-that dog
 ‘What did you do to that dog?’

(2) Kavalan

- a. *q<um>uni=isu tangi?*
 <AV>do.what=2SG.ABS just.now
 ‘What were you doing just now?’ (Lin 2012:186)

- b. *quni-an na wasu ya saku ’nay?*
 do.what-PV ERG dog ABS cat that
 ‘What does the dog do to that cat?’ (Lin 2012:192)

- c. *quni-an-su m-kala ya sunis a yau?*
 do.how-PV-2SG.ERG AV-find ABS child LNK that
 ‘How do you find that child?’ (Lin 2012:186)

The interrogative words that can be syntactically realised as verbs in the two languages denote ‘what’, ‘how’, ‘where’, and ‘how many/much’, whereas the interrogative words that denote ‘who’, ‘whose’, ‘which’, ‘when’, and ‘why’ cannot serve as verbal predicates as they cannot take voice markers. The affixation of voice markers is unique to verbal predicates, but not non-verbal predicates.

Transitivity of interrogative verbs in Amis and Kavalan is correlated with the voice markers that are affixed to them. Intransitive interrogative verbs are affixed with the agent voice marker, e.g., (1a) and (2a), whereas transitive interrogative verbs are affixed with the patient voice marker, e.g., (1b) and (2b).

It is also found that there are semantic constraints on the use of interrogative words as verbs. For example, the use of *tanian* ‘where’ as a verb in Kavalan is restricted to questions about the location of the theme argument in a ditransitive event. Questions about the location where an event takes place cannot utilise *tanian* as a verb. Consider the following examples.

(3) Kavalan

- a. *tanian-an-su ya kelisiw-su?*
 where-PV-2SG.ERG ABS money-2SG.GEN
 ‘Where do you put your money?’ (Not ‘Where is your money?’)
 (Lin 2012:200)

¹ Glossing conventions in this paper follow the Leipzig Glossing Rules. Additional glossing conventions are as follows: AV, agent voice; CN, common noun; CP, completive aspect; ENC, enclitic; FAC, factual; HUM, human; IA, instrumental applicative; LA, locative applicative; LNK, linker; NCM, non-common noun marker; NHUM, non-human; PN, proper noun; PREP, preposition; PV, patient voice.

- b. * *tanian-an-su* *q<m>an* *tu/ya* *babuy?*
 where-PV-2SG.ERG <AV>eat OBL/ABS pig
 (Intended for: ‘Where do you eat pork?’) (Lin 2012:201)

The intended meaning of the question in (3a) is to inquire about the location of the theme argument, whereas (3b) is intended to ask where the event of eating pork takes place. Only in the former case can *tanian* be used as a verb and be affixed with the patient voice marker. In questions concerning where an event takes place, *tanian* is used as an adverbial expression without taking any voice markers and occurs in the same position as a locative adverbial, as demonstrated below.

- (4) Kavalan
- a. *tanian* *q<m>an=isu* *tu* *babuy?*
 where <AV>eat=2SG.ABS OBL pig
 ‘Where do you eat pork?’
- b. *tanian* *tanuz-an* *na* *tuliq* *ya* *wasu?*
 where chase-PV ERG bee ABS dog
 ‘Where do the bees chase the dog?’ (Lin 2012:201)
- c. *tanuz-an* *na* *tuliq* *ya* *wasu* *tanian?*
 chase-PV ERG bee ABS dog where
 ‘Where do the bees chase the dog?’ (Lin 2012:201)

The same restriction can be observed for *icuwa* ‘where’ in Amis.

- (5) Amis
- a. *icuwa-en* *isu* *k-u* *payci?*
 where-PV 2SG.ERG ABS-CN money
 ‘Where do you put the money?’
- b. * *icuwa-en* *isu* *mi-saosi* *k-u* *cudad?*
 where-PV 2SG.ERG AV-read ABS-CN book
 (Intended for: ‘Where do you read the book?’)

1.2 Goals and organisation

The characteristics and constraints of the interrogative verbs in Amis and Kavalan require a theoretical explanation. In the present paper, I propose a syntactic account for the derivation of the interrogative verbs in the two languages along the lines of Marantz (1997). I will argue that the derivation of interrogative verbs is systematic because whether an interrogative word can be used as a verb can be attributed to universal or language-specific principles or constraints of syntax, the syntactic representations of voice markers, and their corresponding interpretations. This syntactic analysis not only provides a natural explanation for the correlation between voice markers and the transitivity/interpretation of interrogative verbs but also accounts for the semantic restrictions on the use of interrogative verbs in a straightforward and uniform way.

I will also present more empirical evidence for this syntactic analysis by showing that it can explain why certain interrogative verbs must receive a specific interpretation and why some interrogative words cannot be used as verbs. The findings suggest that the

derivations of interrogative verbs are not idiosyncratic, but exhibit a regular pattern and obey syntactic principles and constraints.

I will first clarify the assumptions of the proposed syntactic approach in section 1.3. The main argumentation of this paper is presented in sections 2 and 4. Section 2 discusses the syntactic derivations of interrogative verbs and argues that the derivations obey syntactic principles and constraints. The applicability of the proposed syntactic analysis to other “non-canonical” verbs in Kavalan and Amis is explored in section 3. Based on the analysis formulated in section 2, section 4 explains why certain interrogative words cannot be used as verbs in Kavalan and Amis. Section 5 concludes the study.

1.3 Syntactic assumptions

Adopting the framework of Distributed Morphology (Halle & Marantz 1993, 1994), the present study assumes that roots are not specified for syntactic categories like N and V. What determines the syntactic category of roots are functional heads like v^0 , n^0 , and a^0 . When a root occurs in a verbal environment with the v^0 functional head, it appears as a verb; if instead the root occurs in a nominal environment, it becomes a noun.

Following Starosta (2002[2009]), I analyse voice markers as derivational morphemes. I further suggest that verbal derivations involving voice markers should take place in Syntax. In other words, I reject the assumption that derivational morphology must be implemented in the Lexicon and adopt a syntactic approach to derivational morphology (Harley 2009).

I also assume that the so-called voice markers in Amis and Kavalan are phonological realisations of the category-defining head v^0 due to the following two reasons. First, the affixation of the voice markers is specific to verbal predicates, but not non-verbal predicates. Even though the voice markers also occur in de-verbal nominals, the nominalised words or clauses still possess verbal properties and contain verbal projections (Lin 2010). Nominals with AV/PV exhibit clausal structure higher than VP, unlike English nominalisers *-er/-ee*. They should be analysed as headless relative clauses.

Second, the voice markers can derive denominal verbs. In (6a), *nanum* ‘water’ is an object-denoting noun and appears in a canonical NP position, but when it is affixed with a voice marker as in (6b), it occurs in the predicate position and denotes an activity or action associated with the object denoted by its nominal counterpart.

(6) Amis

- a. *mi-sni' t-u nanum i takid.*
 AV-pour OBL-CN water PREP cup
 ‘(Somebody) pours water into the cup.’
- b. *mi-nanum=ho kaku.*
 AV-drink=IPFV 1SG.ABS
 ‘I am still drinking water.’

In fact, it has been argued that all the lexical roots in Amis are inherently nominal and verbs must be derived via the affixation of voice markers (Wu 2006).

Assuming that the distinction between agent voice and patient voice is correlated with their transitivity (Liao 2002, 2004; Ross & Teng 2005), the present study construes the agent voice marker as an intransitive marker and the patient voice marker a transitive marker. Note that although verbs in the agent voice construction can take a patient argument, this structure is still considered to be syntactically intransitive because the patient argument is demoted and receives oblique case (S. Huang & Tanangkingsing 2011; Liao 2002, 2004). By contrast, the patient voice construction should be analysed as the canonical transitive construction.

2 Syntactic derivations of interrogative verbs

2.1 Syntactic derivations of interrogative verbs based on ‘what’ and ‘how’

Given the assumption that voice markers are verb-defining heads in Syntax, the correlation between the transitivity of interrogative verbs and the voice markers that they take can be attributed to the syntactic nature of *v* that the interrogative roots are merged with. The agent voice marker realises intransitive *v*, whereas the patient voice marker is inserted when *v* is transitive.² That is, the transitivity of an interrogative verb is determined by *v* directly. An interrogative root always has at most one argument, and the transitivity of an interrogative verb is derived via the merger of its root with *v* in Syntax.

Consider the following two sets of sentences.

(7) Kavalan

- a. *q<um>uni=isu* *tangi?*
 <AV>do.what=2SG.ABS just now
 ‘What were you doing just now?’ (Repeated from (2a))
- b. *quni-an-su* *ya* *sunis-ku?*
 do.what-PV-2SG.ERG ABS child-1SG.GEN
 ‘What did you do to my child?’

(8) Amis

- a. *mi-maan* *ci* *panay?*
 AV-do.what NCM PN
 ‘What is Panay doing?’ (Repeated from (1a))
- b. *ma-maan* *cingra?*
 AV-what.happen 3SG.ABS
 ‘What happened to him?’
- c. *na* *maan-en* *isu* *k-u-ra* *wacu?*
 PST do.what-PV 2SG.ERG ABS-CN-that dog
 ‘What did you do to that dog?’

² I adopt the mechanism of late insertion in Distributed Morphology. A voice marker is analysed as the phonological realisation of a specific type of *v* node, which is defined by morphosyntactic features. Syntax has access to morphosyntactic features or feature bundles, not phonological forms, which are inserted to appropriate nodes after the entire syntactic structure is constructed and sent to the phonological component.

These sentences reveal that the transitivity of an interrogative root like *quni* or *maan* is not lexically specified, but is determined by the voice marker that it takes. When affixed with an agent voice marker, it is morphosyntactically used as an intransitive verb, i.e., ‘do what’ or ‘what happen to’ (7a, 8a, 8b); if it takes a patient voice marker instead, it is morphosyntactically used as a transitive verb, i.e., ‘do what to’ (7b, 8c).³ In terms of syntactic structure, the interrogative roots in (7a), (8a), and (8b) are merged with an intransitive *v*, which is realised phonologically by an agent voice marker. As for (7b) and (8c), what is merged with the interrogative roots and determines their syntactic category and transitivity is a transitive *v*, which is later realised phonologically by a patient voice marker. I will elaborate on the syntactic structures of these voice markers later in this section after discussing more semantic distinctions among them.

