The Syntactic Derivation of Interrogative Verbs in Amis[*]

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Abstract: Interrogative words like *maan* 'what; how', *icuwa* 'where', and *pina* 'how many' in Amis have the same morphosyntactic distribution as verbs. The present paper argues that their use as verbs is not due to unconstrained lexical idiosyncrasies, but exhibits consistent syntactic and semantic patterns. Their grammatical properties and restrictions follow from the interaction of the following factors: The inherent semantics of interrogative words, the intended interpretation of the question where they occur, the verbal structures of the voice markers, and the syntactic principles and constraints like HMC and ECP.

0. Introduction: Interrogative Words as Verbs

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-slinguistically.

According to Lin (2010a), interrogative verbs also exist in Kavalan, an Austronesian language in Taiwan, in that they have the same morphosyntactic distribution as verbs. This is also true of another Austronesian language in Taiwan, Amis. Like other verbs, interrogative verbs in Amis occur in the sentence-initial position, take tense/aspect markers, attract pronominal clitics, and are affixed with voice markers.[1] The following sentences are for illustration.[2]

(1)   a.   mi-maan   ci-panay
              AV-what   NCM-PN
              'What is Panay doing?'

[1] The so-called voice system in Austronesian languages roughly refers to the concord between a verb and a nominative-marked noun phrase in terms of the thematic role that this noun phrase plays.
[2] Glossing conventions are as follows: AV – Agent voice; CN – Common-noun marker; EXIST – Existential; FAC – Factual; GEN – Genitive; IMPV – Imperfective; LA – Locative applicative; LNK – Linker; NCM – Non-common noun marker; NOM – Nominative; OBL – Oblique; PFV – Perfective; PN – Proper noun; POSS – Possessive; PREP – Preposition; PST – Past; PV – Patient voice; SG – Singular.

b. ma-maan   cingra
   AV-what   3SG.NOM
   'What happened to him?'

c. na   maan-en   isu   kura   wacu
   PST   what-PV   2SG.GEN   that.NOM   dog
   'What did you do to that dog?'

One of Lin's (2010a) major findings is that the transitivity of interrogative verbs in Kavalan is correlated with the voice markers that are affixed to them. The same observation applies to Amis. Intransitive interrogative verbs are affixed with the agent voice marker, e.g., (1a) and (1b), whereas transitive interrogative verbs are affixed with the patient voice marker, e.g., (1c).

However, there are semantic constraints on the use of interrogative words as verbs. For example, the use of *icuwa* 'where' as a verb in Amis 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 utilize *icuwa* as a verb. Consider the following sentences:

(2)   a.   icuwa-en   isu   ku   payci
           where-PV   2SG.GEN   NOM   money
           'Where did you put the money?'

      b. *icuwa-en   isu   mi-saosi   ku   cudad
           where-PV   2SG.GEN   AV-read   NOM   book
           'Where do you read books?'

The intended meaning of the question in (2a) is to inquire about the location of the theme argument, whereas (2b) is intended to ask where the event of book-reading takes place. Only in the former case can *icuwa* be used as a verb and be affixed with the patient voice marker. In questions concerning where an event takes place, *icuwa* is used as an adverbial expression and occurs in-situ, as demonstrated below.

(3)   a.   ma-alaw   isu   icuwa   ti-lekal
           PV-see   2SG.GEN   where   NCM-PN
           'Where did you see Lekal?'

      b.   icuwa   ma-alaw   isu   ti-lekal
           where   PV-see   2SG.GEN   NCM-PN
           'Where did you see Lekal?'

In the present paper, I propose a syntactic account for the derivation of the interrogative verbs in Amis along the lines of Marantz (1997). This syntactic analysis not only provides a natural explanation for the correlation between the 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 syntac-

tic 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. My findings suggest that the derivations of interrogative verbs are not idiosyncratic, but exhibit a regular pattern and follow syntactic principles and constraints.

