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Chang, Y. Henry

Yeh, M. Marie

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HOWs as Syntactic Predicates: Evidence from Tsou and Saisiyat*

Henry Y. Chang and Marie M. Yeh
Academia Sinica | National Tsing Hua University

Abstract
This paper reexamines the cross-linguistic generalization that interrogative HOW words function primarily as adverbs by demonstrating that in two Formosan languages—Tsou and Saisiyat—HOWs operate as full lexical verbs with predicative capabilities. By systematically applying five syntactic diagnostics (primary predication eligibility, theta-role assignment, object topic licensing, clause embedding, and complementation with control/causative verbs), we establish that HOWs in these languages are lexical predicates rather than adjuncts or light verbs. Furthermore, we identify an interrogative split: Measure/Resultative HOWs consistently employ structures of subject-predication in both languages, while Manner/Method HOWs exhibit complementation with obligatory control and voice concord of Saisiyat but either coordination or complementation in Tsou. This structural divergence suggests a grammaticalization pathway from coordination to complementation, with Tsou preserving the conservative pattern, while Saisiyat represents an innovative development. Our findings contribute to the cross-linguistic typology of interrogative words, control theory, voice restructuring phenomena in Austronesian languages, and clause union hierarchies.

Keywords: interrogative HOW, lexical predicate, transitivity, agreement, coordination, complementation, control restructuring

1. Introduction and Background

1.1. The cross-linguistic status of interrogative HOWs

Across the world's languages, interrogative HOW words overwhelmingly function as adverbial elements—that is, adjuncts which modify predicates without functioning as predicates themselves. In English, for instance, HOWs question manner or degree (*How did Mary cook the fish?*) but do not introduce arguments or license object positions. This adverbial pattern is typologically dominant for encoding manner, method, measure, and degree interrogatives. However, a small subset of languages exhibits a strikingly different pattern wherein HOW words function as full verbs. Hagège (2008) documents rare cases where manner interrogatives are encoded as verbal predicates; however, such cases remain exceptional typologically.Formosan languages—the indigenous Austronesian

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languages of Taiwan—stand out as particularly systematic examples of this phenomenon. Extensive previous research has documented verbal HOWs across multiple languages in the family, including descriptions by C. Chang (1996), H. Chang (1997, 2024), Huang et al. (1999), Tsai and M. Chang (2003), Chou (2008), Lin (2015), Yeh (2018a), Hsieh (2019), and Tsai (2024), among others. These foundational studies provide the empirical backdrop for the present investigation.

1.2. Formosan languages and voice systems

The Formosan language set comprises approximately 14 languages spoken by indigenous communities in Taiwan, representing the highest internal diversity within Austronesian and likely preserving archaic features of Proto-Austronesian (Blust 2013). These languages exhibit complex voice/focus systems that have been central to debates about the nature of Philippine-type alignment, with scholars disagreeing on whether voice represents feature agreement/nominative-accusative case alignment or transitivity/ergative-absolutive case alignment (Chen 2025, Aldridge to appear).

Tsou and Saisiyat, the focus languages of this study, belong to different primary subgroups within Formosan. Tsou represents a first-order split from Proto-Austronesian, while Saisiyat groups belong among the Northwest Formosan languages. Both languages retain robust voice systems with morphological marking distinguishing Actor Voice (AV) from non-Actor Voice (NAV, including Patient Voice/PV). Voice morphology interacts with case-marking and word order to determine which argument occupies the syntactically privileged "topic" or "subject" position. This intimate connection between verbal morphology and argument structure becomes significant when examining HOW interrogative roots that integrate into the verbal system.

1.3. The HOW paradigm in Tsou and Saisiyat

In Formosan languages, HOW words figure prominently among wh-words in that they occur consistently as verbs while other wh-words occur either as nominals (e.g., WHO, WHAT and WHERE words) or as adverbials (e.g., WHEN words) (C. Chang 1996, Huang et al. 1999). Tsou and Saisiyat are no exception in this regard. In Tsou, the interrogative HOW paradigm consists of *mainenu* (AV form, glossed as 'do.how.AV') and *yainenu* (PV form, glossed as 'do.how.PV'). These forms transparently consist of HOW roots combined with voice morphology: the prefix *m-* for AV and the root form lacking the AV voice morphology for PV. The existence of distinct voice-marked forms immediately signals that these elements have verbal properties, as voice morphology in Formosan languages canonically attaches to verbal predicates rather than adverbial or functional elements. In Saisiyat, the corresponding forms are *nak'ino'* (AV, 'do.how.AV') and *taka'ino'on* (PV, 'do.how-PV'). Here too, voice morphology (the suffix *-en*[1] for PV) distinguishes different HOW forms. Both languages permit null variants of voice marking in certain contexts, but the availability of overt voice morphology constitutes a critical diagnostic for verbal status. The presence of inflectional marking tied to grammatical function and argument realization sets these elements apart from canonical adverbs, which typically show no such morphological variation.

The semantic range of these HOW words encompasses four main categories with distinct pragmatic and syntactic properties. Manner HOWs question how an action is

[1] The suffix *-en* turns into *-on* in the suffix form due to its phonetic assimilation to its immediately preceding vowel of the root.

performed; Method HOWs question the means or instrument by which an event is accomplished; Measure HOWs question the degree or extent to which an event or state occurs; and Resultative HOWs question the resulting state after an event. This semantic diversity interacts with syntactic structure in revealing ways, as we demonstrate in the analyses below.

1.4. Research questions

Against this background, we address two central questions. First, what type of verbs are HOWs—do they behave as functional verbs (grammaticalized auxiliaries with minimal semantic content), lexical verbs (content-bearing predicates assigning theta-roles), or light verbs (intermediate between functional and lexical categories)? Second, what syntactic structures do HOWs project—do they form coordination structures (symmetric clausal conjunction), subordination (asymmetric embedding without selection), or complementation with control/raising (tight integration with argument-sharing)?

1.5. Organization

The remainder of this paper proceeds as follows. Section 2 presents our data sources and methodology. Section 3 applies five syntactic diagnostics to establish the lexical predicative status of HOWs. Section 4 analyzes the syntactic structures of HOW constructions, contrasting coordination and complementation patterns and examining the voice concord phenomenon in Tsou and Saisiyat. Section 5 explores theoretical implications for clause union typology, control theory, and Austronesian voice systems. Section 6 concludes and outlines directions for future research.

2. Data and methodology

2.1. Data sources

This study draws on multiple complementary data sources for both Tsou and Saisiyat. For Tsou, we conducted group interviews with three or four native speakers to obtain grammaticality judgments and elicit detailed linguistic insights regarding complex syntactic structures. We also consulted the E-Dictionary of Indigenous Languages and drew upon published resources including *Tsou Gospel* (2012), as well as two key monographs: Chang and Pan (2018) and Lin (2022). For Saisiyat, we conducted fieldwork sessions with two native speakers, supplemented by consultation of the E-Dictionary of Indigenous Languages, published narrative materials from Saisiyat Seasonal Festival Teaching Materials, and published resources by Yeh (2018b, 2022). These varied data sources provide authentic examples of the phenomena under investigation drawn from both natural discourse and carefully elicited contexts.