Verbalizing heads exhibit finer semantic distinctions in addition to transitivity. It has been suggested that there are several distinct verb-defining heads with different (combinations of) syntactic/semantic features. One type of *v* that has been extensively discussed is the agent-introducing head, *v*[AG] (Marantz 1997) or Voice (Kratzer 1996). The verbal structure of unaccusative verbs is headed by another type of *v*, which is more like a BECOME-operator (Marantz 1997). Harley (2009) characterises different types of *v* in terms of feature clusters like [$\pm$ dynamic], [$\pm$ change of state], and [$\pm$ cause] as in (9).

- (9) The feature specifications of *v* (Harley 2009):
- a. *v*_{CAUSE} : [+dynamic], [+change of state], [+cause]
 - b. *v*_{BECOME} : [+dynamic], [+change of state], [-cause]
 - c. *v*_{DO} : [+dynamic], [-change of state], [-cause]
 - d. *v*_{BE} : [-dynamic], [-change of state], [-cause]

The merger of a root with different types of *v* will thus derive verbs with different Aktionsart properties. The syntactic analysis just presented can account for the interpretation of interrogative verbs if different forms of a particular voice marker are conceived of as phonological realisations of different types of *v* as well.

One clear case in point concerns the contrast between (8a) and (8b). When Amis *maan* is affixed with *mi-*, it is interpreted as an interrogative activity verb; the affixation of *ma-* to this interrogative root derives an interrogative change-of-state verb. This contrast results from the fact that *mi-* and *ma-* realise two distinct *v* heads: *v*_{DO} and *v*_{BECOME} respectively. According to Wu’s (2006) investigation of the semantics of voice markers in Amis, the affixation of *mi-* to a root, which can inherently denote either an object or an activity, can derive a plain activity verb with an optional motional/purposive/progressive reading. This is illustrated by the following two sentences.⁴

³ Although the English translation in (7a) and (8a) suggests that ‘what’ is a direct object of the verb ‘do’ and that the structure is transitive, the analysis of the English translation cannot apply to the corresponding Kavalan and Amis sentences. The interrogative words in (7a) and (8a) are realised as verbs without taking any direct object syntactically. The structure of the two sentences is intransitive regardless of the structure of their English translation.

⁴ All the examples cited from Wu (2006) in this paper have been re-glossed.

(10) Amis

a. *mi-nanum ci aki t-u nanum.*

AV-water NCM PN OBL-CN water

‘Aki is going to drink water./Aki is drinking water.’ (Wu 2006:165)

b. *mi-palu ci sawmah ci mayaw-an.*

AV-beat NCM PN NCM PN-OBL

‘Sawmah is going to beat Mayaw./Sawmah is beating Mayaw.’ (Wu 2006:166)

As for *ma-*, its combination with a root can derive a verb that is interpreted as a result state.⁵ The following two sentences demonstrate this meaning of *ma-*.

(11) Amis (Wu 2006:183)

a. *ma-adah=tu kaku.*

AV-recover=PFV 1SG.ABS

‘I have recovered (from illness).’

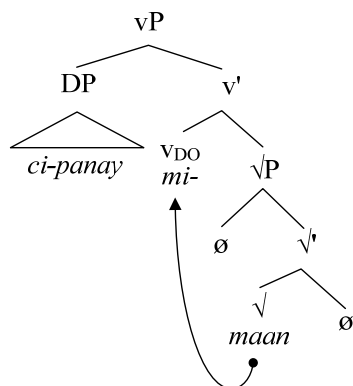
b. *ma-ruhem=tu k-u pawli.*

AV-ripe=PFV ABS-CN banana

‘The banana is ripe (just now).’

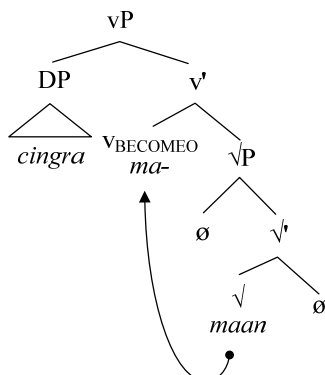
In the theoretical framework of the present paper, *mi-* can be conceived of as an activity-denoting *v*, i.e., *v*_{DO} and *ma-* can be analysed as *v*_{BECOME}, which indicates change of state. The different interpretations of (8a) and (8b), i.e., *mi-maan* and *ma-maan*, lie in the feature clusters of *v* that *maan* is merged with. The trees in (12) and (13) represent the derivations of (8a) and (8b), respectively.

(12) (Partial) derivation for (8a)



⁵ Wu (2006) classifies *ma-* verbs into four types, each of which is associated with a distinct logical structure. Only the second type, or *ma*₋₂, is relevant to our discussion here.

(13) (Partial) derivation for (8b)



In (12), *maan* undergoes head movement to v_{DO} , which is the shorthand notation for the feature cluster [+dynamic, -change of state, -cause] and which is phonologically realised as the agent voice marker *mi-*. The resultant *mi-maan* thus denotes a plain activity with an interrogative sense and the DP in the specifier of vP is interpreted as the agent of the activity. By contrast, the verbalizing head in (13) consists of the features, [+dynamic], [+change of state], and [-cause] and *ma-* is inserted in this morphosyntactic context. The resultant *ma-maan* is interpreted as a result state and the DP in Spec, vP thus refers to a theme argument that undergoes the relevant change of state. The meaning ‘what became of him’ or ‘what happened to him’ is thus derived.

Unlike *mi-maan* and *ma-maan*, *maan-en* is interpreted as a transitive interrogative verb ‘do what to’. This interpretation is also due to the specific feature cluster of the *v* headed by the patient voice marker *-en*. According to Wu (2006), a verb that is derived via the suffixation of *-en* must have an animate causer/agent and the use of this derived verb emphasises the intention of the agent. This can be demonstrated by the contrast between the following two sentences. The ergative DP in (14a) is an animate causer/agent, but the ergative DP in (14b) is not.

(14) Amis

- a. *tuniq-en* *aku* *ku* *ti'ti'* *aca*.
 soft-PV 1SG.ERG ABS meat a.little
 ‘I will tenderise the meat a little.’⁶ (Wu 2006:174)
- b. * *tuniq-en* *nu* *kuwaq* *ku* *ti'ti'* *aca*.
 soft-PV ERG papaya ABS meat a.little

In other words, the verbalizing head that *-en* realises must be [+agentive].

Moreover, the utilisation of a verb suffixed with *-en* always implicates the completion of the action. When *-en* verbs take the imperfective aspect marker *=ho*, they can never receive a progressive interpretation. Compare the following two sentences.

(15) Amis (Wu 2006:176)

- a. *ranam-en=ho*.
 breakfast-PV=IPFV
 ‘Eat the same thing for the breakfast again!’

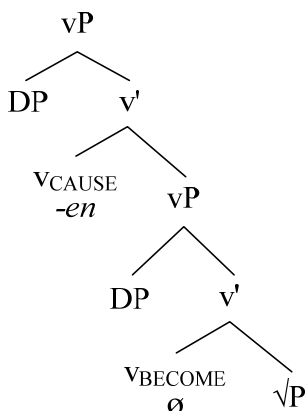
⁶ The correct translation should be “I will tenderise only the meat.” (Joy Wu, pers. comm.).

- b. *mi-nanum=ho ci panay t-u sayta.*
 AV-water=IPFV NCM PN OBL-CN soda
 ‘Panay is still drinking soda.’

The verbs in (15a) and (15b) both take the imperfective aspect marker *=ho*. While the verb in (15a), which is suffixed with *-en*, receives an iterative reading, the verb in (15b), which takes the agent voice marker *mi-*, is interpreted as progressive. This suggests that *-en* is inherently [+telic].

In the framework adopted by the present study, the verbalizing head that is realised as *-en* in Amis can be analysed as v_{CAUSE} , which can introduce an agentive causer and implies an endpoint, change of state, or the completion of an action.⁷ To capture the inherent semantics of *-en* and its implications, I propose the following verbal structure for verbs that are derived with this suffix.⁸

(16) The verbal structure of *-en*



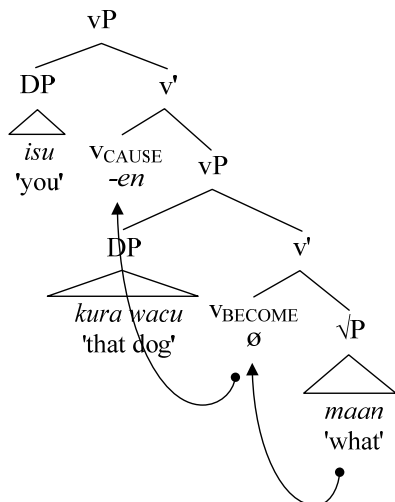
This structure for *-en* is basically the same as the lexical relational structure assigned to English causative deadjectival verbs by Hale & Keyser (1993). I adopt their conception that the vP/VP -shell structure is associated with an asymmetric semantic relation of implication, where a dynamic event encoded in the higher vP/VP “implicates” an interrelation or a state encoded in the lower vP/VP . The structure in (16) thus aptly reflects the status of *-en* as a causative operator that necessarily implicates an endpoint of the action or change of state. The higher v_{CAUSE} introduces an agent, whereas the lower v_{BECOME} [+change of state] ensures that the root merged with it receives a telic interpretation. When this suffix is merged with *maan*, the interpretation of the resultant verb, *maan-en*, follows from the structure in (16).

⁷ As both Amis and Kavalan have a causative prefix *pa-*, the analysis of the patient voice marker as v_{CAUSE} raises a question concerning the differences between the causative prefix and the patient voice marker. The causative prefix is more productive than the patient voice marker in marking a causative event. The two morphemes can co-occur and introduce an agent or causer respectively. How to differentiate the two markers in the syntactic framework we adopt, however, is beyond the scope of the present paper.

⁸ An anonymous reviewer points out that v_{CAUSE} does not necessarily introduce an agent, as a non-agentive entity can also be a causer. This suggests that Harley’s (2009) classification of v needs to make a distinction between two variants of v_{CAUSE} : [+agentive] and [-agentive]. The patient voice marker is inserted under v_{CAUSE} with the feature [+agentive].

Consider the (partial) derivation in (17) for (8c). The higher *v* headed by *-en* introduces an agentive causer, *isu* '2SG.ERG', and implies the existence of an endpoint of the action as indicated by the lower *vP* whose head introduces a theme argument, *kura wacu* 'that dog', which is affected by the action. The derived verb, *maan-en*, is thus construed as a transitive interrogative verb with both an agent argument and a theme argument. The interpretation can be paraphrased as 'X does what such that X causes Y to be in a certain state?' or 'X does something to Y and what happens to Y as a result of this?'.