Adopting the framework of Distributed Morphology (Marantz 1997), I assume 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), I analyze voice markers as derivational morphemes. I 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 are phonological realizations of the category-defining head v^0 due to the following two reasons. First of all, 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 nominalized words or clauses still possess verbal properties and contain verbal projections (Lin 2010b). Secondly, the voice markers can derive denominal verbs. In (4a), *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 (4b), it occurs in the predicate position and denotes an activity or action associated with the object denoted by its nominal counterpart.

(4)   a. mi-sni'   tu   nanum   i   takid
          AV-pour   OBL   water   PREP   cup
          '(Somebody) pours water into the cup.'
      b. mi-nanum=ho kaku
          AV-water=IMPV 1SG.NOM
          '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).

1.   Syntactic Derivations of Interrogative Verbs

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^0 that the interrogative roots are merged with. Consider the sentences in (1) again. When affixed with an agent voice marker, *maan* 'what' is interpreted as an intransitive predicate, i.e., 'do what' (1a) or 'what happen to' (1b); if it takes a patient voice marker instead, it is interpreted as a transitive predicate, i.e., 'do what to' (1c). The agent voice markers realize intransitive v^0, whereas the patient voice marker is inserted when v^0 is transitive.

Verbalizing heads can 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, e.g., v_{CAUSE}, v_{BECOME}, and v_{DO} (Harley 2009). The merger of a root with different types of v^0 will derive verbs with different Aktionsart properties.

The interpretation of interrogative verbs can be accounted for if different allomorphs of a particular voice marker are conceived of as phonological realizations of different types of v^0. One clear case in point concerns the contrast between (1a) and (1b). When *maan* 'what' 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-* realize two distinct v^0 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 can derive a plain activity verb with an optional motional/purposive/progressive reading, as illustrated by (5a). As for *ma-*, its combination with a root can derive a verb that is interpreted as a result state.[3] (5b) demonstrates this meaning of *ma-*.

(5) a. mi-nanum ci-aki   tu   nanum   (Wu 2006:165)
        AV-water   NCM-PN   OBL   water
        'Aki is going to drink water./Aki is drinking water.'
     b. ma-ruhem=tu   ku   pawli   (Wu 2006:183)
        AV-ripe=PFV   NOM   banana
        'The banana is ripe (just now).'

A derived *ma-* verb is telic and is associated with a result-state or change-of-state interpretation.

Within my framework, *mi-* can be conceived of as an activity-denoting v^0, i.e., v_{DO} and *ma-* can be analyzed as v_{BECOME}, which indicates change of state. The different interpretations of (1a) and (1b), or *mi-maan* and *ma-maan*, lie in the feature clusters of v^0 that *maan* is merged with.

When *maan* undergoes head movement to v_{DO}, which is realized as the agent voice marker *mi-*, the resultant *mi-maan* 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, when the verbalizing head consists of the features, [+change of state] and [-cause], *ma-* is inserted instead. The resultant *ma-maan* is interpreted as a result state and the DP in the Spec, vP thus refers to a theme argument that undergoes the relevant change of state.

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^0 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 emphasizes the intention of the agent. This can be demonstrated by the grammaticality contrast between the following two

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[3] 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 my discussion here.

sentences. The genitive argument in (6a) is an animate causer/agent, but the genitive argument in (6b) is not.

(6)   a. tuniq-en   aku   ku   ti'ti'   aca   (Wu 2006:174)
           soft-PV   1SG.GEN   NOM   meat   a.little
           'I will tenderize the meat a little.'
    b.* tuniq-en   nu   kuwaq   ku   ti'ti'   aca   (Wu 2006:174)
           soft-PV   GEN   papaya   NOM   meat   a.little
           'The papaya will tenderize the meat a little.'

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

    Moreover, the utilization 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.

(7)   ranam-en=ho   (Wu 2006:176)
           breakfast-PV=IMPFV
           'Eat the same thing for the breakfast again!'

When verbs that take the agent voice marker *mi-* are suffixed with the imperfective aspect marker, they are interpreted as progressive. By contrast, the verb in (7), which is suffixed with *-en*, can only receive an iterative reading. This suggests that *-en* is inherently [+telic].

    In my system, the verbalizing head that is realized as *-en* in Amis can be analyzed as v$_{CAUSE}$, which can introduce an agentive causer and implies an endpoint, change of state, or the completion of an action. To capture the inherent semantics of *-en* and its implications, I propose the verbal structure in (8) for verbs that are derived with this suffix.

