TWO TYPES OF WH-ADVERBIALS
A TYPOLOGICAL STUDY OF HOW AND WHY IN TSOU

Wei-Tien Dylan Tsai & Melody Yayin Chang
National Tsing Hua University

This paper presents cross-linguistic arguments for distinguishing between two types
of wh-adverbials: causal how, causal why, and epistemic why pattern together in
taking an IP scope, functioning as operators, whereas method how, manner how, and
purpose why pattern together in taking a VP scope, functioning as predicates of
underlying events. For the former group, there is always a cause-effect relation
underpinning their syntactic distributions across languages, which is semantically
realized as a causative predicate taking two events as its arguments, i.e., a cause event
and an effect event. In a causal question, it is the cause event that is bound by the
question operator; in a resultative question, the effect event is bound instead. For the
latter group, they surface as conjuncts of main predicates in Tsou, which in turn
argues for a neo-Davidsonian treatment of adjunct association in syntax (Parsons
1990). The fact that a conjunctive how can be construed as either a manner/method
question or a resultative question in Tsou further argues for an independent semantic
module in grammar in the vein of Culicover and Jackendoff (1997).

Keywords: Tsou, Austronesian Syntax, Wh-adverbials, Wh-adjuncts,
Neo-Davidsonian Approach, Syntax-Semantics Interface

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0. Introduction

When we think of wh-adverbials such as how and why, we tend to think of them as adjuncts of certain syntactic projections. However, when we take a closer look at their syntactic distributions and semantic interpretations, there is actually a disparity between wh-adverbials: Namely, one group behaves more in line with typical VP-modifiers, i.e., as predicates of underlying events, whereas the other group patterns with matrix predicates taking a propositional complement. In this paper, we show that in Tsou, the former group surfaces as conjuncts of main predicates in syntax, which is reminiscent of the Neo-Davidsonian treatment of manner and instrumental adverbials (Parsons 1990). The latter group, on the other hand, surfaces as matrix predicates through complementation of an effect event.

Before turning to Tsou, a general discussion of the nature of this adverbial disparity is in order. Chinese and English data are employed to illustrate the contrasts. First consider the two types of Chinese how: As in (1a), when zenme, a Chinese how, follows a modal, it gets a method reading, which can mean either “by what means” or “in which way”. By contrast, when zenme precedes a modal, as in (1b), it gets a causal reading, and is interpreted in much the same way as how come in English (Tsai 1999c):

(1) a. Akiu keyi zenme qu Taipei? (method how)
   Akiu can how go Taipei
   “How can Akiu go to Taipei?”

   b. Akiu zenme keyi qu Taipei? (causal how)
   Akiu how can go Taipei
   “How come Akiu could go to Taipei?”

The disparity also occurs when we take Chinese why into consideration. As in (2a), wei-le shenme 'for what' typically appears after a modal, and has a very strong tendency to be interpreted as purposive. By contrast, (2b) shows that weishenme, a reduced form of wei-le shenme, typically appears before a modal, and can only be interpreted as causal:

(2) a. Akiu keyi wei-le shenme ci-zhi? (purposive why)
   Akiu can for-Prf what quit-job
   “For what purpose can Akiu quit his job?”
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b. *Akiu weishenme keyi ci-zhi?* (causal *why*)
   Akiu why can quit-job
   “Why could Akiu quit his job?”

In terms of semantics, we may tease them apart with an individual-level predicate. As evidenced by the contrast between (3a) and (3b), method *how* does not get along with an epistemic statement like *the sky is blue*, but causal *how* does:

(3)  a. ?? How is the sky blue? (method *how*)
    b. How come the sky is blue? (causal *how*)

The contrast between (4a) and (4b) further reveals that a purposive question, just like a method question, is incompatible with the epistemic statement:

(4)  a. ?? For what purpose is the sky blue? (purposive *why*)
    b. Why is the sky blue? (epistemic *why*)

It is instructive to note that (3b) has a “change-of-state” flavor, which is absent in (4b), an epistemic question in the sense of Bromberger (1992): When we ask *how come the sky is blue?*, we want to know what results in the sky's being blue, or simply put, why the sky has become blue. The same interpretation is not available with (4b).1

Therefore, it seems reasonable to suggest that (3b) presupposes a cause event, in addition to the presupposition that the sky is blue, which is shared by its epistemic counterpart (4b). The causal-epistemic distinction is also attested in Chinese, as evidenced by the contrast between (5a) and (5b):