(17) (Partial) derivation for (8c)



A question arises as to why the lower *v* in the *vP*-shell structure of (16) or (17) is never realised. It should be noted that there are no verbs that can simultaneously take an agent voice marker *mi-* or *ma-* and a patient voice marker like *-en*. The following verbs are ill-formed.

(18) Amis

- a. * *mi-nanum-en*
- b. * *ma-ruhem-en*

However, voice markers can co-occur with an instrumental or a locative applicative markers. The following examples are for illustration.⁹

(19) Amis

- | | | | | | |
|----|--------------------------|-----------|-------------|------------|--------------|
| a. | <i>ka-kum>a'en-an</i> | <i>ni</i> | <i>ofad</i> | <i>t-u</i> | <i>'epah</i> |
| | KA-<UM>eat-LA | ERG | PN | OBL-CN | wine |
| | k-u luma | aku. | | | |
| | ABS-CN house | 1SG.GEN | | | |
- 'Ofad drinks (wine) at my place. (My place is where Ofad drinks (wine).)'

⁹ According to Wu (2006), an AV marker that co-occurs with an applicative affix indicates the conjugation of the verb in the applicative construction, with the conjugated forms determining the semantic role of the applied argument, e.g., location (19a) or purpose (19b). As an AV marker in the applicative construction does not perform the typical function of an AV marker, it is not glossed as AV in this paper, as shown in (19).

- b. *mi-cikay-an ni ofad i pitilidan k-u cudad.*
 MI-run-LA ERG PN PREP school ABS-CN book
 ‘Ofad runs to school to get the book (for the book). (The book is what Ofad runs to school to get).’
- c. *sa-ka-k<um>a’en ni ofad t-u futing k-u alapit.*
 IA-KA-<UM>eat ERG PN OBL-CN fish ABS-CN chopsticks
 ‘Ofad eats fish with the chopsticks. (The chopsticks are what Ofad uses to eat fish.)’

The co-occurrence of voice markers with an applicative marker is one of the reasons why Wu (2006) analyses the so-called locative and circumstantial voice markers in Amis as applicative markers. They perform different functions and should not be classified into the same paradigm. This means that they are governed by different insertion rules and thus are considered separately when insertion takes place. By contrast, the co-occurrence restriction of an agent voice marker and a patient voice marker indicates that they belong to the same set of insertion rules.

I propose that fusion takes place in the vP-shell structure of (16) or (17). Fusion is a grammatical process that fuses two terminal nodes that are sisters, e.g., two heads after head-to-head movement, into one single node (Halle & Marantz 1993). As fusion results in one single terminal node, only one vocabulary item can be inserted into this position. In (17), v_{BECOME} and v_{CAUSE} undergo fusion and become one single terminal node, which is a composite of both CAUSE-operator and BECOME-operator. This leads to the semantic implication of the vP-shell structure, i.e., ‘X does something and causes Y to become Z’. Due to the semantic components of the patient voice marker *-en*, i.e., [+dynamic], [+change of state], [+cause], it is inserted into this position, but not other voice markers. It should be noted that fusion of terminal nodes is subject to cross-linguistic differences (Halle & Marantz 1993). While fusion of v_{BECOME} and v_{CAUSE} takes place in Amis, the two terminal nodes can be realised by independent morphemes in other languages, e.g., Japanese.¹⁰

Note that Amis *maan* can also be used as a noun as in (20), where it occurs in a case-marked position.

- (20) Amis
ma-talaw ci lekal t-u maan?
 AV-afraid NCM PN OBL-CN what
 ‘What is Lekal afraid of?’

As verbal *maan* is derived in a syntactic context where it can be merged with a verbalizing head via head movement, the use of *maan* as a noun is also contingent on its syntactic environment. In (20), it is moved to *n*, the category-defining head for nouns, so that it can further be case-marked. An equally plausible alternative is to attribute the nominal status of *maan* in (20) to the presence of D, or the case marker *ku*. On this alternative analysis, there is no need to posit the noun-deriving head *n* in Amis. Amis *maan* is an exemplar that shows how the lexical category and interpretation of an

¹⁰ I would like to thank an anonymous reviewer for pointing this out for me.

interrogative root can vary with and be determined by the syntactic context where it occurs.

This syntactic analysis of Amis *maan* can apply to its Kavalan counterpart, *quni* ‘do what’, the transitivity and interpretation of which is also conditioned by the voice marker that it takes. One prominent difference between Kavalan and Amis concerns the semantics of the different forms of the agent voice. While each form of the Amis agent voice morpheme is associated with a distinct logical structure or interpretation, as shown above for *mi-* and *ma-*, the choice of Kavalan agent voice forms seems to be conditioned by phonology, i.e., phonologically-conditioned allomorphy, and is subject to lexical variation to a great extent. In other words, Kavalan differs from Amis in that it does not utilise distinct lexical items to realise different types of intransitive *v*. However, the overt distinction between the intransitive *v* and the transitive *v* is still preserved in Kavalan. The agent voice construction is an intransitive syntactic structure, whereas the patient voice construction is the canonical transitive structure. For example, *q<um>uni* ‘do what’, an intransitive interrogative verb with an agent argument, is derived by moving the root *quni* to *v_{DO}*, which can assign an agent theta-role.

The function of the patient voice marker *-an* in Kavalan is similar to Amis *-en* in that *-an* also introduces an agent or causer argument and implies an endpoint, a change of state, or the completion of an action. As illustrated below, *-an* is analogous to the causative marker *pa-* in terms of their function to introduce an external argument (21c), 21d). Note that when *sabiqbiq* ‘boil’ is used in its agent voice form as in (21a), it can only have an unaccusative interpretation, as demonstrated by the ungrammaticality of (21b), where there is an additional external argument.

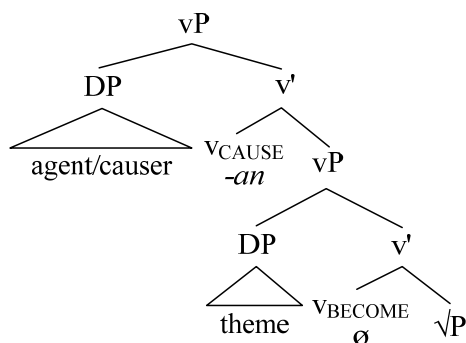
(21) Kavalan

- a. *sabiqbiq=ti ya z anum ’nay.*
boil=PFV ABS water that
‘The water has boiled.’
- b. * *sabiqbiq=ti=iku tu z anum.*
boil=PFV=1SG.ABSOBL water
- c. *pa-sabiqbiq=ti=iku tu z anum.*
CAUS-boil=PFV=1SG.ABSOBL water
‘I boiled water. (I had the water boiled.)’
- d. *sabiqbiq-an-ku ya z anum ’nay.*
boil-PV-1SG.ERG ABS water that
‘I boiled the water.’

Compare (21a) with (21d). The patient voice marker in (21d) functions as a causative operator that introduces an extra agentive causer, and the action performed by this agentive causer leads to the change of state of the theme argument assigned by the original agent voice predicate. The patient voice marker *-an* should thus be construed as the phonological realisation of *v_{CAUSE}*. Like Amis *-en*, it also involves a *vP*-shell structure with an implicational causal relation between the higher *vP* and the lower *vP* in accordance with Hale & Keyser’s (1993) analysis of de-adjectival verbs in English. Its structure is schematically represented in (22). The merger of *quni* with *-an* leads to the

derivation of a transitive interrogative verb that requires an agentive causer and a theme argument that undergoes the action.

(22) The structure of Kavalan *-an*



It has been found that *-an* can also introduce an additional theme argument (Chang 1997). According to Chang (1997), an intransitive verb is allowed to take an additional argument when it is affixed with the patient voice marker *-an*, but not when it takes the agent voice marker. The contrast between (23a) and (23b) illustrates this function of *-an*.¹¹ The patient voice marker in (23e) also performs the same function. The addition of an oblique argument that is affected by the event to an agent voice sentence in (23d) is only slightly acceptable. Its patient voice counterpart, (23e), is fully grammatical. The absolutive DP in (23e), 'his mother', is interpreted as an argument that is affected by the action of the agent.

(23) Kavalan

- a. ? *maynep=iku tu qaynepan.*
 sleep.AV=1SG.ABS OBL bed
 (Intended for: 'I am sleeping in a bed.')
- b. *qaynep-an-ku ya qaynepan.*
 sleep-PV-1SG.ERG ABS bed
 'I slept in the bed.'
- c. *t<m>alumbi ta-liab-an na takan ya sunis*
 <AV>hide LOC-underside-LOC GEN table ABS child
a yau.
 LNK that
 'The child hides under the table.'
- d. ? *t<m>alumbi ta-liab-an na takan ya sunis a yau*
 <AV>hide LOC-underside-LOC GEN table ABS child LNK that
tu tina-na.
 OBL mother-3GEN
 (Intended for: 'The child hides under the table from his mother.')

¹¹ The examples in (23a) and (23b) from Chang (1997) have been re-glossed.

- e. *talumbi-an na sunis a yau ta-liab-an na*
 hide-PV ERG child LNK that LOC-underside-LOC GEN
takan ya tina-na.
 table ABS mother-3GEN
 ‘The child hides under the table from his mother.’

Thus, the argument structure of *-an* includes not only an agent argument, but also a theme argument that is affected by the action of the agent.¹² This provides further justification for the syntactic structure of *-an* in (22).

It is noteworthy that ‘what’ and ‘how’ share the same root in both Kavalan and Amis. Moreover, both interrogative words can take the patient voice marker, as illustrated below.

(24) Kavalan

- a. *(na)quni-an-su ya sunis a yau?*
 do.what-PV-2SG.ERG ABS child LNK that
 ‘What do you do to that child?’
- b. *(na)quni-an-su m-kala ya sunis a yau?*
 do.how-PV-2SG.ERG AV-find ABS child LNK that
 ‘How do you find that child?’