(8)   The verbal structure of *-en*
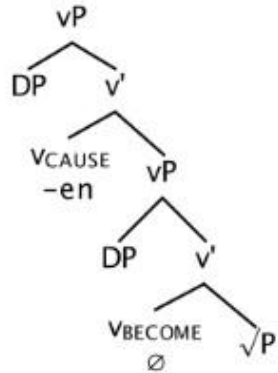
This structure for *-en* is basically the same as the lexical relational structure assigned to English causative deadjectival verbs by Hale and Keyser (1993). I adopt their conception that the vP/VP-

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 (8) thus aptly reflects the status of -*en* as a causative operator that necessarily implicates an endpoint of the action or change of state.

When this suffix is merged with *maan* 'what', the interpretation of the resultant verb, *maan-en*, follows from the structure in (8). The higher v^0 headed by -*en* introduces an agentive causer and implies the existence of an endpoint of the action as indicated by the lower vP whose head introduces a theme argument that 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.'

Note that Amis *maan* can also be used as a noun as in (9), where it occurs in a case-marked position.

(9)	ma-talaw	ci-lekal	tu	maan
	AV-afraid	NCM.SG-PN	OBL	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 (9), it is moved to n^0, the category-defining head for nouns, so that it can further be case-marked. Amis *maan* is an exemplar that shows how the lexical category and interpretation of an interrogative root can vary with and be determined by the syntactic context where it occurs.

It is noteworthy that *what* and *how* share the same root in Amis. Both interrogative words can take the patient voice marker, as illustrated by (1c) and (10) respectively.

(10)	na	maan-en	ni	panay	mi-padang	kisu
	PST	how-PV	GEN	PN	AV-help	2SG.NOM
	'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 *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 (1c) and (10) involve the same verbal derivation with the same category-defining head, v_{CAUSE}.

First of all, both types of questions require an agent or causer that brings about a certain action or event. Secondly, 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 undergoes the action. As for *do how*, the endpoint interpretation emanates from the completion of an action. The deri-

vation for *do how* is thus analogous to transitive *do what*, except that there is a vP complement to the interrogative root in the case of *do how*.[4]

As with transitive *do what*, *do how* is also derived via head movement of the interrogative root to v_{CAUSE}, which is realized as the patient voice marker *-en*, 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 the derivation of *do how* is slightly different from its counterpart in the derivation of *do what*, although both signals the existence of an endpoint.

2.   Semantic Restrictions on the Use of Interrogative Verbs

The syntactic approach delineated above for the derivation of *maan* 'what; how' can also provide a natural explanation for the grammatical properties and syntactic distributions of *icuwa* 'where.' As demonstrated in Introduction, the use of *icuwa* as a verb is restricted to questions about the location of the theme argument in a ditransitive event (2a). Questions about the location where an event takes place cannot utilize *icuwa* as a verb (2b). I argue below that their grammatical properties and restrictions can be derived with reference to the syntactic environment of the interrogative itself. Specifically, like *maan*, *icuwa* serves as a verb when it is selected by a category-defining verbal head little v^0.

The adverbial, in-situ properties of the adjunct use of *icuwa* as in (3) follow from its adjunct status. Not being selected by little v^0, *icuwa* cannot be a verb in these constructions and therefore lack verbal properties. Rather, adjunct *icuwa* takes scope over the entire verb phrase. In (3), the question is intended to inquire about the location where the addressee saw Lekal. Since the scope of *icuwa* in (3) ranges over an event, it is not unreasonable to assume that it is adjoined to vP or IP. The different adjunction positions lead to the word order differences between (3a) and (3b).

After the root *alaw* 'see' moves to v^0, *icuwa* can enter the derivation and be adjoined to vP, and then the derived verb *ma-alaw* 'PV-see' moves to I, deriving the word order of (3a), where *icuwa* follows the verb and the genitive DP. If *icuwa* is adjoined to IP instead, it will occur in the sentence-initial position before the verb. Whether *icuwa* is adjoined to vP or IP, there is no way for it to take the voice marker in v^0, which has been merged with the lexical verb.