2.2. Methodology

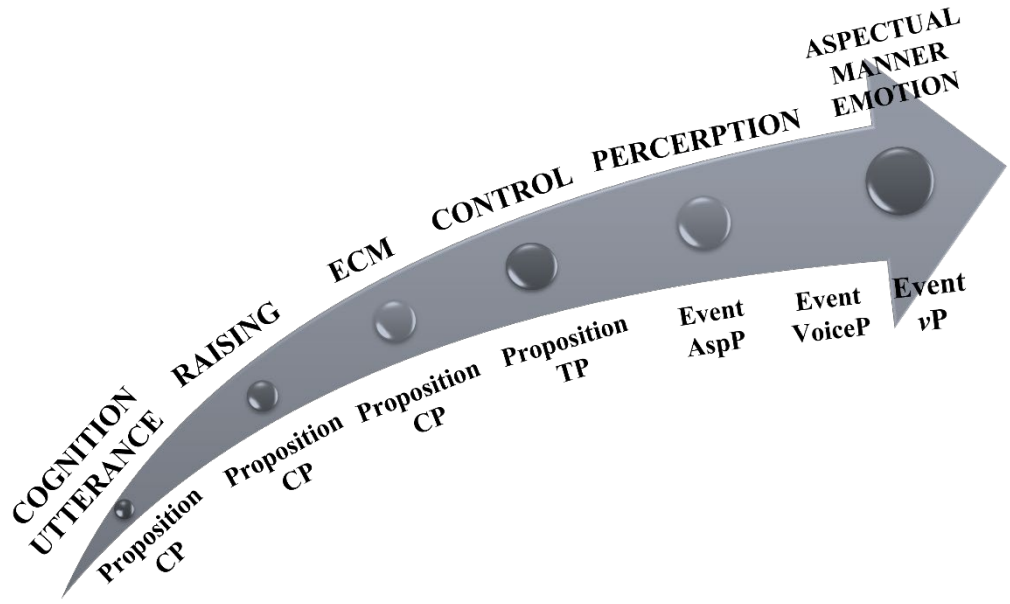
This study investigates two central research questions. First, what is the lexical status of HOW-predicates in Formosan languages—specifically, should these elements be classified as functional, lexical, or light verbs? Second, what syntactic configurations do HOW-constructions instantiate in these languages—do they pattern with control, raising, or represent some distinct structural type? Drawing on extensive evidence from both Tsou and Saisiyat, the analysis probes the fundamental nature of clause union in these systems and seeks to elucidate the formal mechanisms underlying the variation observed in patterns of embedding.

To address the first question regarding the lexical domain of HOW-predicates, our

methodology applies five core syntactic diagnostics from theoretical syntax. These diagnostics—primary predication eligibility, theta-role assignment, object topic licensing, clause embedding capability, and distribution as complements of control or causative verbs—systematically distinguish predicates from adjuncts and differentiate clausal embedding types. Specifically, the diagnostics examine whether a linguistic element can serve as the sole clause predicate, assign theta-roles to its arguments, license objects as topics through voice alternations, select clausal complements, and function as a complement to control or causative verbs.

The theoretical underpinnings of this research are grounded in the licensing theory recently articulated by the first author (Chang 2025), the Unified Theory of Embedding Licensing (*u*TEL). With reference to Givón's binding model (2001, 2009) and Wurmbrand's (2024) account of restructuring, *u*TEL posits that embedded clauses are dependent on their respective matrix clauses, requiring explicit licensing from above. This licensing proceeds along a principled hierarchy: deeper levels of integration correspond to greater structural reduction and higher semantic dependence, as illustrated in Figure 1 below.

Figure 1: Embedding Licensing Hierarchy (Chang 2025)



Underlying this licensing process are three semantic parameters, each capturing a distinct aspect of the matrix person's relation to the embedded clause:

(i) Whether the matrix person is actively or directly involved in carrying out the embedded event;
(ii) Whether the matrix person volitionally engages in the embedded event;
(iii) Whether the matrix person possesses solid knowledge of, or strong commitment to, the truth of the embedded proposition.

These structuring foregrounds the agentivity, volitionality, and epistemic stance of the matrix participant as central to the hierarchical licensing of embedded clauses in the *u*TEL framework.

3. Data and analysis: HOWs as lexical predicates

We now present five syntactic diagnostics establishing that HOWs in Tsou and Saisiyat function as lexical predicates rather than adverbs, functional elements, or light verbs. Each diagnostic provides independent evidence for verbal status; their convergence yields a robust conclusion about categorial assignment.

3.1. Diagnostic 1: Eligibility for primary predication

The most fundamental property distinguishing predicates from adjuncts is the ability to serve alone as the main predicate of a clause. Adverbs and adjuncts cannot fulfill this function—they necessarily modify an existing predicate. Furthermore, both Tsou and Saisiyat HOWs can stand as the sole predicate, taking a subject argument:

(1) *Mi-su* *m-ainenu* *maitan'e*? (Tsou)
NF.AV-2S.NOM AV[2]-do.how today
'How are you doing today?'

(2) *So'o* *nak'ino'* *'ila?* (Saisiyat)
2S.NOM do.how.AV COS
'How come about you? / What happened to you?'

In both examples, the HOW word serves as the main predicate, with the subject (you/he) as its sole argument. There is no additional verbal predicate being modified. This contrasts sharply with adverbial HOWs in languages like English, where how cannot appear without a content-bearing verb. The ungrammaticality of '*How did you?*' demonstrates that adverbial how requires a matrix predicate for licensing. The Formosan data establish that HOWs in these languages lack such requirements, indicating that they project their own predicative structure.

This primary predication capability immediately establishes that HOWs in these languages are categorially verbal rather than adverbial.

3.2. Diagnostic 2: Theta-role assignment

Lexical predicates assign theta-roles (semantic roles such as Agent, Patient, and Theme) to their arguments, whereas functional elements and adjuncts lack this capacity. HOWs in Tsou and Saisiyat demonstrate theta-role assignment through their ability to introduce external arguments in Actor Voice constructions and internal arguments in Patient Voice constructions.

(3) *Os-ko* *yainenu* *si* *ohaesa-su?* (Tsou)
NF.NAV-2S.GEN do.how.PV NOM brother-2S.POSS
'What did you do to your brother?'

(4) *Siya* *niSo'* *taka'ino'-on* *ila?* (Saisiyat)
3S.NOM 2S.GEN do.how-PV COS
'What did you do to him?'

[2] This paper follows the Leipzig Glossing Rules, with the following amendments: AV (Actor Voice), COS (Change of state), NAV (Non-Actor Voice), NF (Non-Future), PLN (Place name), PRT (Particle), PV (Patient Voice), RED (Reduplication).

In these examples, the HOW word takes voice morphology and licenses both an external argument (the Agent, marked with genitive case in NAV forms) and an internal argument (the Patient, marked nominative). The fact that HOWs assign an Agent role to their external argument and simultaneously obligatorily co-occur with a Patient/internal argument demonstrates that they are lexical predicates with agentive semantics, not merely manner modifiers that supervene on existing predicates.

This contrasts with functional verbs such as English be or light verbs like do (in English do damage), which do not assign substantive theta-roles but rather inherit their argument structure from their complements. HOW words in Tsou and Saisiyat independently assign their own theta-roles, showing the independence characteristic of lexical predicates.

3.3. Diagnostic 3: Capable of licensing object topics

Lexical predicates have the capacity to license objects as topics, while functional elements and adjuncts cannot introduce topicalized objects. HOWs in Tsou and Saisiyat demonstrate their status as lexical verbs through their ability to license object topics.

(5) *Os-'o* *payo'-a* *'o* *av'u,* *te-'o* *yainenu?* (Tsou)
NF.NAV-1S.GEN lost-PV NOM dog, FUT-1S.GEN do.how.PV
'As for my dog (which was lost), what should I do with it?'