(25) Amis

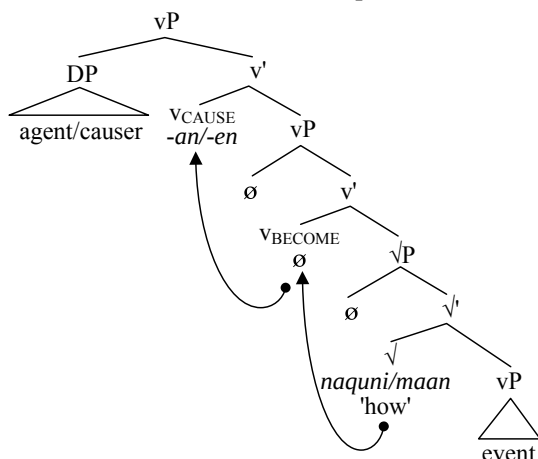
- a. *na maan-en isu k-u-rawacu?*
 PST do.what-PV 2SG.ERG ABS-CN-that dog
 ‘What did you do to that dog?’
- b. *na maan-en ni panay mi-padang kisu?*
 PST do.how-PV ERG PN AV-help 2SG.ABS
 ‘How did Panay help you?’

The only difference on the surface lies in the additional verb in the ‘how’-question. Nevertheless, ‘do what’ and ‘do how’ are conceptually related as a ‘how’-question can be easily paraphrased as a ‘do.what’-question. For example, ‘How did you find the child?’ can be paraphrased as ‘What did you do to find the child?’. It is thus highly probable that (24a) and (24b) or (25a) and (25b) involve the same verbal derivation with the same category-defining head, v_{CAUSE} .

¹² An anonymous reviewer raises a question regarding where the additional affected argument of *-an*, e.g., *tina-na* ‘his mother’ in (23e), is located in the vP-shell structure. The affected argument in (23e) is not really the theme, as the sentence does not mean ‘the child caused his mother to hide’. It is likely that the *v* below v_{CAUSE} might actually be an applicative head that licenses an extra argument like an affectee according to Pylkkänen’s (2008) analysis of non-core arguments. Another possibility is that the structure of the patient voice marker contains not only v_{CAUSE} and v_{BECOME} but also an applicative head. The questions of whether the patient voice marker is associated with any applicative function and how it interacts with the overt applicative markers cannot be answered without a separate detailed study on the syntax and semantics of applicative constructions in Kavalan and Amis. The evidence presented here, nevertheless, is sufficient to show that the structure of the patient voice marker is more complicated than a single-layered $v\text{P}_{\text{CAUSE}}$.

First, both types of questions require an agent or causer that brings about a certain action or event. Second, they both imply an endpoint. In the case of transitive ‘do what’, this endpoint interpretation is due to the change of state of the theme argument that is affected by the action. As for ‘do how’, the endpoint interpretation emanates from the completion of an action. The derivation for ‘do how’, as represented below in (26), is thus analogous to transitive ‘do what’, except that there is a vP complement to the interrogative root. As with transitive ‘do what’, ‘do how’ is also derived via head movement of the interrogative root to v_{CAUSE} , which is realised as the patient voice marker *-en* or *-an*, thus their homogeneity. However, ‘do how’ requires a vP complement and per the implicational causal relation of the vP-shell structure, v_{BECOME} indicates that the action/event brought about by the agent/causer induces the completion of another event. In this sense, v_{BECOME} in (26) is slightly different from its counterpart in (17), the structure for transitive ‘do what’, although both signal the existence of an endpoint.

(26) The structure of the ‘do how’-question



2.2 Syntactic derivations of interrogative verbs based on ‘where’

The syntactic approach delineated above for the derivation of ‘do what’ and ‘do how’ can also provide a natural explanation for the grammatical properties and syntactic distributions of *tanian* and *icuwa* ‘where’. The use of Kavalan *tanian* and Amis *icuwa* as verbs is restricted to questions about the location of the theme argument in a ditransitive event. Questions about the location where an event takes place cannot utilise *tanian* or *icuwa* as a verb. Consider the following examples.

(27) Kavalan

- a. *tanian-an-su* *ya kelisiw-su?*
 where-PV-2SG.ERG ABS money-2SG.GEN
 ‘Where do you put your money?’
- b. * *tanian-an-su* *q<m>an tu/ya babuy?*
 where-PV-2SG.ERG <AV>eat OBL/ABS pig
 (Intended for: ‘Where do you eat pork?’)

(28) Amis

- a. *icuwa-en* *isu* *k-u* *payci?*
 where-PV 2SG.ERG ABS-CN money
 ‘Where do you put the money?’
- b. * *icuwa-en* *isu* *mi-saosi* *k-u* *cuɬad?*
 where-PV 2SG.ERG AV-read ABS-CN book
 (Intended for: ‘Where do you read the book?’)

It is argued below that their grammatical properties and restrictions can be derived with reference to the syntactic environment of the interrogatives themselves. Specifically, like other interrogative verbs that have been discussed, *tanian* and *icuwa* serve as verbs when they are selected by a category-defining verbal head, the little *v*.

The adverbial, in situ properties of the adjunct use of *tanian* and *icuwa* as in (29) and (30) follow from their adjunct status. Not being selected by little *v*, *tanian* and *icuwa* cannot be a verb in these constructions and therefore lack verbal properties. Rather, adjunct *tanian* and *icuwa* take scope over the entire verb phrase.

(29) Kavalan

- a. *tanuz-an* *na* *tuliq* *tanian* *ya* *wasu?*
 chase-PV ERG bee where ABS dog
 ‘Where do the bees chase the dog?’
- b. *tanian* *tanuz-an* *na* *tuliq* *ya* *wasu?*
 where chase-PV ERG bee ABS dog
 ‘Where do the bees chase the dog?’

(30) Amis

- a. *kum>a'en* *kisu* *t-u* *hemay* *icuwa?*
 <AV>eat 2SG.ABS OBL-CN rice where
 ‘Where do you eat?’
- b. *icuwa* *kum>a'en* *kisu* *t-u* *hemay?*
 where <AV>eat 2SG.ABS OBL-CN rice
 ‘Where do you eat?’

In (29), the question is intended to inquire about the location where the bees chase the dog. Likewise, in (30), the question concerns the location where the addressee eats. Since the scope of *tanian* and *icuwa* in (29) and (30) ranges over an event, it is not unreasonable to assume that they are adjoined to *vP* or *TP*. The different adjunction positions lead to the word order differences between (29a) and (29b) or between (30a) and (30b).

Whether *tanian* or *icuwa* is adjoined to *vP* or *TP*, there is no way for it to take the voice marker in *v*, which has been merged with the lexical verb. Even if *tanian* is adjoined to the projection of the root phrase before the root moves to *v*, it is still forbidden from moving to *v* because it is inside an adjoined phrase. Head movement out of a specifier or an adjunct is never attested. In the GB framework, this is due to the Head Movement Constraint (Travis 1984) or the Empty Category Principle (Chomsky 1981).

(31) Head Movement Constraint (HMC)

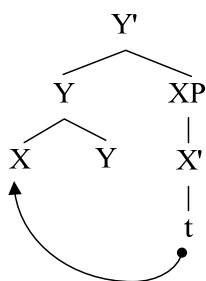
X^0 may only move into Y^0 that properly governs it.

(32) Empty Category Principle (ECP)

An empty category must be properly governed.

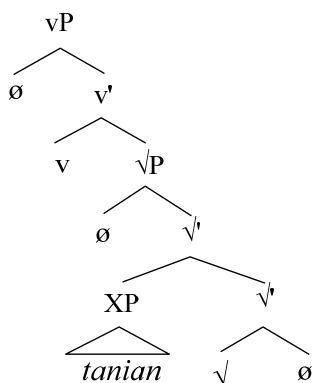
Baker (1988) assumes that the HMC can be derived from the ECP and head movement of X to Y, as represented in (33) below, results in a head-adjunction structure, where the adjunction node does not count as the first branching node for c-command. Under the framework of GB, Baker (1988) proposes that if XP in (33) below is selected by Y, it does not count as a barrier for government from Y. This way, the trace of X in (33) can be antecedent-governed.

(33)



Suppose *tanian* is adjoined to the root phrase instead of vP or TP, as represented below.¹³

(34)



As an adjunct, its movement to *v* would violate the ECP because the phrase that it projects is not selected by vP and will act as a barrier for government. The illicit movement will lead to a structure where *tanian* cannot antecedent-govern its trace.

The notion of government has been abandoned by the Minimalist Program. However, the empirical fact that a head in a specifier or an adjoined phrase cannot move out of this position still holds. Other theoretical principles or conditions compatible with Minimalist ideas must be sought to explain this syntactic phenomenon. According to Matushansky (2006), the Transparency Condition as formulated in (35) is a potential principle that can generate the same effects as the Head Movement Constraint.

¹³ I assume with Ernst (2002) that adjuncts can be attached to an intermediate projection instead of a maximal projection.

(35) Transparency Condition (Matushansky 2006:78)

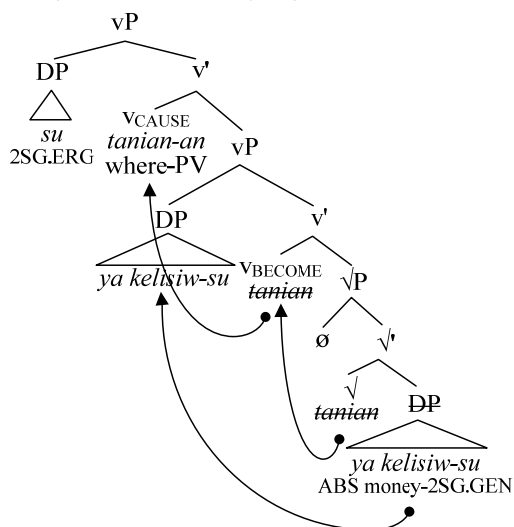
A head ceases to be accessible once another head starts to project.

The Transparency Condition functions to ensure that only heads that are still projecting at some point of syntactic derivations are accessible to syntactic operations. When a head X^0 enters the derivation and merges with its complement phrase YP, it is necessary to assess both X^0 and Y^0 in order to determine which head projects. At this point, both heads are likely to project and thus both are still accessible to syntactic operations like movement or Re-merge. Once the selection of X^0 for Y^0 is established, Y^0 is able to move to X^0 at this point of the derivation. This translates into the well-known generalisation of the locality of head movement: A head Z^0 can move to the head W^0 of the phrase WP that takes ZP as the complement, but cannot skip it. The Transparency Condition rules out the configuration where the head in a specifier or an adjoined phrase moves to a c-commanding head that does not select for it. Take (34) as an example. When v merges with $\sqrt{P}$, XP, which has been adjoined to $\sqrt{P}$, is no longer projecting. Therefore, X^0 is not accessible to syntactic operations and is not allowed to move to v . The ban on head movement out of an adjoined phrase can be explained by the Transparency Condition without invoking the notion of government.