Even if *icuwa* is allowed to be adjoined to the projection of the root phrase before the root moves to v^0, it is still forbidden from moving to v^0 due to the Head Movement Constraint (Travis 1984) or the Empty Category Principle (Chomsky 1981). Following Baker (1988), I assume that HMC can be derived from ECP and that head movement of X^0 to Y^0 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 Government and Binding, Baker (1988) proposes that if XP is selected

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[4] Please refer to Lin (2011) for a detailed discussion on the syntactic structure of verb sequencing constructions with an interrogative verb.

by Y, it does not count as a barrier for government from Y after X undergoes head movement to Y.[5] This way, the trace of X can be antecedent-governed.

Suppose *icuwa* is adjoined to the root phrase instead of vP or IP. As an adjunct, its movement to v^0 would violate 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 *icuwa* cannot antecedent-govern its trace. Therefore, when *icuwa* is used to question the location where an event takes place, it can never move to v^0 and take the voice marker. The observation that adjunct *icuwa* cannot be used as a verb finds a natural explanation in my syntactic analysis. The analysis that I propose assumes that interrogative verbs are derived in Syntax and thus their derivations must conform to established syntactic principles and constraints like HMC and ECP.

By contrast, the verbal derivation for *icuwa* in a question that inquires about the location of a theme argument does not incur any violation of syntactic principles and constraints. Consider the syntactic representation in (11) for (2a).

(11)   (Partial) derivation for (2a)
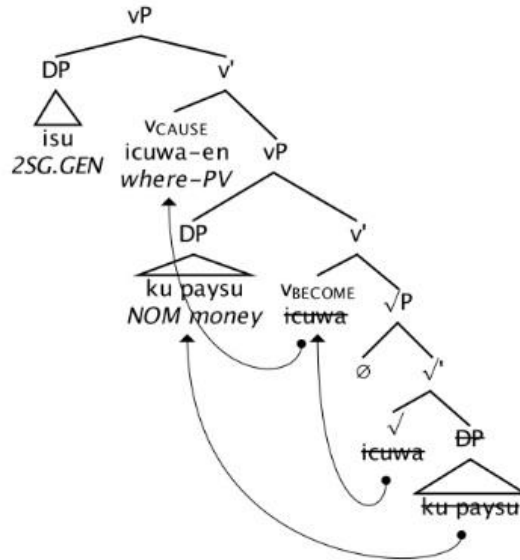
The derivation begins with the merger of √ICUWA with *ku paysu* 'NOM money.' The interrogative root then moves to v_{BECOME} and v_{CAUSE} in a successive-cyclic fashion. The movement of √ICUWA to v_{BECOME} and v_{CAUSE} obeys ECP as each step conforms to the legitimate configuration of head movement. Its lowest copy/trace and the intermediate copy/trace are both properly governed. The higher v^0 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 *-en* in Amis. Together with the inherent locational and interrogative semantics of *icuwa*, the result is a transitive construction in which the location of the theme is in question.

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[5] See Matushansky (2006) for a proposal that views c-selection as a motivation for head-movement within the Minimalist Program.

Specifically, the vP-shell structure with v_{CAUSE} and v_{BECOME} is associated with an implicational relation where the action performed by the agent introduced by v_{CAUSE} must imply an endpoint. In the case of (11), the endpoint interpretation results from the change of state of the theme argument, i.e., its ending up being somewhere. The meaning of (11) 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, as illustrated below.

(12)	icuwa-en	isu	mi-na'ang	ku	riku'
	where-PV	2SG.GEN	AV-pack	NOM	clothes

        'Where did you pack the clothes?'

The secondary lexical verb following *icuwa* must be able to take a location argument. This restriction on the secondary lexical verb can be ascribed to the structure in (11) and the ditransitive interpretation associated with it. The most natural interpretation of 'X causes Y to be where', the meaning of (11), corresponds to a ditransitive event and is thus only compatible with ditransitive verbs that take a location argument.[6]

Whether there is a lexical verb following *icuwa*, the basic semantic structure of the construction is the same. The interrogative word *icuwa* inherently denotes 'where', while the verbal features follow from its merger with the transitive v^0. My syntactic account can provide a straightforward explanation for the fact that when *icuwa* is used as a verb, it always takes the patient voice marker *-en*, but not the agent voice marker. This is because only v_{CAUSE} can introduce an agent argument or causer and take the projection of v_{BECOME} as its complement to denote a change of state caused by some action. In other words, the ergative argument of *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 *icuwa* thus finds a natural explanation.