(6) *Sizaeh* *ila* *paS'ala',* *ta'oeloeh* *taka'ino'-on* *ila?* (Saisiyat)
finish COS celebration head, do.how-PV COS
'As for the head (of the celebration), what should we do with it?'

In these examples, the object (the Theme argument) is advanced to topic position, and the HOW word obligatorily co-occurs with this topicalized constituent. The capacity of *yainenu* and *taka'ino'-on* to introduce and license object topics demonstrates that they are lexical verbs capable of binding objects as arguments. This contrasts with functional verbs or modifiers, which cannot independently establish topical relationships with objects. The licensing of object topics by HOW words shows their fundamental status as lexical predicates with robust argument-licensing capacity, not adjunct-like elements that merely modify existing predicates.

3.4. Diagnostic 4: Clause Embedding Capability

Lexical verbs can take clausal complements, selecting for specific clause types (finite versus non-finite, indicative versus subjunctive, etc.). HOWs in both languages demonstrate this capability by embedding clauses representing the events whose manner or method is questioned:

(7) *Te-ko* *m-ainenu* *ho* *maine'e?* (Tsou)
FUT-2S.GEN AV-do.how COMP go.home.AV
'How will you go home?'

(8) *'am* *nak'ino'* *rima'* *walo'?* (Saisiyat)
FUT do.how.AV go.AV PLN
'How can I get to Tungho?'

In Tsou, the complementizer ho marks the embedded clause *maine'e* 'go home'. In Saisiyat, by contrast, the complement *rima' walo'* 'go to Tungho' directly follows the HOW predicate without an overt complementizer. The embedded clauses denote events, and the HOW predicate questions the manner or means of those events. Crucially, as we demonstrate in Section 4.3, these embedded clauses have specific structural properties—they are tenseless and exhibit voice concord in Saisiyat—indicating that HOWs impose selection restrictions on their complements. These selectional properties are characteristic of lexical predicates.

3.5. Diagnostic 5: Distribution as complements of control or causative verbs

Lexical predicates, but not functional elements or adjuncts, can occur as complements in specific grammatical environments—such as under control verbs or causative verbs—where a full predicate is required. HOW words in Tsou and Saisiyat (e.g., *yainenu*, *taka'ino'-on*) demonstrate their lexical status by occupying complement positions that are otherwise restricted to verbs with argument-structuring capacity.

Control Verb Complement Examples

(9) *Te-mu* *akoev-a* *no* *ti'vo'on-a?* (Tsou)
FUT-2PL.GEN plan-PV COMP do.how-PV
'What would you plan to do?'

(10) *Nimon* *ka-tak'ino'-on* *ila?* (Saisiyat)
2P.GEN would.PV-do.how-PV COS
'What would you like to do?'

Causative Verb Complement Example

(11) *Te-ko* *poa* *m-ainen-u* *na*
FUT-2SG.GEN CAUS.PV AV-do.how NOM
te-ko *pei'i?* (Tsou)
FUT-2SG.GEN cook.PV
'How would you cook it?'

In each case, the HOW word appears as a complement to a higher lexical verb: 'plan' or 'cause'. Such environments only license full verbs with their own thematic structure, not functional or adjunct elements. The ability of *yainenu* and *taka'ino'-on* to occur in these positions demonstrates that they possess the properties of lexical predicates, providing independent argument structure and semantic content.

This distribution is a hallmark of lexical verb status, further distinguishing Tsou and Saisiyat HOW words from functional items that cannot appear in such complement positions.

3.6. Summary: HOWs as lexical verbs

The evidence from Tsou and Saisiyat shows that HOW words in both languages are full lexical predicates, not adverbial modifiers, or functional verbs. They satisfy five core diagnostics of verbal status: eligibility for primary predication, ability to assign theta-roles, capacity to license object topics, selection of clausal complements, and distribution

as complements of control and causative verbs. These properties confirm that HOWs in these languages exhibit genuine verbal syntax and semantics.

HOW words stand alone as main clause predicates, assign agent and patient roles, introduce topicalized objects, embed clauses, and occupy syntactic slots reserved for verbs. Their verbal morphology, argument structure, and syntactic flexibility sharply distinguish them from typical adverbial HOW markers found in languages like English. The convergence of these diagnostics establishes that Tsou and Saisiyat HOWs have all the characteristics expected of lexical verbs, underlining their role as true verbal predicates that structure clauses and license arguments independently.

4. Syntactic structures of HOW constructions

Having established that HOWs in Tsou and Saisiyat function as lexical predicates rather than adverbs or functional elements, we now turn to the second research question: what syntactic structures do these predicative HOWs project? The answer reveals a systematic split based on semantic type and cross-linguistic variation between the two languages.

4.1. The interrogative split: Type I vs. Type II

HOW constructions in both Tsou and Saisiyat exhibit a fundamental structural bifurcation that correlates with semantic interpretation. Type I constructions involve HOWs functioning as primary predicates of a subject, typically with Measure or Resultative interpretations. Type II constructions involve HOWs co-occurring with another lexical verb, representing either coordination or complementation structures, typically with Manner or Method interpretations. Since Type I constructions straightforwardly instantiate simple predication (as demonstrated in Section 3.1), the present analysis concentrates on the more complex Type II patterns, where the structural relationship between the HOW predicate and the associated event predicate becomes theoretically significant.

Type I constructions briefly merit illustration before we proceed to the focal Type II analysis. In both languages, Measure and Resultative HOWs can serve as the sole predicate taking a subject argument:

Tsou Measure HOW (Type I):

(12) *Mi-su=cu* *m-ainenu* *na* *hia* *noana'o* *ho*
NF.AV-2SG.NOM=COS AV-DO.HOW NOM NMLZ STAY.LONG.AV CONJ
axsvxsvxtx *buacou?*
learn.AV speak.TSOU
'How long have you learned speaking Tsou?'

Tsou Resultative HOW (Type I):

(13) *Mo* *m-ainenu* *na* *hia-su* *tosvxtx?*
NF.AV AV-DO.HOW NOM NMLZ-2S.POSS TEST
'How are your tests going?'

Saisiyat Measure HOW (Type I):

(14) *Moyo* *makak-Sekla',* *koza'* *kin-honaehnge:* *ila?*
2PL.NOM RECIP-recognize how.much NMLZ-long COS
'How long have you known each other?'

Saisiyat Resultative HOW (Type I):

(15) *Nisiya* *ka* *kin-'i'iya'eh* *nak'ino'* *'ihan?*
3S.GEN LNK NMLZ-live do.how.AV Q
'How is his life going?'

These Type I examples establish that HOWs can function independently as predicates. The remainder of this section focuses exclusively on **Type II** constructions, where the interaction between HOW predicates and event predicates reveal crucial structural variation.

To determine whether Type II constructions systematically instantiate coordination or complementation, we now apply three particularly robust diagnostics derived from the clause union typology literature.

4.2. Analytical framework: Distinguishing coordination from complementation

To determine whether Type II constructions instantiate coordination, subordination, or complementation, we apply a battery of established syntactic diagnostics derived from the typological and theoretical literature on clause union (Foley and Van Valin 1984, Dahl 1985, Lehmann 1988, Givón 2001, 2009, Cristofaro 2003, Noonan 2007, Haspelmath 2007, Wurmbrand 2001, 2024, Chang 2017, Mayr and Schmitt 2017). The diagnostics include:

(i) Independent tense marking: Coordination permits independent tense specifications in each conjunct, while complementation typically requires tense dependence.
(ii) Global negation scope: In coordination, negation of one conjunct need not scope over the other; in complementation, matrix negation typically scopes over the embedded clause.
(iii) Hierarchical integration: Complementation structures exhibit tighter syntactic integration than coordination, reflected in restructuring phenomena.
(iv) Selection by matrix verb: Complementation involves semantic selection by the matrix predicate; coordination does not.
(v) Assertion/Presupposition status: Coordinated clauses are independently asserted; complements may be presupposed.
(vi) Island effects and binding asymmetries: Coordination creates opaque domains for extraction and binding; complementation under restructuring permits transparency.
(vii) Merging position: Complementation involves a sister relation to the selecting verb; coordination typically involves a higher adjunction site.