Regardless of what theoretical mechanism is adopted, if *tanian* in (34) moves to v , this will result in an illicit syntactic configuration. Therefore, when *tanian* is used to question the location where an event takes place, it cannot take a voice marker and be used as a verb. The observation that adjunct *tanian* cannot be used as a verb finds a natural explanation in the proposed syntactic analysis. The analysis assumes that interrogative verbs are derived in Syntax and thus their derivations must conform to established syntactic principles and constraints like the HMC, the ECP, or the Transparency Condition.

By contrast, the verbal derivation for *tanian* or *icuwa* in a question that inquires about the location of a theme argument as in (27a) and (28a) does not incur any violation of syntactic principles and constraints. Take (27a) as an example. The derivation begins with the merger of $\sqrt{\text{TANIAN}}$ ‘where’ with *kelisiw-su* ‘money-2SG.GEN’. This is because the DP *kelisiw-su* is the theme argument of $\sqrt{\text{TANIAN}}$ ‘where’. The interrogative root then moves to v_{BECOME} and v_{CAUSE} in a successive-cyclic fashion. The derivation can be schematically represented in (36). The movement of $\sqrt{\text{TANIAN}}$ to v_{BECOME} and v_{CAUSE} obeys the ECP or the Transparency Condition. The higher v is the causative operator CAUSE which entails an agent thematic role and defines transitive verbs. This head is spelled out as the patient voice marker *-an* in Kavalan. Together with the inherent locational and interrogative semantics of *tanian*, the result is a transitive construction in which the location of the theme is in question. The movement of the theme DP *ya kelisiw-su* in (36) is motivated by Case checking. Only finite T can check absolutive Case in Kavalan. Before the theme DP can move to Spec, T, it must first move to the edge of vP , which is a phase, or otherwise it would be stranded due to the Phase Impenetrability Condition.

(36) (Partial) derivation for (27a)¹⁴



Specifically, the vP-shell structure with v_{CAUSE} and v_{BECOME} involves an implicational relation where the action performed by the agent introduced by v_{CAUSE} must imply an endpoint. In the case of (36), the endpoint interpretation arises from the change of state of the theme argument, i.e., its ending up being somewhere. The meaning of (36) can thus be paraphrased as ‘X (the agent) does something and this causes Y (the theme) to be where?’ Without a secondary lexical verb, the details of the action are left under-specified, leading to a meaning of something like ‘X put Y where?’ When a secondary lexical verb is present, it serves to further specify the action of the transitive event. The secondary lexical verb following *tanian* or *icuwa* must be able to take a location argument, as exemplified below.

(37) Kavalan

<i>tanian-an</i>	<i>ni</i>	<i>abas</i>	<i>m-Rupu</i>	<i>ya</i>	<i>adam</i>	<i>’nay?</i>
where-PV	ERG	PN	AV-shut	ABS	bird	that

‘Where does Abas shut the bird?’

(38) Amis

<i>icuwa-en</i>	<i>isu</i>	<i>mi-na’ang</i>	<i>k-u</i>	<i>riku’?</i>
where-PV	2SG.ERG	AV-pack	ABS-CN	clothes

‘Where do you pack the clothes?’

This restriction on the secondary lexical verb can be ascribed to the structure in (36) and the ditransitive interpretation associated with it. The most natural interpretation of ‘X causes Y to be where’, the meaning of (36), corresponds to a ditransitive event and is thus compatible with verbs that take a location argument.¹⁵

¹⁴ There is a slight difference between (36) and (22). In (22), the theme is base-generated in the specifier of v_{BECOME} , but the theme in (36) moves to this position. We assume that both configurations are possible structures of *-an*. An alternative analysis is that there are two distinct types of v_{BECOME} .

¹⁵ Due to the limitation of space and the focus of the present study, this paper cannot offer a detailed account for the Interrogative Verb Sequencing Construction (IVSC), which contains

Whether there is a lexical verb following *tanian* or *icuwa* in a verbal ‘where’-question, the basic semantic structure of the construction is the same. The interrogative word *tanian* or *icuwa* inherently denotes ‘where’, while the verbal features follow from its merger with the transitive *v*. The proposed syntactic account can provide a straightforward explanation for the fact that when *tanian* or *icuwa* is used as a verb with both an agent argument and a theme argument, it always takes the patient voice marker *-an* or *-en*, but not the agent voice marker, as illustrated below.

- (39) Kavalan
 * *tanian=isu* *tu* *kelisiw-su?*
 where=2SG.ABS OBL money-2SG.GEN
 (Intended for: ‘Where do you put your money?’)
- (40) Amis
 * *icuwa* *kisu* *t-u* *payci?*
 where 2SG.ABS OBL-CN money
 (Intended for: ‘Where do you put money?’)

This is because only v_{CAUSE} , which is phonologically realised as the patient voice marker *-an* or *-en*, can introduce an agent argument or causer and simultaneously take the projection of v_{BECOME} as its complement to denote a change of state caused by some action. In other words, due to the *vP*-shell structure of the patient voice marker, the ergative argument of *tanian-an* or *icuwa-en* must be interpreted as the agent argument that causes the absolutive argument to be somewhere. This interpretation is compatible with questions about the location of the theme argument in a ditransitive event, but not with questions that concern the location where an event takes place. The semantic restriction on the verbal use of *tanian* thus finds a natural explanation.

2.3 Syntactic derivations of interrogative verbs based on ‘how many/much’

In addition to ‘do what’, ‘do how’, and ‘where’, the interrogative words that denote ‘how many/much’ in Kavalan and Amis can also show up as interrogative verbs.

- (41) Kavalan
- a. *kin-tani-an-su=pa* *p<m>ukun* *ya* *sunis?*
 HUM-how.many-PV-2SG.ERG=FUT <AV>beat ABS child
 ‘How many children will you beat?’
- b. *u-tani-an* *na* *wasu* *q<m>aRat* *ya* *saku?*
 NHUM-how.many-PV ERG dog <AV>take ABS cat
 ‘How many cats does the dog bite?’

an interrogative verb followed by a secondary lexical verb. Readers can refer to Lin (2013) for a syntactic analysis of this construction. It is argued that the syntactic relationship between the interrogative verb and the lexical verb in an IVSC is subordination, with the interrogative verb as the main verb.

(42) Amis

a. *pina-en* *ni* *ofad* *k-u* *paysu?*
 how.many-PV ERG PN ABS-CN money
 ‘How much money does Ofad want/take?’

b. *pa-pina-en* *isu* *mi-lawup* *k-u* *wawa?*
 HUM-how.many-PV 2SG.ERG AV-chase ABS-CN child
 ‘How many children will you chase?’

At first sight, the use of ‘how many/much’ as a verb in the patient voice construction does not conform to the analysis of *-an* or *-en* as v_{CAUSE} with v_{BECOME} as its complement and thus should constitute a counterexample to my syntactic approach to the derivation of interrogative verbs. A closer examination of the semantics of verbal *tani* or *pina* reveals otherwise.

A question where *tani* or *pina* is employed as a verb and takes the patient voice marker, e.g., (41) and (42), always implies that the quantity of the affected theme argument will or might change from the perspective of the speaker. For example, the utterance of (42a) is appropriate in a scenario where the speaker expected Ofad to take less money, but the contextual evidence s/he had suggested that he might want more money. The utterance of (42b) also has a similar connotation. Suppose that the addressee of this question had chased three children yesterday and he told the speaker that he intended to chase five children today. In this situation, the speaker could utter (42b) to show his suspicion that the addressee might chase even more children. A more appropriate translation of (42b) might be ‘HOW MANY MORE children will you chase?’ This type of implication is absent in a pseudo-cleft question with *tani* or *pina* as a nonverbal predicate, as illustrated in (43) and (44).

(43) Kavalan

u-tani *ya* *ni-ala-su* *tu* *kelisiw?*
 NHUM-how.many ABS PFV-take-2SG.GEN OBL money
 ‘How much money did you take?’ (Lit. The money that you took is how much?)

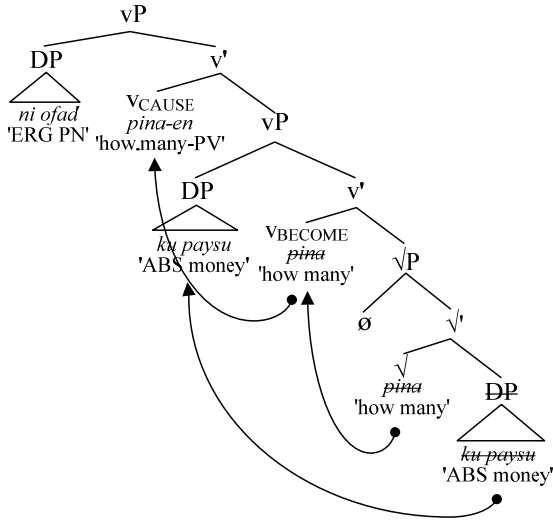
(44) Amis

pina *k-u* *mi-ala-an* *ni* *utay* *a* *payci?*
 how.many ABS-CN MI-take-LA ERG PN LNK money
 ‘How much money did Utay take?’ (Lit. The money that Utay took is how much?)

Compared with (43) and (44), the questions in (41) and (42), where ‘how many’ is suffixed with the patient voice marker, emphasise the intention of the agent and simultaneously imply a change of state, specifically the change of the quantity of the theme argument that might be affected.

The semantics of PV-marked *tani* or *pina* is thus compatible with the syntactic structure assigned to the patient voice marker, or v_{CAUSE} . The proposed syntactic analysis correctly predicts that these two interrogative words can show up as a verb and the interpretation of the derived interrogative verb should conform to the semantics of the vP-shell structure with v_{CAUSE} and its accompanying v_{BECOME} . The tree in (45) demonstrates the derivation of *pina-en* in (42a).

(45) (Partial) derivation for (42a)



The syntactic structure in (45) reflects three important features of verbal *pina* (or *tani*). First of all, the fact that a question with PV-marked *pina* emphasises the intention of the agent can be ascribed to the agent-introducing function of v_{CAUSE} . This is also the reason why verbal *pina* (or *tani*) must occur in the patient voice construction, but not the agent voice construction, as illustrated by the ungrammaticality of the following sentences.