(5)  a. *tiankong zenme shi lande?*  
    sky how be blue  
    “How come the sky is blue?”

b. *tiankong weishenme shi lande?*

---

1 It should be noted that with a stage-level predicate, English *why* can be either causal, purposive, or epistemic, as in (1a-c) respectively:

(i)  Why did Akiu go to Taipei?
   a. How come Akiu went to Taipei? (causal *why*)
      Answer: Because his father was ill.
   b. For what purpose did Akiu go to Taipei? (purposive *why*)
      Answer: He went to Taipei to buy a rare book.
   c. For what reason did Akiu go to Taipei? (epistemic *why*)
      Answer: He just likes to travel around.

The first two readings, as seen above, are blocked in the presence of an individual-level predicate.
Similarly, (5a) expresses “change-of-state”, asking why the sky has become blue. By contrast, (5b) is a pure epistemic question, asking why the sky is blue.

Tsou, an Austronesian language spoken in the southern part of Taiwan, represents the dichotomy between the two types of \textit{wh}-adverbials in a most interesting way: That is, \textit{wh}-adverbials are inflected with voice agreements, acting more in line with a syntactic predicate rather than an adjunct. As exemplified by (6a), \textit{mainenu} 'how', is conjoined to the main predicate with the conjunction \textit{ho} 'and',\(^2\) while serving as a modifier of the hitting activity in regard to semantics. We therefore have a mismatch between syntax and semantics at hand:\(^3\)

\[(6) \quad \text{a. m-i-ta} \quad \text{m-ainenu} \quad \text{ho} \quad m-i-ta \quad \text{eobak-o} \]
\hspace{1cm} AV-Rea-3S \hspace{1cm} AV-how \hspace{1cm} and \hspace{1cm} AV-Rea-3S \hspace{1cm} hit-AV
\hspace{1cm} ta-Mo'o \quad 'e-Pasuya?
\hspace{1cm} Obl-Mo'o \hspace{1cm} Nom-Pasuya
\hspace{1cm} “How did Pasuya hit Mo'o?”

\hspace{1cm} b. m-i-ta \quad m-ainenu \quad ci \quad m-i-ta \quad eobak-o

\(^2\) \textit{Ho} is a full-fledged conjunction in Tsou: It may conjoin DPs, VPs, or IPs, as evidenced by (i), (iia-c), and (iii) respectively (see also M. Chang 2003):

\begin{enumerate}
\item (i) DP conjunction:
\textit{m-oh-cu} \textit{uhne Tfuya} \textit{'o-am} \textit{ho ino ho ohaesa.}
\textit{AV-Rea-Perf go} \textit{Tfuya} \textit{Nom-father and mother and younger sibling}
\textit{‘Father, mother and younger siblings have gone to Tfuya.’}
\item (ii) a. Active VP conjunction:
\textit{m-i-'o-cu} \textit{uh to-hopo ho oengutu.}
\textit{AV-Rea-I-Perf go Obl-bed and sleep}
\textit{‘I went to the bed and slept.’ (Tung 1964: 121)}
\item b. Passive VP conjunction:
\textit{i-ta} \textit{eau} \textit{ho ana} \textit{'o-'ufi.}
\textit{NAV-Rea-3S get.PV and eat.PV Nom-rice cake}
\textit{‘He took (the rice cake) and ate (it).’}
\item c. Stative VP conjunction:
\textit{m-o} \textit{na'no smuu ho lingki} \textit{'o-ceonu.}
\textit{AV-Rea very watery and muddy Nom-road}
\textit{‘The road is very watery and muddy.’}
\item (iii) IP conjunction:
\textit{m-i-ta} \textit{yu} \textit{e-Pasuya ho m-i-ta moyomo.}
\textit{AV-Rea-3S talkative Nom-Pasuya and AV-Rea-3S drunk}
\textit{‘Pasuya is talkative when he was drunk.’}
\end{enumerate}

\(^3\) AV: actor/active voice; Comp: complementizer; Conj: conjunction; Inc: inchoative aspect; Irr: irrealis tense; Loc: locative case; MM: modifier marker; NAV: non-actor voice; Nom: nominative case; Obl: oblique case; Prf: perfective aspect; PV: patient/passive voice; Rea: realis tense.
Despite its syntax, (6a) does not have a conjunctive reading such as “How is Pasuya and Pasuya hit Mo’o?”. Rather, it is interpreted as “What is the method of the event in which Pasuya hit Mo’o?”. The following conclusion is inevitable: Although the subject of syntactic predication for mainenu ‘how’ is Pasuya according to the actor voice inflection, the subject of its semantic predication is the hitting event.