We concentrate on three particularly robust diagnostics that yield clear empirical contrasts in our data: (i) tense independence, (ii) voice concord, and (iii) control of the embedded external argument. These three properties converge to distinguish coordination from complementation structures in Tsou and Saisiyat Type II constructions.

4.3. Tsou Type II: Coordination and complementation

Tsou exhibits structural variation within Type II constructions depending on whether the HOW predicate shows intransitive (Actor Voice) or transitive (Patient Voice) morphology. Intransitive Manner HOWs pattern with coordination, while transitive Method HOWs exhibit complementation with control properties.

4.3.1. Manner HOWs as coordination

When Tsou HOWs appear in Actor Voice (AV) forms to express manner interrogatives, they co-occur with the coordination marker *ho*, linking two clauses of equal syntactic status:

(16) *La-ko* *m-ainenu* *ho* *mi-su* *miusnu*
HAB-2SG.NOM AV-do.how CONJ NF.AV-2SG.NOM go.towards.AV
ta *'o'oko* *ho* *aomotx'x?*
OBL children CONJ talk.AV
'How do you talk to children?'

The morpheme *ho* in Tsou functions as a conjunction marker introducing coordinate clauses. Several properties support analyzing this as coordination rather than complementation. First, each clause can independently bear tense/aspect marking, though often the second clause inherits tense from the first for pragmatic economy. Second, the two predicates exhibit **voice non-concord**: the HOW predicate and the event predicate may take different voice morphology without inducing ungrammaticality, indicating that they occupy separate voice domains. Third, the construction permits two separate assertions—'you do how' and 'you talk to children'—characteristic of coordinate structures. The *ho*-linked structure represents a symmetric relation between two predicates sharing a subject argument, consistent with coordination.

4.3.2. Method HOWs as complementation

In contrast, when Tsou HOWs appear in Patient Voice (PV) forms to express method or instrumental interrogatives, they exhibit complementation properties:

(17) a. *Te-ko* *yainenu* *ho* *pei'i* *'e* *yoskx?*
FUT-2SG.GEN do.how.PV COMP cook.PV NOM fish
'How will you cook the fish?'

b. *Te-ko* *yainenu* *ho* *peyaehuf-a*
FUT-2SG.GEN do.how.PV COMP peel.off-PV
ho *mo* *uk'a* *f'uhu?*
SUB NF.AV not.exist knife
'How can you peel off the palm tree without a knife?'

Although the morpheme *ho* appears in these examples as well, three critical diagnostics reveal that the relationship between the HOW predicate and the event predicate differs fundamentally from coordination.

Evidence 1: Tenseless complement

The embedded clause cannot independently bear tense marking. The future tense marker *te-* appears once in the matrix clause and takes scope over the entire construction, but cannot be repeated with the embedded predicate:

(18) a. *Te-ko* *yainenu* *ho* *peyaehuf-a*
FUT-2SG.GEN do.how.PV COMP peel.off-PV
ho *mo* *uk'a* *f'uhu?*
SUB NF.AV Not.exist knife
'How can you peel off the palm tree without a knife?'

b. **Te-ko* *yainenu* *ho* *te* *peyaehuf-a* *ho* *mo*
FUT-2SG.GEN do.how.PV COMP FUT peel.off-PV SUB NF.AV
uk'a *f'uhu?*
not.exist knife

The ungrammaticality of (18b) demonstrates that the embedded clause is structurally smaller than a full TP—it lacks an independent tense projection. This restriction is characteristic of complementation, where embedded clauses are often reduced to VoiceP or *v*P projections, but incompatible with coordination, which permits each conjunct to independently host tense.

Evidence 2: Obligatory voice concord

The embedded predicate must match the voice morphology of the matrix HOW predicate. When the HOW predicate takes Patient Voice, the embedded predicate must also take Patient Voice:

(19) a. *Te-ko* *yainenu* *ho* *peyaehuf-a*
FUT-2SG.GEN do.how.PV COMP peel.off-PV
ho *mo* *uk'a* *f'uhu?*
SUB NF.AV not.exist knife
'How can you peel off the palm tree without a knife?'

b. **Te-ko* *yainenu* *ho* *peyaehuf*
FUT-2SG.GEN do.how.PV COMP peel.off.AV
ho *mo* *uk'a* *f'uhu?*
SUB NF.AV not.exist knife

In (19a), both *yainenu* and *peyaehuf-a* take PV morphology, yielding grammaticality. In (19b), the mismatch between PV *yainenu* and AV *peyaehufu* results in ungrammaticality. This obligatory voice agreement constitutes hallmark evidence for restructuring—the matrix and embedded predicates form a monoclausal domain for voice feature valuation (Paul et al. 2021, Bryant et al. 2023). Voice concord emerges when the embedded VoiceP lacks an independent voice feature specification and must inherit it from the matrix

predicate through an Agree relation. This phenomenon is diagnostic of complementation under restructuring, distinguishing it from coordination where each clause independently determines its own voice morphology.

Evidence 3: Obligatory control of external argument

The matrix external argument introduced by the method HOW controls the reference of the embedded external argument, which appears as a null pronoun (PRO):

(20) *Te-ko*$_i$ *yainenu ho* PRO$_i$ *peyaehuf-a*
FUT-2SG.GEN do.how.PV COMP peel.off-PV
ho mo uk'a f 'uhu?
SUB NF.AV not.exist knife
'How can you (as the Agent) peel off the palm tree without a knife?'

The genitive-marked external argument of the matrix HOW predicate (*-ko* 'you.GEN') obligatorily controls the interpretation of the embedded Agent. This control configuration establishes an asymmetric dependency between matrix and embedded clauses—the embedded clause cannot introduce an independent external argument but must inherit its reference from the matrix subject. Obligatory control is a defining property of complementation structures, contrasting with coordination where each conjunct independently introduces and licenses its own arguments.

The convergence of these three diagnostics—tenselessness, voice concord, and obligatory control—establishes that transitive Method HOWs in Tsou select for tenseless VoiceP complements in an obligatory control configuration. Despite the surface presence of ho, the syntactic structure differs fundamentally from the coordination pattern observed with intransitive Manner HOWs. We analyze ho in these contexts as having grammaticalized from a coordination marker into a complementizer introducing restructuring complements—a diachronic development consistent with broader pathways of clause union evolution (Givón 2001, 2009, Tsai 2007).

Unlike Tsou, which preserves structural variation between Manner and Method constructions, Saisiyat exhibits uniform complementation structures for all Type II constructions, regardless of whether the HOW predicate expresses Manner or Method interrogatives.

4.4. Saisiyat Type II: Uniform complementation

Unlike Tsou, Saisiyat exhibits uniform complementation structures for all Type II constructions, regardless of whether the HOW predicate expresses Manner or Method interrogatives. Both subtypes demonstrate the three diagnostic properties of complementation with obligatory control.

4.4.1. Manner HOWs as complementation

Saisiyat Manner HOWs directly embed event predicates without an overt coordination marker or complementizer:

(21) *S'insangan* *nak'ino'* *mayaka:i'?*
doctor do.how.AV speak.AV
'How does the doctor speak?'