(46) Kavalan

* *u-tani=isu* *tu kelisiw?*
NHUM-how.many=2SG.ABS OBL money
(Intended for: ‘How much money do you want/take?’)

(47) Amis

* *pina* *ci* *ofad* *t-u* *payci?*
how.many NCM PN OBL-CN money
(Intended for: ‘How much money does Ofad want/take?’)

The verbal meaning of *pina* or *tani* is syntactically derived via the merger with the patient voice marker and the vP-shell structure associated with it. As v_{CAUSE} , the patient voice marker can introduce an agent argument or causer and simultaneously take the projection of v_{BECOME} as its complement to denote a change of state caused by some action. The agent voice construction lacks this causative structure.

The second fact that requires an explanation is that a question with *pina-en* or *tani-an* must inquire about the quantity of the theme argument, but not the agent argument. This observation is due to the semantics of the lower vP, where *pina* or *tani* is predicated of the theme argument. The agent argument is introduced by v_{CAUSE} and does not belong to the argument structure of *pina* or *tani*. Moreover, there is agreement between *pina* or *tani* and the theme argument in terms of humanness. When the theme argument is human, *pina* takes an agreement prefix *pa-*, which is derived via *Ca*-reduplication. The agreement prefixes on Kavalan *tani* are *u-* for non-humans and *kin-* for humans. The syntactic configuration in (45), where *pina* and the noun phrase in question exhibit a local relationship in the root phrase, allows this type of agreement to occur. The agent noun

phrase, which is assigned by v_{CAUSE} , is never part of the argument structure of *pina*. Thus, when *pina* is used as a verb and takes the patient voice marker, it is not the quantity of the agent noun phrase that is in question and it cannot agree with *pina* in terms of humanness.

Finally, the vP-shell structure with v_{CAUSE} and v_{BECOME} implicates that there is a causal relation between the two respective sub-events in the upper vP and the lower vP and further implies a change of state. This implicational relation contributes to the unique interpretation associated with *pina-en* or *tani-an*: The quantity of the affected theme argument will or might change from the perspective of the speaker.

The syntactic derivations of verbal ‘what’, ‘where’, and ‘how many’ with the patient voice marker share two formal properties associated with the vP-shell structure of v_{CAUSE} and v_{BECOME} : causal relation and change of state. It should be noted that the labels of v are shorthand notations for formal features like [$\pm$ dynamic] and [$\pm$ change of state]. The head v_{BECOME} denotes [$\pm$ change of state] and its presence in the structures of verbal ‘what’, ‘where’, and ‘how many’ should not be directly and literally interpreted as ‘becoming what, where, or how many’. In all these cases of interrogative verbs with a patient voice marker, the theme undergoes a certain change of state, and the result state, which can be a general state, location, or quantity, is questioned.

Within the framework of Distributed Morphology, only formal features are visible in the syntactic component, while meanings associated with phonological forms are supplied by a separate component, Encyclopaedia, which regulates appropriate use of expressions instead of their grammatical well-formedness (Harley & Noyer 2000). The syntactic derivations of verbal ‘what’, ‘where’, and ‘how many’ are all grammatically well-formed, as they conform to the Head Movement Constraint or the Transparency Condition. Their interpretations follow from the vP-shell structure of v_{CAUSE} and v_{BECOME} , all involving a causal relation and a change of state, even though how the specific interpretations are fine-tuned and conventionalised are still subject to the influence and constraints of Encyclopaedia.

The syntactic mechanisms that are responsible for the derivation of verbal *tani* and *pina* are not peculiar to these two interrogative words, but are shared by the other interrogative verbs. There is no need to resort to lexical stipulation. The grammatical and semantic features of interrogative verbs are the concomitant consequences of the syntactic structure they occur in.

The analysis of *tani* and *pina* as a head that can undergo head movement to v has implications for the typology and structure of interrogative and non-interrogative degree expressions like English *how much* and French *combien*. Two anonymous reviewers point out that there is still no consensus on the structural representation of degree expressions. The controversy lies in whether degree expressions should be analysed as an adjunct or as a functional head of DegP and QP projected above AP (Corver 1997; Doetjes 1997). The fact that *tani* and *pina* can take the patient voice marker might lend empirical support to the functional head analysis, as movement to v must obey the Head Movement Constraint. However, the adjunct properties of degree expressions regarding extraction and non-selection as discussed in Doetjes (1997) should not be ignored. Cross-linguistic differences in the syntactic representation and derivation of degree expressions are worthy of further detailed investigation. It remains to be seen to what extent *tani* and *pina* are similar to and different from their counterparts in other languages regarding their properties as a head or an adjunct.

3 Extension to non-interrogative words

There are at least two advantages of the syntactic account proposed in the preceding sections for Kavalan and Amis interrogative verbs. First, this syntactic account can be extended to non-interrogative words that share similar morphosyntactic and semantic properties with interrogative verbs. In other words, it can capture the overall grammatical system of Kavalan and Amis. Second, since the derivation of interrogative verbs is constrained by established syntactic principles and operations, either universal or language-specific, this syntactic account can make predictions about what interrogative words can and cannot be used as a verb. I will show that the predictions are borne out. This section deals with the first advantage, and section 4 will elaborate on the second advantage.

3.1 Location verbs

The syntactic analysis proposed in the preceding sections can generalise to non-interrogative cases such as locative deictics, which are also realised as verbs in Kavalan and Amis. In the following examples, the locative deictics occur at the sentence-initial position with the patient voice marker *-an* or *-en*, suggesting that they are used as verbs.

(48) Kavalan

- a. *tazian-an-ku* (*pizi*) *ya* *kelisiw-ku*.
 here-PV-1SG.ERG put ABS money-1SG.GEN
 ‘I put my money here.’
- b. *tawian-an-ku* (*pizi*) *ya* *kelisiw-ku*.
 there-PV-1SG.ERG put ABS money-1SG.GEN
 ‘I put my money there.’

(49) Amis

- a. *itini-en* *ni* *panay* (*pateli*) *k-u* *payci*.
 here-PV ERG PN put ABS-CN money
 ‘Panay put the money here.’
- b. *itiraw-en* *ni* *panay* (*pateli*) *k-u* *payci*.
 there-PV ERG PN put ABS-CN money
 ‘Panay put the money there.’

Like their interrogative counterparts, *tanian* and *icuwa*, the locative deictics in (48) and (49) are able to serve as the only verb in a sentence without any lexical verb. Moreover, when used as a verb, they must denote the location of the theme argument in a ditransitive event. When they refer to the location where an event takes place, they are not allowed to take the patient voice marker, as illustrated below.

(50) Kavalan

- * *tazian-an-ku* *m-Rasa* *tu/ya* *sudad*.
 here-PV-1SG.ERG AV-buy OBL/ABS book
 (Intended for: ‘I buy a/the book here.’)

(51) Amis

* *itiraw-en ni utay mi-pacu' t-u/k-u fafuy.*
 there-PV ERG PN AV-kill OBL-CN/ABS-CN pig
 (Intended for: 'Utay kills pigs there.')

The locative deictics exhibit the same grammatical properties and observe the same semantic restrictions as *tanian* and *icuwa*. The syntactic analysis that I have elaborated on for the derivation of interrogative verbs can thus be invoked to explain the syntactic distributions of the locative deictics.

3.2 Manner verbs

Given that (*na*)*quni* 'do what/how' in Kavalan and *maan* 'do what/how' in Amis can undergo head-movement to *v* to derive interrogative verbs, it should not be surprising that their non-interrogative counterparts, e.g., manner deictics and manner adverbial expressions, are also syntactically realised as verbs. The following examples are for illustration.¹⁶

(52) Kavalan

a. *nayau-an-ku.*

that.way-PV-1SG.ERG

'I do (it) in that way.'

b. *nayau-an-na ya sunis-na.*

that.way-PV-3ERG ABS child-3SG.GEN

'He treats his child in that way.'

c. *paqanas-an-ku t<m>ayta ya sudad.*

slow-PV-1SG.ERG <AV>see ABS book

'I read the book slowly.'¹⁷

(Chang 2006:46)

(53) Amis

ha'en-en k-u kamay.

this.way-PV ABS-CN hand

'Make your hand like this!'

The syntactic analysis of the present study can capture the syntactic similarities between manner interrogatives and manner deictics/adverbials in a straightforward way. Their verbal usage is derived because they can be merged with the verb-defining head via licit head movement. This syntactic analysis predicts that the position of an adverbial in a syntactic tree with respect to the position of *v* can determine whether it can be used as a verb. Only adverbials that occupy the head position of a phrase lower than *v* can undergo

¹⁶ The example in (52c) has been re-glossed.

¹⁷ As pointed out by an anonymous reviewer, the embedded event in (24b) and (25b) can be interpreted as the result state, whereas (52c) is not amenable to the same interpretation. Despite the weak semantic connection between (24b)/(25b) and (52c), both exhibit the same structural properties in that the embedded verb occurs in a non-finite complement clause (Chang 2010; Lin 2013).

head movement to *v* and be realised as a verb. This prediction is confirmed by the findings on Formosan adverbial verb syntax in Chang (2006) and Holmer (2010). While low adverbials like manner and frequency expressions are able to take voice markers, high adverbials like epistemic and evaluative expressions cannot be affixed with voice markers.

The two sets of data in (52) and (53), together with the other interrogative sentences discussed so far, suffice to show that there is no absolute underlying distinction between adverbs and verbs in Kavalan and Amis. The notion of adverbs as a distinct syntactic category is also fuzzy in other languages, e.g., Dyirbal, where adverbs modifying verbs show the same inflection as verbs (Dixon 1972). In general, the overlap between adverbial and verbal expressions provides evidence for the proposed syntactic approach, in which roots are not identified with particular lexical categories. The categories of words are defined with respect to the syntactic environments where they occur.

4 Interrogative words that cannot be verbs

The syntactic analysis I have been arguing for can also predict what interrogative words can and cannot be used as verbs in Kavalan and Amis based on the semantics of the voice markers, or verb-defining heads, and established syntactic principles and constraints. Why certain interrogative words in Kavalan and Amis cannot take voice markers and be used as verbs finds a natural explanation in the proposed syntactic framework. The analysis predicts that if an interrogative word must be adjoined to another phrase, it cannot be utilised as a verb as its movement from an adjoined position to *v* would violate the ECP or the Transparency Condition. Also, if the merger of an interrogative word with *v* results in a structure whose interpretation does not correspond to the intended question, that interrogative word should not occur in that verbal environment on the intended interpretation. I have argued that these two considerations rule out the use of adjunct *tanian* or *icuwa* ‘where’ as a verb. In sections 4.1 and 4.2, I show that ‘when’, ‘why’, ‘whose’, and ‘which’ cannot be syntactically realised as a verb in Kavalan and Amis for the same reasons. Section 4.3 discusses why ‘who’ in the two languages cannot be used as a verb.