Mainenu ci 'how come', on the other hand, takes the hitting event as its complement, as in (6b). The activity modification thus leads to the method reading of (6a), whereas the event complementation results in the causal reading of (6b).

In this paper, we would like to argue that the syntax-semantics mismatch with method and manner expressions is only apparent, and that the neo-Davidsonian design of adjunct association à la Parsons (1990) has actually “surfaced” in Tsouic syntax: Namely, they are represented as conjuncts of main predicates in syntax as well as in semantics. It is also claimed that, despite variations on the surface, there is a cross-linguistic generalization that causal and epistemic wh’s scope over eventualities, behaving like an operator, while method and purpose wh’s scope over activities, behaving like a predicate. As we will demonstrate below, this semantic division has close bearing on the distinct syntactic distributions of the two types of wh-adverbials.

Our presentation is organized as follows: Section 1 and 2 give a preview of the morpho-syntactic makeup of Tsouic how and why respectively. In section 3, we present a neo-Davidsonian treatment of the how-why alternation in Tsou, based on the intuition that why-questions always involve causation between two eventualities. In section 4, an agentivity restriction on how-questions is brought up to show that modification on activities results in some interesting property which lends support to our analysis. Section 5 concludes this paper.

1. The Whys of How

There are altogether four ways to construct a how-question in Tsou: Firstly, we may appeal to the conjunction strategy mentioned above. The interpretation, rather surprisingly, is ambiguous between method how and causal how, as illustrated by (7a,b) respectively:

\[
\begin{align*}
(7) & \quad m-i-ta \quad m-ainenu \quad ho \quad m-i-ta \quad eobak-o \\
& \quad AV-\text{Rea-3S} \quad AV-\text{how} \quad \text{and} \quad AV-\text{Rea-3S} \quad \text{hit-AV}
\end{align*}
\]
Therefore, if (7) is construed as a method question, the answer could be something like (8a). On the other hand, when (7) is causal, (8b) becomes a possible answer:

(8) Answer: a. \(i-ta\) \(titha\) \(ta-s'o\text{'}fu\) \(ho\)

\[
\begin{array}{ll}
\text{NAV.Rea-3S} & \text{use.PV} \\
\text{Nom-staff} & \text{and} \\
\end{array}
\]

\[
\begin{array}{ll}
\text{NAV.Rea-3S} & \text{hit-PV} \\
\text{Obl-Pasuya} & \text{Nom-Mo'o} \\
\end{array}
\]

“Mo’o was hit by Pasuya by using a staff.”

b. \(i-ta\) \(t'o\text{'}plikvi\) \(ta\) \(Mo'o\) \(e\) \(Pasuya\).

\[
\begin{array}{ll}
\text{NAV.Rea-3S} & \text{slap.PV} \\
\text{Obl-Mo'o} & \text{Nom-Pasuya} \\
\end{array}
\]

“Pasuya was slapped by Mo’o.”

In addition, the same construction may produce either a resultative question or a descriptive question:

(9) \(m-i-ta\) \(m\text{-}ainenu\) \(ho\) \(m-i-ta\) \(peayofu\) \(e\) \(Pasuya\)?

\[
\begin{array}{llll}
\text{AV-Rea-3S} & \text{AV-how} & \text{and} & \text{AV-Rea-3S} \\
\text{Nom-Pasuya} & \text{run} & \text{Nom-Pasuya} \\
\end{array}
\]

a. “What is the result of Pasuya's running?”

b. “What is the resultant state of Pasuya's running?”

This ambiguity is best illustrated by the following two distinctive answers to (9a,b):

(10) Answer: a. \(m-i-ta\) \(yaa\) \(ongko\).

\[
\begin{array}{ll}
\text{AV-Rea-3S} & \text{get} \\
\text{rank} & \text{“He got a rank (among the top runners).”} \\
\end{array}
\]

b. \(m-i-ta\) \(atutumzo\) \(peayofu\).