Although superficially simpler than the Tsou construction, this pattern exhibits the full suite of complementation diagnostics, as demonstrated below.

4.4.2. Method HOWs as complementation

Method HOWs in Saisiyat similarly embed event predicates directly:

(22) a. *'am* *nak'ino'* *rima'* *walo'?*
FUT do.how.AV go.AV PLN
'How can we go to Tungho?'
b. *Hini* *'aelaw* *niSo'* *ka-taka'ino'-on* *talek-en?*
this fish 2S.GEN would.PV-do.how-PV cook-PV
'This fish, how would you like to cook?'

The structural properties of both Manner and Method constructions converge on complementation with control, as evidenced by the following diagnostics.

Evidence 1: Tenseless complement

The embedded clause cannot independently bear tense marking. The future/irrealis marker *'am* must appear in the matrix clause only:

(23) a. *Hini* *'aelaw* *niSo'* *ka-taka'ino'-on* *talek-en?*
this fish 2S.GEN would.PV-do.how-PV cook-PV
'How will you cook the fish?'
b. **Hini* *'aelaw* *niSo'* *ka-taka'ino'-on* *'am* *talek-en?*
this fish 2S.GEN would.PV-do.how-PV FUT cook-PV

The ungrammaticality of (23b) demonstrates that the embedded predicate *talek-en* 'cook-PV' cannot host its own tense marker. This tenselessness indicates that the embedded clause is reduced to a VoiceP or *v*P projection lacking TP, consistent with restructuring complementation.

Evidence 2: Obligatory voice concord

The embedded predicate must match the voice morphology of the matrix HOW predicate:

(24) a. *Hini* *'aelaw* *niSo'* *ka-taka'ino'-on* *talek-en?*
this fish 2S.GEN would.PV-do.how-PV cook-PV
'How will you cook the fish?'
b. **Hini* *'aelaw* *niSo'* *ka-taka'ino'-on* *t<om>alek?*
this fish 2S.GEN would.PV-do.how-PV cook<AV>

When the matrix HOW predicate takes Patient Voice (*taka'ino'-on*), the embedded predicate must also take Patient Voice (*talek-en*). Voice mismatch, as in (24b) where AV *t<om>alek* appears under PV *taka'ino'-on*, yields ungrammaticality. This obligatory voice agreement demonstrates that the matrix and embedded predicates form a single domain for voice feature valuation, diagnostic of restructuring. The voice concord pattern in Saisiyat parallels the Tsou pattern documented above, indicating that both languages employ voice agreement as a morphological reflex of syntactic restructuring under complementation (Paul et al. 2021, Bryant et al. 2023,Wurmbrand and Shimamura 2017).

Evidence 3: Obligatory control of external argument

The matrix external argument controls the reference of the embedded external argument:

(25) *Hini* *'aelaw* *niSo'$_i$* *ka-taka'ino'-on* *PRO$_i$* *talek-en?*
this fish 2S.GEN would.PV-do.how-PV cook-PV
'This fish, how will you (as the Agent) cook (it)?'

The genitive-marked Agent *niSo'* 'you.GEN' in the matrix clause obligatorily controls the interpretation of the embedded Agent position. The embedded clause cannot introduce an independent external argument, confirming obligatory control. This argument-sharing configuration is characteristic of complementation, distinguishing it from coordination where each conjunct independently licenses its own arguments.

The convergence of tenselessness, voice concord, and obligatory control establishes that both Manner and Method HOWs in Saisiyat uniformly project complementation structures with restructuring. Unlike Tsou, which exhibits variation between coordination (Manner) and complementation (Method), Saisiyat has generalized the complementation strategy across all Type II constructions.

4.5. Comparative summary: Structural divergence between Tsou and Saisiyat

The analysis reveals systematic cross-linguistic variation in the structural encoding of Type II HOW constructions. These structural properties can be systematized as follows, revealing the systematic divergence:

Table 1: Comparative Summary of Tsou and Saisiyat Type II HOW Constructions

Property	**Tsou**	**Saisiyat**
Manner HOWs	Coordination (with *ho*)	Complementation (no overt linker)
Method HOWs	Complementation (*ho* as complementizer)	Complementation (no overt linker)
Voice Concord	Required in complementation; absent in coordination	Required in all Type II constructions

Tense Independence	Permitted in coordination; prohibited in complementation	Prohibited in all Type II constructions
Control	Obligatory in complementation; absent in coordination	Obligatory in all Type II constructions
Structural Integration	Variable (low in coordination, high in complementation)	Uniformly high (complementation with restructuring)

As this comparison reveals, Tsou preserves a conservative distinction between Manner coordination and Method complementation. Saisiyat, by contrast, has generalized complementation. This structural divergence suggests a diachronic grammaticalization pathway: coordination → complementation.

Tsou preserves a structural distinction between Manner constructions, which employ coordination, and Method constructions, which employ complementation. The morpheme ho appears in both contexts but functions differently: as a coordination marker in Manner contexts and as a complementizer in Method contexts. Saisiyat, by contrast, has generalized complementation across both Manner and Method constructions, exhibiting uniform voice concord, tenselessness, and obligatory control.

This structural divergence suggests a diachronic grammaticalization pathway: **coordination → complementation**. We hypothesize that Proto-Formosan employed coordination for Type II HOW constructions, a pattern conservatively preserved in Tsou Manner HOWs. Saisiyat subsequently reanalyzed the coordinate structure as complementation, triggering restructuring and the emergence of voice concord as a morphological consequence of tight syntactic integration. This diachronic trajectory aligns with cross-linguistic tendencies whereby frequently co-occurring clausal sequences undergo grammaticalization from loose coordination to tight complementation (Lehmann 1988; Givón 2001, 2009, Haspelmath 2007, Cristofaro 2003, Tsai 2007). The presence of an overt linker (*ho*) in Tsou, which can be analyzed as undergoing functional reanalysis from coordinating conjunction to subordinating complementizer in Method contexts, supports this grammaticalization hypothesis.

5. Theoretical implications

This study has established that HOW words in Tsou and Saisiyat function as lexical predicates rather than adverbs, and that they project distinct syntactic structures conditioned by semantic type and mediated by cross-linguistic variation. These findings carry significant implications across multiple theoretical domains, contributing to our understanding of interrogative typology, voice systems, control theory, and clause union hierarchies.

5.1. HOWs as two-place predicates: Agent and event

A central finding of this study is that HOW predicates in Tsou and Saisiyat function as **two-place predicates** taking an agent (external argument) and an event as their two arguments. This analysis aligns with Neo-Davidsonian event semantics, where verbs are analyzed as one-place predicates of events, with thematic relations connecting event participants to events (Parsons 1990). As Parsons demonstrates, on the Neo-Davidsonian

view, verbs denote event predicates, and participants are related to events through thematic roles such as Agent, Patient, and Theme.

Building on this framework, Tsai and Chang (2003) argue that manner adverbials in certain languages can themselves function as one-place predicates of events—requiring an event as their argument. In the present analysis, we extend this insight: HOW predicates in Tsou and Saisiyat operate as two-place predicates that introduce both an external argument (the agent) and select an event complement. Specifically, HOW predicates assign an Agent theta-role to their external argument (as demonstrated by voice morphology alternations in Section 3.2) and simultaneously take an event predicate as their complement (as demonstrated by clause embedding in Section 3.4).