The syntactic analysis I have been arguing for can also account for the specific interpretation that *pina* 'how many' must receive when it is used as a verb. Consider the following sentence.

(13)	pina-en	ni	ofad	ku	paysu
	how.many-PV	GEN	PN	NOM	money

        'How much money does Ofad want/take?'

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[6] Please refer to Lin (2011) for a detailed discussion on the syntactic structure of verb sequencing constructions with an interrogative verb and for empirical evidence that suggests *icuwa* 'where' in (12) should be analyzed as the main verb.

A question where *pina* is employed as a verb and takes the patient voice marker 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 (13) is appropriate in a scenario where the speaker expects Ofad to take less money, but the contextual evidence s/he has suggests that he might want more money. A more appropriate translation of (13) might be 'HOW MUCH MORE money does Ofad want/take?.'

This type of implication is absent in a pseudo-cleft question with *pina* as a nonverbal predicate, as illustrated in (14).

(14)　　　pina　　　ku　　　mi-ala-an　ni　　　utay　　a　　　paysu
　　　　　how.many　NOM　AV-take-LA　GEN　　PN　　LNK　　money
　　　　　'How much money did Utay take?' (The money that Utay took is how much.)

Compared with (14), the question in (13), where *pina* is suffixed with the patient voice marker, emphasizes the intention of the agent and simultaneously implies a change of state, i.e., the change of the quantity of the theme argument.

The semantics of PV-marked *pina* is thus compatible with the syntactic structure assigned to the patient voice marker, or v_{CAUSE}. The tree in (15) depicts the derivation of *pina-en* in (13).

(15)　　　　(Partial) derivation for *pina-en*
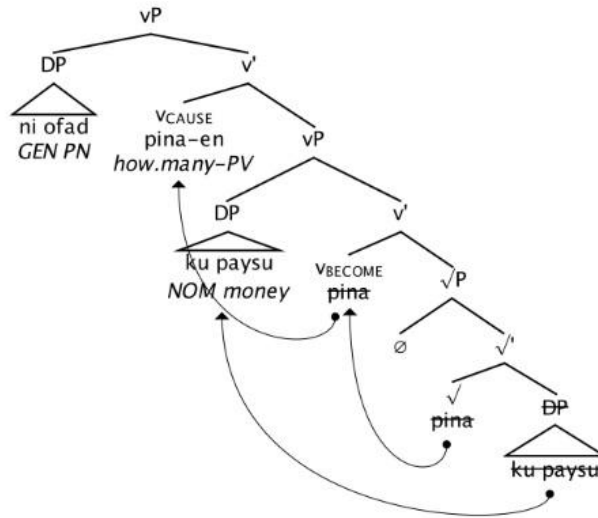
This syntactic structure reflects three important features of verbal *pina*. First of all, the fact that a question with PV-marked *pina* emphasizes the intention of the agent can be ascribed to the agent-introducing function of v_{CAUSE}. This is also the reason why verbal *pina* must occur in the patient voice construction, but not the agent voice construction.

The second fact that requires an explanation is that a question with *pina-en* 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* is predicated of the theme argument. Note that the

agent argument, which is introduced by v_{CAUSE}, is not part of the argument structure of *pina*. Only the theme DP belongs to the argument structure of this interrogative word.[7]

Finally, the vP-shell structure with v_{CAUSE} and v_{BECOME} implicates that there is a causal relation between the two respective 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*: The quantity of the affected theme argument will or might change from the perspective of the speaker.

The syntactic and semantic mechanisms that are responsible for the derivation of verbal *pina* are not peculiar to this interrogative word, but are shared by the other interrogative verbs. There is no need to resort to lexical stipulation, which would only result in the loss of generalization. The grammatical and semantic features of interrogative verbs are the concomitant consequences of the syntactic structure they occur in.