---

\(^4\) Note that changing the voice of Tsouic \textit{how} into passive doesn't seem to make a difference, as evidenced by the corresponding \textit{yainenu}-question:

(i) \(i-ta\) \(y\text{-}ainenu\) \(ho\) \(i-ta\) \(eobak-a\) \(ta\) \(Pasuya\) \(e\) \(Mo'o\)?

\[
\begin{array}{llll}
\text{NAV.Rea-3S} & \text{PV-how} & \text{and} & \text{NAV.Rea-3S} \\
\text{hit-PV} & \text{Obl-Pasuya} & \text{Nom-Mo'o} \\
\end{array}
\]

a. “How was Mo'o hit by Pasuya?”
AV-Rea-3S weary run
“He ran wearily.”

Another way to construct a how-question is to employ a nominalization strategy, as shown by the following gerundive constructions. The subject NP containing the gerund, as delimited by the nominative case marker *na-*, is predicated upon by *mainenu* and *yainenu* in (11a) and (11b) respectively (cf. M. Chang 2002):

(11) a. *m-o m-ainenu na-[hiaebak-o ta-Mo'o to-Pasuya]?
   AV-Rea AV-how Nom way hit-AV Obl-Mo'o Gen-Pasuya
   “How was the way/degree of Pasuya's hitting Mo'o?”

   b. *i-si y-ainenu na-[hia eobak-a ta-Mo'o to-Pasuya]?
   NAV-Rea-3S PV-how Nom way hit-PV Obl-Mo'o Gen-Pasuya
   “How was the way/degree of Pasuya's being hit by Mo'o?”

This construal typically produces a method or degree reading, with the latter best translated into *How bad did Pasuya hit Mo'o?* in English.

Thirdly, Tsouic how may predicate upon a relative clause which is internally headed by an adverbial noun *hia* 'way'. Here the embedded subject *Pasuya* differs minimally from its counterpart in (11a,b) in carrying a nominative case marker 'e, rather than a genitive case marker to:

(12) a. *m-i-ta m-ainenu na-[m-i-ta hia eobak-o ta-Mo'o 'e-Pasuya]?
   AV-Rea-3S AV-how Nom AV-Rea-3S way hit-AV Obl-Mo'o Nom-Pasuya
   “How was the way in which Pasuya hit Mo'o?”

   b. *i-ta y-ainenu na-[i-ta hia eobak-a ta-Mo'o 'e-Pasuya]?
   NAV-Rea-3S PV-how Nom NAV-Rea-3S way hit-PV Obl-Mo'o Nom-Pasuya
   “How was the way in which Pasuya was hit by Mo'o?”

   b. “How was it that Mo'o was hit by Pasuya?”
Moreover, tense modals such as *mita and *ita make their presence here, making *hia part of the finite clause rather than a separate head. Therefore, the matrix subject of (12a,b) should be analyzed as a relative instead of a gerund. It is also instructive to note that causal readings are ruled out for both (11) and (12), whereas the method, manner, and degree readings are available.

Finally, *mainenu may predicate upon an ordinary complex NP, as in (13a), producing a resultative reading, very much like English *how in *How have you been lately? or its Chinese counterpart in *ni zuijin zenne-yang? 'You lately how-manner?':

(13) a. m-o m-ainenu na-[[os-ko emu'-a] ci vasavi]?
   AV-Rea AV-how Nom NAV.Rea-you grow-PV MM vasavi
   "How is the vasavi that you grow?"

   b. * i-si y-ainenu na-[[os-ko emu'-a]
      NAV.Rea-3S PV-how Nom NAV.Rea-you grow-PV
      ci vasavi]?
      MM vasavi

By contrast, the same construal is blocked in the passive construction (13b), presumably due to the intransitivity of resultative *how. Once again, the causal reading is missing here.

In sum, we find that a causal *how is not compatible with gerundive, head-internal, and ordinary complex NPs in Tsou. The causal reading seems to emerge only in presence of a bi-clausal structure where the apparent main predicate becomes a complement to *mainenu 'how', as we have seen in (7b).

2. *The Hows of Why*

The next step is to examine the theoretical status of Tsouic *why. First of all, it is worthwhile to note that the syntactic distribution of *mainenu 'how' and *mainci 'why' bears the hallmark of the *how-*why alternation in Chinese: As shown by the contrast between (14a,b), *mainenu 'how' can only get a method reading when c-commanded by the possibility modal *asou in *ho-constructions:

(14) m-i-ta *asou m-ainenu ho m-i-ta uh
   AV-Rea-3S can AV-how and AV-Rea-3S go
   ne-Tapangu 'e-Pasuya?
Loc-Tapang Nom-Pasuya

a. “By what means can Pasuya go to Tapang?”
b. # “How come Pasuya could go to Tapang?”