This two-place predicate structure accounts for the full range of syntactic behaviors documented in Sections 3 and 4. In Type II constructions (Manner/Method HOWs), the HOW predicate assigns an Agent role to its external argument and embeds an event-denoting clause as its complement. The embedded event predicate describes the action being questioned (e.g., 'cook', 'go home'), while the HOW predicate questions the manner or method by which that event is executed. Crucially, the matrix Agent obligatorily controls the embedded Agent position (PRO), establishing an argument-sharing configuration characteristic of obligatory control.

The ability of HOW predicates to introduce external arguments distinguishes them categorially from adverbial modifiers, which lack argument-introducing capacity. This argument-introducing function parallels the role of Voice in introducing external arguments via functional heads (Kratzer 1996), confirming that HOWs are full lexical verbs with their own argument structure rather than functional or light verbs that merely inherit argument structure from their complements.

Method HOWs and the structural licensing of patient arguments

A critical dimension of the two-place predicate analysis emerges when we examine **Method HOWs** in conjunction with **Patient Voice (PV) morphology**. As documented in Diagnostic 2 (Section 3.2), Method HOWs taking Patient Voice obligatorily co-occur with patient/object arguments, repeated in (26-27):

(26) *Os-ko* *yainenu* *si* *ohaesa-su?* (Tsou)
NF.NAV-2S.GEN do.how.PV NOM brother-2S.POSS
'What did you do to your brother?'

(27) *Siya* *niSo'* *taka'ino'-on* *ila?* (Saisiyat)
3S.NOM 2S.GEN do.how-PV COS
'What did you do to him?'

In these examples, the HOW predicate not only introduces an Agent (the external argument marked with genitive case) but also obligatorily licenses a Patient argument (marked with nominative case). Superficially, this might suggest that HOWs are **three-place predicates** taking an Agent, a Patient, and an Event as three distinct lexical arguments. However, a closer examination of the data reveals that the patient/object argument is **structurally generated rather than lexically specified**.

The crucial evidence comes from the interaction between Method HOWs and Patient Voice morphology. When a Method HOW takes Patient Voice, it necessarily embeds a transitive event predicate that independently introduces its own internal argument.

Consider again example (17a), repeated in (28) from Section 4.3.2:

(28) *Te-ko* *yainenu* *ho* *pei'i* *'e* *yoskx?*
FUT-2SG.GEN do.how.PV COMP cook.PV NOM fish
'How will you cook the fish?'

In this construction, the patient argument *'e yoskx* 'the fish' is not a lexical argument of the HOW predicate *yainenu* itself. Rather, it is the internal argument of the embedded predicate *pei'i* 'cook'. The HOW predicate does not independently select for this patient argument; instead, it selects an **event complement**, and that event complement happens to be a transitive predicate with its own internal argument structure.

The patient/object emerges through **structural composition** rather than lexical specification: the Method HOW in Patient Voice embeds a Patient Voice complement, and through voice concord and restructuring (as documented in Sections 4.3.2 and 4.4.2), the two predicates form a single extended voice domain. Within this unified domain, the embedded predicate's internal argument is licensed and becomes the topic/subject of the entire construction. Critically, this patient argument is introduced by the **embedded event predicate**, not directly by the HOW predicate.

This analysis preserves the **two-place predicate** characterization of HOWs while accounting for the surface appearance of patient arguments. HOW predicates take two arguments at the lexical level: (i) an external argument (Agent) and (ii) an event complement. When that event complement is itself transitive (i.e., introduces its own internal argument), and when restructuring creates a unified voice domain through complementation, the result is a surface structure in which the HOW predicate appears to co-occur with both an Agent and a Patient. However, the Patient is not a lexical argument of the HOW predicate itself but rather **a structural consequence of embedding a transitive event predicate under Patient Voice**.

This distinction between lexical and structural argument introduction is theoretically significant. **Lexical arguments** are directly selected and theta-marked by a predicate's argument structure; **structural arguments** emerge through syntactic operations such as complementation, restructuring, and voice agreement. The patient/object in Method HOW constructions falls into the latter category: it is licensed by the embedded event predicate and surfaces as the topic/subject due to Patient Voice marking on both the matrix HOW and the embedded predicate.

This analysis has direct implications for rejecting a **three-predicate analysis**. A three-predicate approach would treat HOWs as predicates that lexically select three arguments: Agent, Patient, and Event. Such an analysis would incorrectly predict that HOW predicates can independently assign theta-roles to patient arguments even in the absence of an embedded transitive predicate. However, the data demonstrate that patient arguments only appear when the embedded complement is transitive and when restructuring integrates the two predicates into a unified voice domain. This dependency confirms that the patient is structurally derived, not lexically specified by the HOW predicate.

In sum, Method HOWs in conjunction with Patient Voice structurally introduce patient/object arguments through complementation and voice concord. The patient/object is generated by the syntax—specifically, through embedding a transitive predicate and unifying voice domains via restructuring—rather than being lexically selected by the HOW predicate. This analysis maintains the two-place predicate characterization while

accounting for the full range of argument structures observed in the data.

5.2. Voice as a multifunctional system: Reconciling agreement and transitivity perspectives

The voice concord phenomenon documented in Tsou and Saisiyat contributes directly to ongoing theoretical debates about the nature of voice morphology in Austronesian languages. As noted in Section 1.2, scholars disagree on whether voice in Philippine-type languages represents agreement/nominative-accusative case alignment or transitivity/ergative-absolutive case alignment (Chen 2025, Aldridge to appear). Rather than viewing these perspectives as mutually exclusive, our findings reveal that voice morphology in these languages is **multifunctional**, simultaneously encoding both agreement relations and transitivity distinctions.

Voice as agreement: The nominative-accusative perspective

From the agreement/nominative-accusative perspective, voice functions as a syntactic feature sensitive to φ-features and structural configurations. The obligatory agreement between matrix and embedded voice morphology (documented in Sections 4.3.2 and 4.4.2) demonstrates that Voice participates in standard syntactic mechanisms—Agree and feature valuation—that govern agreement systems cross-linguistically (Carstens and Diercks 2013). Under this view, Actor Voice marks nominative case on the external argument (the Agent), while Patient Voice marks nominative case on the internal argument (the Patient/Theme), yielding a nominative-accusative alignment pattern.

Voice concord arises through feature-sharing mechanisms: when the embedded VoiceP lacks independent voice feature specification (due to structural reduction to VoiceP without independent TP), it must inherit voice features from the matrix predicate through upward or downward Agree (Wurmbrand and Shimamura 2017). This feature dependency creates a unified voice domain across matrix and embedded clauses, where both predicates receive their voice specification from a single Agree operation. This analysis treats voice morphology as an agreement phenomenon, where the voice marker reflects syntactic agreement between a Voice head and the external/internal argument it licenses.

Voice as transitivity: The ergative-absolutive perspective

From the transitivity/ergative-absolutive perspective, voice morphology tracks transitivity properties rather than case alignment per se. Actor Voice marks intransitive predicates (one-place predicates of events taking only an event argument), while non-Actor Voice marks transitive predicates (two-place predicates taking both agent and patient arguments). Under this analysis, the nominative-marked argument in Actor Voice constructions represents the absolutive (S/P) argument (the single argument of intransitive verbs and the patient of transitive verbs), while the genitive-marked external argument in Patient Voice constructions represents the ergative (A) argument (the agent of transitive verbs).