3.   Interrogative Words that Cannot be Used as Verbs

I have demonstrated that the derivation and interpretation of interrogative verbs are conditioned by the semantics of verb-defining heads, or voice markers, and must conform to universal syntactic principles and constraints. In this section, I show that these syntactic and semantic factors rule out the use of *nima* 'whose', *icuwaay* 'which', and *cima* 'who' as verbs in Amis. As demonstrated by the following examples, these three interrogative words cannot be utilized as verbs.

(16)   a. *icuwaay-en   isu   ma-ulah   ku   wacu
            which-PV   2SG.GEN   AV-like   NOM   dog
            'Which dog do you like?'

        b. *ma-nima   kura   wacu
            AV-whose   that.NOM   dog
            'Whose dog is it?'

        c. *ma-cima=tu   ku   tayni-ay
            AV-who=PFV   NOM   come-FAC
            'Who has come?'

Before embarking on this task, let us consider where *nima* 'whose' and *icuwaay* 'which' are base-generated in the syntactic representation.

While it has become a common assumption that the English determiner *the*, the demonstratives *this/that/these/those*, and the 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 like Spanish and Javanese allow a determiner to co-occur with a demonstrative (Bernstein 1997). To account for the non-complementarity of a determiner and a demonstrative in such languages, Bernstein (1997) pro-

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[7] To form a question that inquires about the quantity of an agent noun phrase, a pseudo-cleft question with *pina* as a non-verbal predicate must be utilized instead.

poses that determiners occupy D, whereas demonstratives are base-generated in the specifier of FP, which is the complement to D.

As for Austronesian languages in Taiwan, they do not have overt determiners, but their demonstratives and possessives can co-occur (Tang 2006). This suggests that they do not compete for the same syntactic position. Moreover, they can occur either in a post-nominal position or in a pre-nominal position. Nevertheless, while possessives in Amis can occur in either position, as shown in (17b), demonstratives in this language can only occur in a pre-nominal position (17a).[8]

(17)   a.   kuni   (a)   wawa /   *wawa   kuni
            this.NOM   LNK   child /   child   this.NOM
            'this child'

       b.   (nu)   maku   a   wacu /   wacu   nu   maku
            GEN   1SG.POSS   LNK   dog   /   dog   GEN   1SG.POSS
            'my dog'

It should be noted that when Amis demonstratives and possessives occur pre-nominally, an additional marker *a* is inserted between them and the noun. This marker indicates a modification structure in a noun phrase, occurring between a modifier and the noun that is modified, e.g., between a relative clause and its head noun.

Tang (2006) thus classifies Formosan demonstratives and possessives into two basic types: Post-nominal non-modifier-like demonstratives/possessives and pre-nominal modifier-like demonstratives/possessives. Taking into account their syntactic distributions and the function of the modification markers, she proposes that pre-nominal modifier-like demonstratives in Formosan languages are left-adjoined to FP, which is the complement to D, and pre-nominal modifier-like possessives are generated in the left specifier of NP, which is the complement to F.

The interrogative words that denote *which* and *whose* in Amis behave like pre-nominal modifier-like demonstratives and possessives. As illustrated below, they occur in a pre-nominal position and are followed by the modification marker, *a*.

(18)   a.   icuwaay   a   wacu   ku   ka-ulah-an isu
            which   LNK   dog   NOM   KA-like-LA 2SG.GEN
            'Which dog do you like?' (Lit. What you like is which dog?)

       b.   nima   a   wawa   kura   ma-tulu'-ay
            whose   LNK   child   that.NOM   AV-fall-FAC
            'Whose child fell?' (Lit. The one that fell is whose child?)

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[8] Amis demonstratives are morphologically composed of a case marker, a common noun marker, and a deictic. For example, *kuni* 'this.NOM' consists of *k-* 'NOM', *u-* 'CN', and *ni* 'this.'

I thus assume that *icuwaay* 'which' is the interrogative counterpart of pre-nominal modifier-like demonstratives and is left-adjoined to FP. As for *nima* 'whose', I assume that it is the interrogative counterpart of pre-nominal modifier-like possessives and is left-adjoined to NP.