On the other hand, mainci 'why' must c-command the modal, as evidenced by the contrast between (15a,b):

(15) a. \textit{m-ainci m-i-ta ason\# uh ne-Tapang\# 'e-Pasuya?} \\
\textit{AV-why AV-Rea-3S can go Loc-Tapang Nom-Pasuya} \\
“Why did Pasuya go to Tapang?”

b. * \textit{m-i-ta ason\# m-ainci uh ne-Tapang\# 'e-Pasuya?} \\
\textit{AV-Rea-3S can AV-why go Loc-Tapang Nom-Pasuya}

This word order restriction is reminiscent of the structure-interpretation correlation displayed by Chinese \textit{how} and \textit{why} of (1) and (2).

By the same token, we also find that mainenu must follow adverbs of quantification such as conino 'always', and be interpreted as method rather than causal:

(16) \textit{m-i-ta conino m-ainenu ho m-im-o} \\
\textit{AV-Rea-3S always.AV AV-how and AV-drink-AV} \\
'\textit{e-Pasuya?} \\
Nom-Pasuya \\
a. “In what way does Pasuya always drink?”
b. # “How come Pasuya always drank?”

Mainci, on the other hand, takes the sentence-initial position, and cannot be scoped over by conino, as evidenced by the contrast between (17a,b):

(17) a. \textit{m-ainci m-i-ta conino m-im-o} \\
\textit{AV-why AV-Rea-3S always.AV AV-drink-AV} \\
'\textit{e-Pasuya?} \\
Nom-Pasuya \\
“Why does Pasuya always drink?”

b. * \textit{m-i-ta conino m-ainci m-im-o 'e-Pasuya?} \\
\textit{AV-Rea-3S always.AV AV-why AV-drink-AV Nom-Pasuya}
The same pattern emerges for their Chinese counterparts as well: When zenme 'how' follows zongshi 'always', we get a method reading, as in (18a); when zenme 'how' precedes zongshi, we get a causal reading, as in (18b):

(18) a. Akiu zongshi zenme hejiu?
   Akiu always how drink
   “In what way does Akiu always drink?”

   b. Akiu zenme zongshi hejiu?
   Akiu how always drink
   “How come Akiu always drank?”

The genuine why in Chinese, i.e., weishenme, always patterns with the pre-adverbial zenme of (18b), in that it can never be scoped over by zongshi:

(19) a. Akiu weishenme zongshi hejiu?
   Akiu why always drink
   “Why did Akiu always drink?”

   b. * Akiu zongshi weishenme hejiu?
   Akiu always why drink

Next we appeal to the “epistemic question” test mentioned in the introduction, teasing out epistemic why from other cognates, as shown by the contrast between (20a) on the one hand, and (20b,c) on the other hand:

(20) a. m-ainci m-o enghova 'e-engûca?
   AV-why AV-REA blue Nom-sky
   “Why is the sky blue?”

   b. m-o m-ainenu 'e-engûca ci enghova?
   AV-REA AV-how Nom-sky Comp blue
   “How was the sky such that it has become blue?”

   c. m-ainenu ci m-o enghova 'e-engûca?
   AV-how Comp AV-REA blue Nom-sky
   “How come the sky is blue?”
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In contrast to (20a), (20b) and (20c) assume a bi-clausal configuration: Here *ci* serves as a complementizer introducing the stative predicate *enghova* 'blue', and the causal reading duly arises. All these facts point to the conclusion that this dichotomy in question holds cross-linguistically despite the distinct morpho-syntactic makeups of Tsouic, Chinese, and English *wh*-expressions.

On the intuitive level, there seems to be a transition from the form “how is X such that X becomes Y” of (20b) to the form “how come X is Y” of (20c). It is thus reasonable to suggest that *mainci* historically derives from a contraction between *mainenu ci*, where *ci* is interpreted as *such that*, introducing the now familiar “change-of-state” flavor of causal *how*. The three-stage transition is illustrated as follows:

(21) a. *ci*-adjunction:

\[
\begin{align*}
&m-i-ta & m-ainenu & 'e-Pasuya & [ci & i-ta & eobak-a & 'e-Mo'o]?
\end{align*}
\]

AV-Rea-3S AV-how Nom-Pasuya Comp NAV.Rea-3S hit-PV Nom-Mo'o

“How was Pasuya, such that Mo'o was hit by him?”