Voice concord in restructuring contexts then reflects merger of two predicates into a single transitivity domain: the matrix predicate's transitivity specification extends to the embedded predicate because they form an integrated unit for purposes of event selection and argument licensing. When a matrix HOW predicate (which is two-place, taking an agent and an event) embeds an event-denoting clause, both predicates participate in a single extended transitivity system. The fact that the matrix predicate is necessarily in

Patient Voice (non-Actor Voice) when the embedded predicate is in Patient Voice indicates that transitivity is computed over the merged predicate structure, not independently for each predicate. This analysis treats voice morphology as a transitivity phenomenon, where the voice marker reflects the predicate's argument structure and valency properties.

Multifunctionality: Voice encodes both agreement and transitivity

The critical insight is that these two perspectives are not contradictory but complementary: voice in Formosan languages is **multifunctional**, simultaneously encoding agreement relations and transitivity distinctions. This multifunctionality explains why voice concord serves as a diagnostic for both structural dependence (the agreement view) and semantic/event-structural integration (the transitivity view).

Consider the Type II constructions in Saisiyat (Manner/Method HOWs), where obligatory voice concord is observed. From the agreement perspective, voice concord reflects feature-sharing via Agree: both the matrix and embedded Voice heads value their voice features from a shared syntactic source due to structural reduction. From the transitivity perspective, voice concord reflects event integration: the matrix HOW predicate (two-place, selecting an event) and the embedded predicate form a single extended event structure where transitivity is computed over the entire merged domain.

Crucially, both interpretations apply to the same morphological facts. The voice marker is simultaneously (i) an agreement morpheme reflecting the syntactic configuration (external/internal argument licensing and feature valuation), and (ii) a transitivity marker reflecting the predicate's argument structure (one-place vs. two-place predicate type). This dual encoding is possible because agreement mechanisms and argument structure properties are informationally linked: feature agreement on Voice typically targets the external or internal argument, and argument structure directly determines which arguments are available for agreement.

The analysis of patient/object arguments as structurally generated (Section 5.1.1) directly supports this multifunctional characterization. When Method HOWs take Patient Voice and embed transitive complements, the resulting patient argument is licensed through the interaction of two systems: (a) the agreement system, which requires voice concord and promotes the internal argument to topic/subject position, and (b) the transitivity system, which integrates the matrix and embedded predicates into a unified event structure. The patient/object is not lexically selected by the HOW predicate but emerges as a structural consequence of how voice morphology operates within restructuring configurations.

The multifunctional status of voice morphology explains why the data support both analytical frameworks. Type I constructions (Measure/Resultative HOWs) employ simple subject-predication structures with uniformly Actor Voice marking, consistent with the agreement view (the single argument receives nominative marking and controls agreement) and the transitivity view (one-place predicates uniformly select Actor Voice). Type II constructions (Manner/Method HOWs) employ two-place predicates with transitivity-driven voice selection, where voice concord simultaneously encodes (a) feature-sharing dependencies reflecting syntactic restructuring, and (b) integrated event structure reflecting semantic dependence.

The cross-linguistic variation between Tsou and Saisiyat further illuminates this multifunctionality. In Tsou, Manner HOWs preserve coordination structures without voice concord, consistent with both perspectives: syntactically, the clauses remain

independent (no feature-sharing requirements, hence no voice concord); semantically, the two predicates remain functionally independent (two separate events, hence no transitivity integration). In Saisiyat, the reanalysis of coordination to complementation entailed structural reduction and event integration, making voice concord obligatory as a reflex of both deeper syntactic binding and unified transitivity specifications.

By treating voice as multifunctional—encoding both agreement features and transitivity properties—we arrive at a unified analysis that explains why voice phenomena serve as diagnostics for restructuring in Austronesian, why voice concord correlates with obligatory control, and why the same voice system appears to support both nominative-accusative and ergative-absolutive analyses. Voice morphology in Tsou and Saisiyat is not simply marking case or simply tracking transitivity; rather, it is a multidimensional grammatical phenomenon encoding structural configurations, argument structure properties, and event semantic integration simultaneously. This multifunctionality reflects the richness and complexity of voice-prominent languages, where a single morphological system simultaneously encodes multiple levels of linguistic organization.

5.3. Control theory and restructuring

The obligatory control and voice concord documented in Tsou Method HOWs and all Saisiyat Type II constructions provide cross-linguistic evidence for the relationship between control and restructuring in Austronesian languages. Following recent work by Paul et al. (2021) on "crossed control" and Bryant et al. (2023) on voice restructuring semantics, we interpret voice concord as a morphological reflex of syntactic restructuring: the matrix and embedded predicates form a single extended verbal domain within which voice features are uniformly valued.

Our findings demonstrate that voice agreement serves as a diagnostic for obligatory control in Austronesian, parallel to how case agreement and tense dependency function in Indo-European control structures (Landau 2004, 2024). The Voice head in these languages plays a role analogous to the T(ense) head in canonical control configurations, creating syntactic dependency that forces argument-sharing between matrix and embedded predicates. Specifically, when the embedded clause is structurally reduced to VoiceP (lacking TP), it cannot independently determine its own voice morphology and must inherit voice features from the matrix predicate. This feature dependency creates an obligatory control configuration: the matrix external argument controls the embedded external argument position (PRO), and both predicates share the same voice specification. The structural licensing of patient arguments in Method HOW constructions (discussed in Section 5.1.1) further illustrates the mechanics of restructuring. When a Method HOW in Patient Voice embeds a transitive complement, restructuring creates a unified voice domain in which the embedded predicate's internal argument is promoted to topic/subject position. This promotion is not a property of the HOW predicate's lexical specification but rather a consequence of voice concord under restructuring: the Patient Voice specification on the matrix predicate percolates down to the embedded predicate, and the embedded predicate's internal argument receives nominative case and becomes the syntactic pivot of the construction. This process confirms that restructuring operates at the level of syntactic structure rather than lexical argument structure.

The three converging diagnostics—tenselessness, voice concord, and obligatory control—establish that HOW complementation in these languages instantiates restructuring, a syntactic configuration characterized by tight clausal integration and

reduced structural size of embedded complements (Wurmbrand 2001, 2024). The absence of independent tense projection (TP) in the embedded clause forces the embedded predicate to depend on the matrix predicate for temporal interpretation. The absence of independent voice specification forces voice feature-sharing under Agree. The absence of independent external argument licensing forces obligatory control. These three dependencies converge to create a monoclausal domain for purposes of voice agreement, tense interpretation, and argument licensing.

This finding contributes to the cross-linguistic typology of control by establishing voice concord as a language-specific diagnostic for restructuring in voice-prominent languages. While Indo-European languages diagnose restructuring through phenomena such as clitic climbing, long-distance passivization, and auxiliary selection (Wurmbrand 2001), Austronesian languages diagnose restructuring through voice agreement. The underlying structural mechanism—merger of matrix and embedded predicates into a single functional domain—remains constant across language families, but the morphological reflex varies according to the language-specific properties of verbal inflection.

5.4. Clause union typology and grammaticalization pathways

The structural contrast between Tsou and Saisiyat illuminates cross-linguistic pathways of clausal integration along established clause union hierarchies (Lehmann 1988, Givón 2001, 2009, Cristofaro 2003, Haspelmath 2007). Our findings position Tsou Manner HOWs at the coordination end of the hierarchy (two relatively independent clauses linked by *ho*) and Saisiyat Manner/Method HOWs at the complementation/restructuring end (tightly integrated monoclausal domain with voice concord and obligatory control).

This structural divergence suggests a diachronic grammaticalization pathway from **coordination to complementation**, wherein Proto-Formosan coordination patterns were preserved in Tsou but reanalyzed as complementation in Saisiyat. The mechanics of this reanalysis likely involved several stages: (i) phonetic reduction or loss of the coordination marker, (ii) reinterpretation of frequently co-occurring clausal sequences as matrix-complement structures rather than symmetric coordination, (iii) structural reduction of the embedded clause from a full TP to a VoiceP , and (iv) emergence of voice concord as a consequence of tight syntactic integration and feature-sharing under restructuring.