4.1 ‘When’ and ‘why’

The same structural principles that prevent the derivation of adjunct *tanian* or *icuwa* ‘where’ as a verb can also explain why ‘when’ (Kavalan *qumni* and Amis *ihakuwa*) and ‘why’ (Kavalan *mana* and Amis *naw*) cannot be verbs in Kavalan and Amis. As shown in the following examples, the words that denote ‘when’ and ‘why’ in the two languages cannot take voice markers and be used as verbs.

(54) Kavalan

- | | | | |
|------|-------------------------|-----------------------|--------------------|
| a. | <i>qumnitayta-an-su</i> | <i>ya</i> | <i>ti-buya?</i> |
| | when see-PV-2SG.ERG | ABS | NCM-PN |
| | ‘When do you see Buya?’ | | |
| b. * | <i>qumni-an-su</i> | <i>t<m>ayta</i> | <i>ti-buya-an?</i> |
| | when-PV-2SG.ERG | <AV>see | NCM-PN-LOC |

- c. *mana ala-an-su* *ya* *kelisiw-ku?*
 why take-PV-2SG.ERG ABS money-1SG.GEN
 ‘Why do you take my money?’
- d. * *mana-an-su* *m-ala* *ya* *kelisiw-ku?*
 why-PV-2SG.ERG AV-take ABS money-1SG.GEN
- (55) Amis
- a. *ihakuwa* *ma-alaw* *isu* *ci* *panay?*
 when PV-see 2SG.ERG NCM PN
 ‘When do you see Panay?’
- b. * *ihakuwa-en* *ma-alaw* *isu* *ci* *panay?*
 when-PV PV-see 2SG.ERG NCM PN
- c. *naw* *ma-ulah* *ci* *panay* *ci* *lekal-an?*
 why AV-like NCM PN NCM PN-OBL
 ‘Why does Panay like Lekal?’
- d. * *naw-en* *ma-ulah* *ci* *panay* *ci* *lekal-an?*
 why-PV AV-like NCM PN NCM PN-OBL

Phrases that denote temporal information are typically adjoined to the phrases that they modify. If it is assumed that ‘when’ in Kavalan and Amis is also adjoined to VP or IP, the ungrammaticality of (54b) and (55b) then follows from the syntactic structure of adjunction. For Kavalan *qumni* ‘when’ and Amis *ihakuwa* ‘when’ to move out of an adjoined position would violate the ECP or the Transparency Condition. On the assumption that ‘why’ is directly merged in Spec, CP (Ko 2005) or Spec, INT in the fine structure of CP (Rizzi 2001), the ungrammaticality of Kavalan *mana* ‘why’ and Amis *naw* ‘why’ as a verb in (54d) and (55d) can be attributed to the Transparency Condition.

4.2 ‘Which’ and ‘whose’

Before I explain why ‘which’ and ‘whose’ in Kavalan and Amis cannot be syntactically realised as a verb, it is imperative to consider where the two interrogative words are base-generated. While it has become a common assumption that English determiner *the*, demonstratives *this/that/these/those*, and genitive marker *’s*, occupy the head of DP per Abney’s (1987) DP hypothesis to account for their complementary distribution, whether the same analysis can apply to other languages is controversial because some languages allow a determiner to co-occur with a demonstrative (Bernstein 1997).

Tang (2006) shows that the syntactic distributions of demonstratives and possessives are quite complicated in Formosan languages as they can occur either in a post-nominal position or in a pre-nominal position. The following Kavalan and Amis examples illustrate the two patterns. Note that Amis demonstratives are bound morphemes that must co-occur with case markers or common noun markers. More importantly, they can only occur in a pre-nominal position, as suggested by the ungrammaticality of (57a).

(56) Kavalan

- a. *sudad* *zau*
 book this
 ‘this book’
- b. *zau=ay* *sudad*
 this=REL book
 ‘this book’
- c. *sudad* *zaku*
 book 1SG.POSS
 ‘my book’
- d. *zaku=ay* *sudad*
 1SG.POSS=REL book
 ‘my book’

(57) Amis

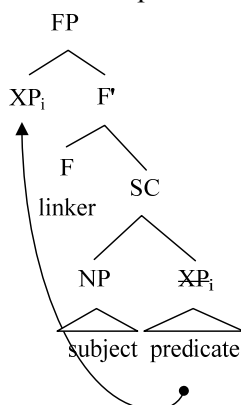
- a. * *c<m>ikay* *wawa* *k-u-ni*.
 <AV>run child ABS-CN-this
- b. *c<m>ikay* *k-u-ni* (*a*) *wawa*.
 <AV>run ABS-CN-this LNK child
 ‘This child is running.’
- c. *wacu* *nu* *maku*
 dog GEN 1SG.POSS
 ‘my dog’
- d. (*nu*) *maku* *a* *wacu*
 GEN 1SG.POSS LNK dog
 ‘my dog’

It should also be noted that when Kavalan and Amis demonstratives and possessives occur pre-nominally, an additional marker =*ay* or *a* is inserted between them and the noun, as shown in (56b), (56d), (57b), and (57d). The occurrence of the marker =*ay* or *a* is forbidden when demonstratives and possessives follow nouns ((56a), (56c), (57c)). The two markers, =*ay* in Kavalan and *a* in Amis, indicate a modification structure in a noun phrase, occurring between the modifier and the modified noun. The relationship of modification is broadly and loosely defined. They function to introduce diverse kinds of modifiers of a noun, including relative clauses, adjectives, numerals, quantifiers, demonstratives, and possessors.

Due to the parallel functions between Kavalan =*ay* or Amis *a* and linkers connecting a noun and its modifier in other languages, I assume that =*ay* or *a* heads its own functional projection, FP, and triggers DP-internal Predicate Inversion. According to den Dikken & Singhapreecha (2004) and Simpson (2001), a noun phrase where the noun and its modifiers are connected by a linker always involves predication. Moreover, the presence of the linker induces predicate inversion. On den Dikken & Singhapreecha’s (2004) account, the noun and its modifier in this construction is base-generated as the subject and predicate of a small clause (SC) respectively. The linker heads its own functional

projection, FP, and prompts the predicate to move to Spec, FP. The derivation is schematically represented by the structure in (58).

(58) DP-internal predicate inversion (den Dikken & Singhapreecha 2004)



Like other modifiers of nouns, *mayni* ‘which’ and *zanitiana* ‘whose’ are followed by =*ay* and must occur before a noun. This is also true of Amis *icuwaay* ‘which’ and *nima* ‘whose’, which can be followed by *a* and must precede a noun, as illustrated below.

(59) Kavalan

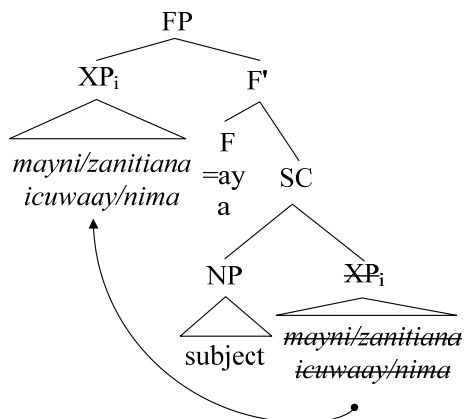
- a. [*mayni*=*ay* *sunis*] *ya* *tayta-an* *ni* *imuy?*
 which=REL child ABS see-PV ERG PN
 ‘Which child does Imuy see?’ (Lit. ‘The person that Imuy sees is which child?’)
- b. [*zanitiana*=*ay* *kelisiw*] *ya* *ala-an*=*ay* *ni* *utay?*
 whose=REL money ABS take-PV=REL ERG PN
 ‘Whose money does Utay take?’ (Lit. ‘The stuff that Utay takes is whose money?’)

(60) Amis

- a. [*icuwaay* *a* *wacu*] *k-u* *ka-ulah-an* *isu?*
 which LNK dog ABS-CN KA-like-LA 2SG.ERG
 ‘Which dog do you like?’ (Lit. ‘What you like is which dog?’)
- b. [*nima* *a* *wacu*] *k-u* *mi-kalat-ay* *t-u* *pusi* *aku?*
 whose LNK dog ABS-CN AV-bite-FAC OBL-CN cat 1SG.GEN
 ‘Whose dog bites my cat?’ (Lit. The thing that bites my cat is whose dog?)

I thus assume that these modifier-like interrogative phrases have the structural representation in (61). They must undergo DP-internal Predicate Inversion, triggered by the presence of F, which is headed by =*ay* or *a*. This explains why ‘which’ and ‘whose’ in Kavalan and Amis must occur in the pre-nominal position.

(61) Structure of ‘which’ and ‘whose’ in Kavalan and Amis



While the fronting of ‘which’ and ‘whose’ before the head noun is obligatory, their non-interrogative counterparts can either move across the head noun or remain in its merge position. An anonymous reviewer suggests that the obligatory fronting of ‘which’ and ‘whose’ to Spec, FP can be attributed to the [+WH]-Agreement requirement proposed by Aissen (1996) for Tzotzil. While the non-interrogative genitive in Tzotzil follows the head noun, *buch’u* ‘who; whose’ must precede the head noun when the entire DP is pied-piped to Spec, CP, as illustrated in (62).

(62) Tzotzil (Aissen 1996:456)

- a. *I-cham x-ch’amal li Xun-e.*
 CP-died A3-child the Xun-ENC
 ‘Xun’s child died.’ (p. 456)
- b. [*Buch’u x-ch’amal*] *i-cham?*
 who A3-child CP-died
 ‘Whose child died?’ (p. 457)
- c. * [*X-ch’amal buch’u*] *i-cham?*
 A3-child who CP-died
 ‘Whose child died?’ (p. 457)

Aissen (1996) argues that *buch’u* ‘who; whose’ in (62b) must move to the specifier of the pied-piped subject DP so that its [+WH] feature can Agree with C[+WH]. On the assumption that Agreement is transitive (Rizzi 1990), after its movement to Spec, DP, *buch’u* ‘who; whose’ in (62b) first Agrees with this subject DP by Spec-Head Agreement and Head-Projection Agreement and then the entire subject DP Agrees with C[+WH]. Transitivity of Agreement licenses the [+WH]-Agreement between *buch’u* ‘who; whose’ and C[+WH]. The Wh-Criterion is thus satisfied in this configuration.