b. *ci*-complementation:

\[
\begin{align*}
&m-i-ta & m-ainenu & [ci & eobak-o & to-Mo'o & 'e-Pasuya]?
\end{align*}
\]

AV-Rea-3S AV-how Comp hit-AV Obl-Mo'o Nom-Pasuya

“How come Pasuya hit Mo'o?”

c. *ci*-contraction (*mainenu + ci* → *mainci*):

\[
\begin{align*}
&m-i-ta & m-ainci & m-i-ta & eobak-o & to-Mo'o
\end{align*}
\]

AV-Rea-3S AV-why AV-Rea-3S hit-AV Obl-Mo'o Nom-Pasuya

“We why did Pasuya hit Mo'o?”

In (21a), *mainenu* and *ci* are separated by the matrix subject, with the latter introducing an adjunct clause. In (21b), they becomes adjacent, but still distinct from each other. Here *mainenu* acts as a matrix predicate, while *ci* introduces a complement clause. Finally in (21c), the contraction between *mainenu* and *ci* applies, and *mainci*
may have evolved into a genuine adverb. It is also worthwhile to note that the voice inflections remain coherent for the matrix and embedded clauses of (21b) and (21c), whereas the same requirement does not apply to (21a). Since a complement clause typically agrees with the root clause in voice in Tsou, this asymmetry further testifies to the adjunct-complement distinction between the ci-clauses of (21a,b), as well as the bi-clausal origin of mainci.\(^5\)

Furthermore, the only way to get a purposive question in Tsou is to employ a nominal predicate such as *cuma* 'what' of (22), where the subject is an relative internally headed by *kua* 'purpose':

(22) **cuma na-[kua te-ta uh ne-Tapangu ta-Pasuya]?**

\begin{tabular}{p{3cm} p{3cm} p{3cm} p{3cm} p{3cm}}
\hline
what & Nom & purpose & Irr-3S & go \text{ Loc-Tapang} & \text{ Nom-Pasuya} \\
\hline
\end{tabular}

“For what purpose will Pasuya go to Tapang?”

As a result, the literal translation of (22) is something like 'What is the purpose for which Pasuya will go to Tapang?'

For one thing, it may seem a bit strange to adopt the proposed analysis, as it is generally assumed that adjuncts do not head internal-head relatives. However, there are two reasons not to dismiss this possibility too quickly. On the one hand, we find similar construals in *how*-questions as well, as seen in (12a,b). The extensive usage of *kua* 'purpose' and *hia* 'way' in Tsou indicates that internal-head relatives headed by adjuncts are not as uncommon as previously thought. On the other hand, *kua* and *hia* may not be adjuncts at all in the traditional sense: They pattern with tense modals and verbs in their ability of taking an agreement, as evidenced by (23a,b):

(23) a. **m-i-ta m-ainenu na-[hia-ta eobak-o**

\begin{tabular}{p{3cm} p{3cm} p{3cm} p{3cm} p{3cm}}
\hline
AV-Rea-3S & AV-how & Nom & way-3S & hit-AV \\
\hline
\end{tabular} **ta-Mo'o 'e-Pasuya]?**

Obl-Mo'o Nom-Pasuya

“How is the way in which Pasuya hit Mo'o?”

b. **i-ta y-ainenu na-[hia-ta eobak-a**

\begin{tabular}{p{3cm} p{3cm} p{3cm} p{3cm} p{3cm}}
\hline
NAV-Rea-3S & PV-how & Nom & way-3S & hit-PV \\
\hline
\end{tabular} **ta-Mo'o 'e-Pasuya]?**

Obl-Mo'o Nom-Pasuya

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\(^5\) For a comprehensive survey of morphological connections between *how* and *why* in other Formosan languages, see Huang et al. (1996).
“How is the way in which Pasuya was hit by Mo'o?”

As the tense modal has been omitted, *hia* assumes its role of hosting the agreement suffix *-ta*, which always agrees with the agent, i.e., *Pasuya* in (23a) and *Mo'o* in (23b). As a working hypothesis, we may treat *kua* and *hia* as predicate nominals, which are by virtue indefinite, and hence subject to head-internal relativization.