This proposed pathway aligns with broader cross-linguistic tendencies whereby loose clause-combining strategies evolve into tighter ones as conventionalization proceeds (Givón 2009, Haspelmath 2007, Cristofaro 2003). The presence of an overt linker (ho) in Tsou, which can be analyzed as undergoing functional reanalysis from coordinating conjunction to subordinating complementizer in Method contexts, provides evidence for the intermediate stages of this grammaticalization process. Tsou thus preserves a conservative distinction between Manner coordination and Method complementation, while Saisiyat represents an innovative system that has completed the grammaticalization pathway, generalizing complementation across all Type II contexts.

The structural licensing of patient arguments provides additional insight into this grammaticalization pathway. In the coordination stage (Tsou Manner HOWs), each predicate independently licenses its own arguments, and there is no unified voice domain. As the construction grammaticalizes into complementation (Tsou Method HOWs and Saisiyat Type II), restructuring creates a single voice domain, enabling the embedded predicate's internal argument to be structurally promoted to topic/subject position under Patient Voice. This structural integration is a hallmark of advanced grammaticalization,

where formerly independent clauses merge into a tightly integrated predicate complex.

5.5. Implications for the unified theory of embedding licensing

The structural patterns documented here provide empirical support for the Unified Theory of Embedding Licensing (*u*TEL) proposed by Chang (2025), which posits that embedded clauses are licensed along a principled hierarchy reflecting degrees of structural reduction and semantic dependence. According to *u*TEL, deeper levels of embedding integration correspond to greater structural reduction and tighter semantic bonding, mediated by three parameters: (i) whether the matrix Agent is directly involved in executing the embedded event, (ii) whether the matrix Agent volitionally engages in the embedded event, and (iii) whether the matrix Agent possesses epistemic commitment to the embedded proposition. HOW constructions instantiate different positions along this licensing hierarchy. Coordination structures (Tsou Manner HOWs) represent **low integration**: the two clauses are independently licensed, each projects its own voice and tense features, and the matrix Agent is not obligatorily involved in the embedded event—the construction merely coordinates two assertions about the subject. Complementation structures (Tsou Method HOWs, Saisiyat Manner/Method HOWs) represent **high integration**: the embedded clause is licensed by and dependent on the matrix predicate, voice features are shared, tense projection is reduced, and the matrix Agent obligatorily controls the embedded Agent role, indicating direct involvement and volitionality in executing the embedded event by a specific manner or method.

This structural gradient aligns with *u*TEL's prediction that higher semantic dependence correlates with greater structural reduction. The interrogative split further supports *u*TEL: Type I constructions (Measure/Resultative HOWs) involve simple scalar or stative predication without embedded event execution, yielding subject-predication structures; Type II constructions (Manner/Method HOWs) involve instrumental or modal relations where the matrix predicate specifies how the embedded event is executed, yielding tighter integration through complementation.

The analysis of patient arguments as structurally generated (Section 5.1.1) provides additional evidence for uTEL. The appearance of patient arguments in Method HOW constructions is not due to lexical specification by the HOW predicate but rather to deep structural integration: when restructuring creates a unified voice domain, the embedded predicate's internal argument becomes accessible for promotion to topic/subject position. This structural accessibility is a direct consequence of the high degree of clausal integration predicted by *u*TEL for complementation with obligatory control.

The cross-linguistic variation between Tsou and Saisiyat represents diachronic movement along the *u*TEL hierarchy, from looser coordination to tighter complementation, driven by increasing conventionalization and semantic bonding between HOW predicates and event predicates. The HOW data thus provide robust empirical validation for the *u*TEL framework, demonstrating how syntactic structure, semantic interpretation, and diachronic change converge to create hierarchical patterns of clausal integration cross-linguistically.

6. Conclusion

This study has demonstrated that interrogative HOW words in Tsou and Saisiyat function as full lexical predicates exhibiting systematic structural variation conditioned by semantic type and grammaticalization stage. Through application of five syntactic diagnostics—eligibility for primary predication, theta-role assignment, object topic

licensing, clause embedding, and distribution as complements of control verbs—we established that HOWs are lexical verbs rather than adverbs or functional elements. Furthermore, we identified an interrogative split: Measure/Resultative HOWs employ simple subject-predication structures (Type I), while Manner/Method HOWs exhibit either coordination (Tsou) or complementation with obligatory control and voice concord (Saisiyat) (Type II).

A central theoretical contribution is the analysis of HOW predicates as **two-place predicates** that introduce an external argument (the agent) and select an event complement. This structure accounts for their full range of syntactic behaviors and distinguishes them categorially from adverbial modifiers. Critically, our analysis demonstrates that when Method HOWs in conjunction with Patient Voice appear to introduce patient/object arguments, these arguments are **structurally generated rather than lexically specified**. As evidenced by Diagnostic 2 (Section 3.2), patient/object arguments in Method HOW constructions emerge through syntactic composition: the Method HOW embeds a transitive event predicate, and through voice concord and restructuring, the embedded predicate's internal argument is promoted to topic/subject position. This structural licensing mechanism argues decisively against a three-predicate analysis, which would incorrectly treat patient arguments as lexically selected by the HOW predicate itself. Instead, the patient/object is a consequence of embedding a transitive predicate within a unified voice domain created by restructuring.

The voice concord phenomenon provides novel evidence supporting both the agreement/nominative-accusative and transitivity/ergative-absolutive analyses of Austronesian voice systems (Chen 2025; Aldridge to appear), demonstrating that voice morphology simultaneously encodes agreement features and transitivity distinctions. The structural generation of patient arguments further illustrates this multifunctionality: voice morphology operates simultaneously as an agreement system (licensing the internal argument as topic/subject) and as a transitivity system (integrating matrix and embedded predicates into a unified event structure).

The structural divergence between Tsou (which preserves coordination for Manner HOWs) and Saisiyat (which has generalized complementation) suggests a grammaticalization pathway from coordination to complementation, consistent with broader clause union hierarchies (Givón 2001, 2009, Cristofaro 2003). These findings validate the Unified Theory of Embedding Licensing (uTEL), showing how syntactic structure, semantic interpretation, and diachronic change converge to create hierarchical patterns of clausal integration. The structural licensing of patient arguments in complementation structures provides direct evidence for uTEL's prediction that deeper integration correlates with greater structural reduction and tighter semantic bonding.

This research enriches the cross-linguistic typology of interrogative words, contributes to debates about voice systems and case alignment in Austronesian languages, establishes voice concord as a diagnostic for restructuring in voice-prominent languages, and illuminates pathways of grammaticalization from coordination to complementation. By demonstrating that patient/object arguments in Method HOW constructions are structurally derived rather than lexically specified, we provide crucial evidence for distinguishing between lexical and structural argument introduction in voice-prominent languages—a distinction with far-reaching implications for theories of argument structure, voice morphology, and clause union.

Future research should extend this analysis to other interrogative words (WHAT, WHERE, WHY), provide formal derivations of voice concord mechanisms and structural

patient licensing, examine corpus frequency patterns to test the grammaticalization hypothesis, and investigate the compositional semantics of HOW+complement constructions within Neo-Davidsonian event structure frameworks. Such investigations will deepen our understanding of how interrogative words, voice morphology, and clause union interact across the world's languages, and how syntactic structures generate arguments beyond the lexical specifications of individual predicates.

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