Unlike Tzotzil, Kavalan and Amis are wh-in-situ languages (Lin 2013; Wei 2009). Nevertheless, a [+WH] phrase in the two languages still needs to Agree with C[+WH] to be interpreted as an interrogative. This Agreement is crucial for interpretation, as the wh-words in the two languages can function either as interrogatives or indefinites. On the assumption that wh-phrases move to Spec, CP at LF in Kavalan and Amis, the same explanation proposed by Aissen (1996) for Tzotzil can apply to Kavalan and Amis. In

other words, the locality constraint of the Agree operation is what prompts ‘which’ and ‘whose’ in (61) to obligatorily move to Spec, FP. After the movement, ‘which’ and ‘whose’ Agrees with FP through Spec-Head Agreement and Head-Projection Agreement and then FP Agrees with C[+WH]. Transitivity of Agreement licenses the [+WH]-Agreement between ‘which’/‘whose’ and C[+WH]. Without movement to Spec, FP, the Wh-Criterion would not be satisfied, as ‘which’ and ‘whose’, being embedded inside SC, would not be able to Agree with C[+WH] in any direct or indirect way.

If the structure in (61) is correct, the reason why the interrogative words that denote ‘which’ and ‘whose’ in Kavalan and Amis cannot be used as a verb can be attributed to their position in a specifier. As adjunct *tanian* ‘where’ and *icuwa* ‘where’ are forbidden from moving to *v* due to violations of the ECP or the Transparency Condition, *mayni* ‘which’, *zanitiana* ‘whose’, *icuwaay* ‘which’, and *nima* ‘whose’ are not allowed to move to *v* either. During the course of the derivation, they must move to the specifier of FP headed by *=ay* or *a* via DP-internal Predicate Inversion. Their movement from the specifier position to a c-commanding head would result in an illegitimate configuration that does not conform to either the ECP or the Transparency Condition. Therefore, ‘which’ and ‘whose’ cannot take voice markers and be used as verbs in Kavalan and Amis.

In addition to the syntactic consideration, verbal ‘which’ and ‘whose’ in Kavalan and Amis are also ruled out on semantic grounds. As discussed above, *tanian/icuwa* ‘where’ must take the patient voice marker to be used as a verb, and this is because the patient voice marker, as the lexical realisation of v_{CAUSE} , can assign an agent/causer argument and the semantics of the vP-shell structure with v_{CAUSE} followed by v_{BECOME} is compatible with a question that inquires about the location of the theme argument in a ditransitive event, which is a typical and canonical type of ‘where’-questions. The interrogative words that denote ‘how many’, i.e., *tani* and *pina*, exhibit the same grammatical patterns when they are used as verbs. Due to the semantics of v_{CAUSE} and v_{BECOME} , a question that is formed with verbal *tani* or *pina* receives a unique interpretation where the speaker suspects that the quantity of the affected theme argument might change. The generalisation is that a question with a PV-marked interrogative verb always implies a change of state of the theme argument with respect to the meaning of the interrogative word. In the case of *tanian/icuwa* ‘where’, the location of the theme argument changes because of some action performed by the agent. As for *tani/pina* ‘how many’, what might change is the quantity of the theme argument that will be affected by the action of the agent.

This type of causal relation and change-of-state implicature is absent in a ‘which’-or ‘whose’-question. Take (59a) as an example, ‘Which child does Imuy see?’ The intended meaning of this question does not imply that the theme argument will undergo some change with respect to the meaning of ‘which’, e.g., from ‘this’ to ‘that’. The same reasoning also applies to a ‘whose’-question like (59b), ‘Whose money does Utay take?’ Its intended meaning does not concern change of possession, e.g., ‘the money became whose’. To summarise, the meaning of a ‘which’-question or a ‘whose’-question is incompatible with the syntactic representation of a PV-marked interrogative verb and its associated semantic interpretation. The reason why a ‘which’-question or a ‘whose’-question is not associated with the semantics of a PV-marked interrogative verb is elusive, but the empirical generalisation remains intact.

4.3 ‘Who’

Based on the contention that all the interrogative verbs in Kavalan and Amis are derived in Syntax, their derivation must conform to established syntactic principles and constraints. Conformity to syntactic principles and constraints, however, only leads to grammatical well-formedness, but not appropriate use of expressions. Within the framework of Distributed Morphology, grammatical well-formedness is concerned with the licensing requirements of formal features in the abstract syntactic representation, whereas appropriate use of expressions is regulated by a separate component, Encyclopaedia (Harley & Noyer 2000). This division of labour, as argued by Harley & Noyer (2000), can account for why a nominalised verb can or cannot co-occur with an agent in the possessive form, e.g., the acceptability differences between *the insects’ destruction of the crop* and **John’s growth of tomatoes*. The unacceptability of **John’s growth of tomatoes* is not due to the failure of formal licensing requirements, but results from encyclopaedic anomaly. As *grow* denotes a spontaneous and internally-caused activity, the subject of the nominalised form, *growth*, cannot be construed as an agent. The subject position of *growth* can only be occupied by a theme, e.g., *the tomatoes’ growth*.

The examples in (63) also illustrate the importance of encyclopaedic knowledge in addition to grammatical well-formedness. Given the grammaticality of (63a) and (63b), the unacceptability of **Adultery’s separation of Jim and Tammy Faye* in (63c) is surprising. However, encyclopaedia knowledge of *separation* can account for the contrast. While *the teacher* in (63b) is a true external causer, *adultery* in (63c) is merely a facilitator, just like *John* in **John’s growth of tomatoes*.

(63) Harley & Noyer (2000:365, 366)

- a. Jim and Tammy Faye separated.
Jim and Tammy Faye’s separation
- b. The teacher separated the children.
The teacher’s separation of the children
- c. Adultery separated Jim and Tammy Faye.
* Adultery’s separation of Jim and Tammy Faye

The ungrammatical example occurs in a syntactically well-formed structure just like its grammatical counterparts, but is ruled out by encyclopaedic considerations. In a similar vein, I will argue that the reason why ‘who’ cannot be an interrogative verb in Kavalan and Amis is due to the contradiction between the canonical interpretation of ‘who’ in Encyclopaedia and the interpretation imposed on it in a patient voice construction.

Nicolae & Scontras (2010) argue that ‘who’ in Austronesian languages should be analysed as the interrogative form of a proper noun of the type <e> that denotes individuals based on the following grammatical properties of ‘who’. Like a proper noun, ‘who’ is not able to occur in an existential construction, nor can it be incorporated into a verb. It is used in some languages to question names. It can take a proper noun determiner or a non-common-noun classifier.

A full justification for the analysis of *cima* ‘who’ in Amis and *tiana* ‘who’ in Kavalan as the interrogative form of a proper noun is beyond the scope of the present paper, but I am convinced that this analysis is on the right track due to the following grammatical

properties of *cima* and *tiana*. First of all, when the pivot of an existential sentence is a pronoun or a proper noun, the sentence must be interpreted as a locative construction, not an existential construction (Zeitoun et al. 1999), and this is also true of *cima* and *tiana*. Second, the two interrogative words are used to question one's name. Finally, the non-common noun marker *ci* in Amis is inherent in the interrogative word itself; *tiana* in Kavalan can take the non-common noun marker *ti-*, which is also attached to proper names.

These morphosyntactic properties of *tiana* and *cima* indicate that they should be analysed as the interrogative form of a personal proper name. This further suggests that they are of the semantic type <e>, denoting individuals. The encyclopaedic knowledge of a 'who'-question states that 'who' denotes individuals and the function of a 'who'-question is to ask the addressee to pick out a particular individual. The merger of 'who' with *v* would result in a structure whose semantic interpretation is inconsistent with the canonical meaning of a typical 'who'-question in Encyclopaedia. If 'who' is merged with the patient voice marker *-an* or *-en* in the two languages, the resultant interrogative verb should also be construed as a causative verb like PV-marked 'where' and 'how many', with the theme argument undergoing a change of state with respect to the meaning of 'who'. Although this interpretation is not logically impossible, it does not correspond to the canonical meaning of a typical 'who'-question in Encyclopaedia like 'Who did you hit?', which can be paraphrased as 'X did something to some person and that person is who?'. No change of state of the theme argument concerning the status or meaning of 'who' is involved in a typical 'who'-question. Therefore, verbal 'who' in Kavalan and Amis is ruled out due to the encyclopaedic anomaly instead of violations of licensing conditions or syntactic principles.

Verbal 'who' with the patient voice marker is grammatically well formed, but its coerced interpretation in the patient voice construction contradicts the encyclopaedic knowledge of a typical 'who'-question. On this analysis, the lack of PV-marked 'who' in Kavalan and Amis is merely an accidental gap. A typological study on whether 'who' can be a verb in other Formosan languages might shed light on the validity of resorting to Encyclopaedia as an explanation. If we can find a language where 'who' can be utilised as a verb with a specialised meaning, just like the specialised usage of 'how many' in Kavalan and Amis, this will further corroborate the analysis that distinguishes formal licensing conditions from encyclopaedic coercion of interpretations.

5 Conclusion

The possibility or impossibility of using an interrogative word in Kavalan and Amis as a verb is motivated by syntactic principles/constraints, either universal or language-specific. There is no need to stipulate the syntactic categories of interrogative words in the lexicon. Once the assumption that derivational morphology, e.g., the Kavalan and Amis voice system, must operate in the lexicon is abandoned, the syntactic behaviours of interrogative verbs find a uniform explanation in Syntax. Interrogative words are not lexically specified for syntactic categories. Their syntactic categories and the relevant grammatical patterns follow from the interaction of the following factors: The inherent semantics of interrogative words, the available interpretation of the question where they occur, the verbal structures of the voice markers, and the syntactic principles

and constraints that are cross-linguistically valid, e.g., the ECP or the Transparency Condition.

Finally, the syntactic approach can be extended to non-interrogative words as well and makes correct predictions about what interrogative words can and cannot be used as verbs. It is thus able to depict the overall grammatical system of Kavalan and Amis and proves to be a promising way for future typological research. Interrogative verbs are not unconstrained lexical idiosyncrasies. Instead, their derivations are systematically conditioned in Syntax.

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