3. *A Neo-Davidsonian Analysis*

In the long history of the philosophy of language, there have been quite a few breakthroughs made by implementing philosophical insights in linguistic analyses. One of them has to do with the postulation of an implicit event argument for predicates expressing activity in the vein of Davidson (1967). Take *Pasuya hit Mo'o* for instance. The sentence involves a hitting event, where *Pasuya* acts as the Agent and *Mo'o* the Theme. The intuition can be further sharpened along the line of Parsons (1990), as schematized below:6

\[ \exists e \ (\text{hitting}(e) \& \text{Agent}(e, \text{Pasuya}) \& \text{Theme}(e, \text{Mo'o})) \]

Parsons's proposal, often dubbed a “neo-Davidsonian” approach, treats the verb *hit* like a common noun predating upon an underlying event, which holds thematic relations to *Pasuya* and *Mo'o*, i.e., agenthood for the former and patienthood for the latter. Both the relations are represented as conjuncts of the hitting predicate, and the event argument is claimed to be existentially bound, as illustrated in (24). Consequently, *Pasuya hit Mo'o* would mean something like 'there was an event of hitting, and *Pasuya* is the Agent of the event, and *Mo'o* is the Theme of the event'.

Under this “conjunction” approach, VP-adverbials like *with a staff* can easily be accommodated by treating them as predicates of underlying events.7 Namely, *Pasuya hit Mo'o with a staff* can be understood as 'there was an event of hitting, and *Pasuya* is the Agent of the event, and *Mo'o* is the Theme of the event, and the event took place with a staff', as in (25):

6 We will leave out the tense elements throughout our discussion, which is translated into 'culmination in the past' under Parsons's approach. More specifically, the past tense is represented as a conjunct of the hitting predicate, and the semantics of 'Pasuya hit Mo'o' can be spelled out in the following way:

\[ \exists e \ [\text{hitting}(e) \& \text{Agent}(e, \text{Pasuya}) \& \text{Theme}(e, \text{Mo'o}) \& \exists t [t<\text{now} \& \text{Cul}(e,t)]] \]

7 There are a number of sentential adverbials which do not fall under the neo-Davidsonian analysis, including “speaker-oriented” and “subject-oriented” adverbs in the sense of Jackendoff (1972). We have nothing interesting to say here except that causal *how*, causal *why*, and epistemic *why* pattern with them with respect to their “operatorhood” and sentential scope. See Cinque (1999) for a comprehensive study of the syntax and semantics of this class of adverbials.
By the same token, *Pasuya hit Mo'o violently* may have a similar semantic representation when we take the manner adverbial *violently* to be a predicate of the hitting event:

(26) \( \exists e \text{ (hitting}(e) \& \text{Agent}(e, \text{Pasuya}) \& \text{Theme}(e, \text{Mo'o}) \& \text{violent}(e)) \)

The sentence is therefore understood as 'there was an event of hitting, and Pasuya is the Agent of the event, and Mo'o is the Theme of the event, and the event is violent'.

In light of this fine-grained semantics of adverbial modification, it is time to tackle the issue why conjunction and complementation should have so much bearing on the *how-why* alternation in Tsou. First consider (27) (7 repeated here):

(27) m-i-ta m-ainenu ho m-i-ta eobak-o
    AV-Rea-3S AV-how and AV-Rea-3S hit-AV
    ta-Mo'o 'e-Pasuya?
    Obl-Mo'o Nom-Pasuya
    a. “How did Pasuya hit Mo'o?”
    b. “How was it that Pasuya hit Mo'o?”

A typical conjunction construal is at work here for the method question (27a), and this is precisely where the neo-Davidsonian analysis really shines: *ho* keeps its categorial status as a conjunction, as in (28a):

(28) *ho*-conjunction \( \rightarrow \) method *how*
    a. Syntax:
        \[
        [\text{ConjP} [\text{IP} \text{m-i-ta m-ainenu}] [\text{Conj'} \text{ho} [\text{IP} \text{m-i-ta eobak-o ta-Mo'o} 'e-Pasuya]]]?
        \]
    b. Semantics:
        \(?x \exists e \text{ (hitting}(e) \& \text{Agent}(e, \text{Pasuya}) \& \text{Theme}(e, \text{Mo'o}) \& \text{Method}(e, x))\)

In terms of semantics, *mainenu* serves as a predicate of the implicit event argument, where the method of the hitting event is called into question, as in (28b). It is as though what should occur in semantics has been implemented a step earlier in syntax, which in turn lends cross-linguistic support to the underlying event hypothesis. Under
this approach, the mismatch between syntactic conjunction and semantic modification simply becomes irrelevant, and there is a straightforward mapping from syntax to semantics, i.e., from syntactic conjunction to semantic conjunction. We thereby provide an explicit account of how conjunction brings about the method reading.  