The reason why the interrogative words that denote *which* and *whose* in Amis cannot be used as a verb can be attributed to their adjunction structure. They are adjoined to FP or NP and their movement from an adjoined position to a c-commanding head would result in an illegitimate configuration where their traces cannot be properly governed. They are forbidden from moving to v^0 due to the ECP violation.

In addition to the syntactic consideration, verbal *icuwaay* and *nima* are also ruled out on semantic grounds. The preceding discussion has revealed 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. For example, in the case of *icuwa* 'where', the location of the theme argument changes because of some action performed by the agent. This type of causal relation and change-of-state implicature is absent in a *which*-question or *whose*-question. For instance, the intended meaning of (18a) 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 (18b). Its intended meaning does not concern change of possession, e.g., 'the money became whose.' To summarize, the meaning of a *which*-question or a *whose*-question is simply incompatible with the syntactic representation of an interrogative verb and its associated semantic interpretation.

Based on my contention that all the interrogative verbs in Amis are derived in Syntax, their derivation must conform to established syntactic principles and constraints. Moreover, the derived verbal structure should be able to be mapped to a compatible semantic structure. To put it in an informal way, the interpretation of the derived structure for an interrogative verb must be consistent with the intended meaning of the question where the interrogative verb occurs. The discussion so far has revealed that all the derived interrogative verbs in Amis must take an agent or theme argument due to the argument-introducing function of v^0, the category-defining head for verbs. This observation is analogous to Baker's (2003:23) syntactic definition of verbs, "X is a verb if and only if X is a lexical category and X has a specifier." This syntactic definition can be re-formulated as a semantic condition: Verbs must inherently be a semantic function that can be applied to individuals or other functions. As a type of verb, interrogative verbs are expected to obey this semantic condition too. In what follows, I will argue that the reason why *cima* 'who' in Amis cannot be an interrogative verb is due to the contradiction between its inherent semantics and this semantic condition.

Nicolae and Scontras (2010) argue that *who* in Austronesian languages should be analyzed 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 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*. 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, and this is also true of *cima*, as illustrated below.

(19)   ira   cima   i   lumaq
         EXIST   who   PREP   house
         'Who is at home?'

Secondly, *cima* is used to question one's name. Finally, the non-common noun marker *ci-* in Amis is inherent in the interrogative word itself.

These properties of *cima* indicate that it should be analyzed as the interrogative form of a proper name. This further suggests that it is of the semantic type <e>, denoting individuals. Its inherent semantic type is incompatible with the semantic type of a verb, which must be a function that can apply to an individual or another function. In other words, the merger of *cima* with v^0 would result in a structure whose semantic interpretation is inconsistent with the intended meaning of a typical *who*-question, where *who* still denotes individuals and the function of the question is to ask the addressee to pick out a particular individual.

If *cima* is merged with the patient voice marker *-en*, the resultant interrogative verb should be interpreted as a causative verb like what I have demonstrated for *icuwa* 'where.' Owing to the vP-shell structure and interpretation associated with v_{CAUSE} and v_{BECOME}, its meaning should denote 'X (agent) does something and this causes Y (theme) to become who', in which the theme argument undergoes a change of state with respect to the meaning of *who*. However, this does not correspond to the intended meaning of a typical *who*-question, where no change of state of the theme argument concerning the status or meaning of *who* is involved. Therefore, *cima* never shows up as a verb in Amis.

4.   Conclusion

The grammatical and semantic properties of interrogative verbs in Amis can be explained by syntactic and semantic 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 voice system, must operate in the lexicon is abandoned, the syntactic behaviors of interrogative verbs find a uniform explanation in Syntax.

Interrogative verbs are not lexically specified for syntactic categories. Their syntactic categories and the relevant grammatical properties follow from the interaction of the following factors: The inherent semantics of interrogative words, the intended interpretation of the question where they occur, the verbal structures of the voice markers, and the syntactic principles and constraints that are crosslinguistically valid.

The syntactic approach I advocate is thus able to depict the overall grammatical system of 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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