The treatment of the causal question (27b), on the other hand, needs more elaboration. One way to approach the problem is to say that ho may have evolved into a complementizer of some sort. The phenomena is not particular to Tsou. It is not uncommon for coordination to turn into subordination: As noted by Culicover & Jackendoff (1997) and references cited there, English and sometimes introduces a conditional in terms of semantics, while still functioning as a coordinating conjunction in syntax, as illustrated by the following examples: 9

(29) a. One more can of beer and I'm leaving. (≈ If you have one more can of beer, I'm leaving.)

b. Big Louis sees you with the loot and he puts out a contract on you. (≈ If Big Louis sees you with the loot, he'll put out a contract on you.)

Furthermore, we adopt the view that a causal question involves causation between two events (Tsai 1999c), namely, a cause event and a effect event in the sense of Vendler (1967). The two proposals combined give us the syntax and semantics of the causal question, as sketched below:

(30) ho-complementation → causal how
a. Syntax:
[IP m-i-ta m-aínenu [CP ho [IP m-i-ta eobak-o ta-Mo'oePasuya]]]?

8 One may wonder whether temporal and locative adverbials behave the same way in Tsou, since they can also be analyzed as predicates of underlying events. The answer is positive:

(i) m-o yon-to-hopo ho mongsi 'o-Pasuya.
AV-Rea at-Obl-room and cry.AV Nom-Pasuya
'Pasuya was crying in the room.'

(ii) m-i-cu yofna ho m-o suc'uhu to-emoo 'o-Pasuya.
AV-Rea-Perf evening and AV-Rea arrive.AV Obl-home Nom-Pasuya
'It has been evening when pasuya arrived home.'

In (i), the locative expression yon-to-hopo ‘at-Obl-room’ that serves as the conjunct of mongsi ‘cry’ in presence of the conjunction ho. In (ii), it is the temporal expression yofna ‘evening’ that is conjoined by ho to the seeming main predicate.

9 Mei (2003) points out that there was a similar construal in archaic Chinese, where syntactic coordination is a dominant features, and often leads to semantic subordination. Only after then came true causative and resultative constructions in ancient Chinese.
b. Semantics:

\( ?e \exists e' \{ \text{hitting}(e') \& \text{Agent}(e', \text{Pasuya}) \& \text{Theme}(e', \text{Mo'o}) \} \)

\( \text{CAUSE}(e, e') \)

Here the causation is represented as a two-place causative predicate, i.e., CAUSE. In the spirit of Hamblin (1973) and Karttunen (1977), we take the question operator (symbolized by \(?\)) to represent a combination of existential quantification and a speech act of soliciting information concerning the cause event (symbolized by \(e\)), whereas \(ho\) introduces a complement clause corresponding to the effect event (symbolized by \(e'\)). Furthermore, as noted by Bromberger (1992), the clausal complement of \emph{why} is typically factual, and hence presupposed. Namely, one cannot utter \emph{Why did Pasuya hit Mo'o?} without knowing 'Pasuya hit Mo'o' as a fact. Assuming the tripartite analysis of quantification, we put its content in the restriction of the existential quantifier that ranges over effect events.

Then how about the resultative and descriptive questions of (31) ((9) repeated here)?

**(31)**

\[
\begin{align*}
\text{m-i-ta} & \quad \text{m-ainenu} & \quad \text{ho} & \quad \text{m-i-ta} & \quad \text{peayofu} & \quad \text{’e-Pasuya}\? \\
\text{AV-Rea-3S} & \quad \text{AV-how} & \quad \text{and} & \quad \text{AV-Rea-3S} & \quad \text{run} & \quad \text{Nom-Pasuya}
\end{align*}
\]

\(a.\) “What is the result of Pasuya’s running?”

\(b.\) “What is the resultant state of Pasuya’s running?”

A tentative treatment of resultative \emph{how} is in order once we make the following proposal along the line of Culicover & Jackendoff (1997): \emph{ho} serves as a conjunction in syntax, while it has two functions in semantics (or in a conceptual structure in their terms). It may remain a conjunction, in which case \emph{mainenu} functions as a predicate of the underlying event, as suggested in our analysis of (28b), or it may act as a (semantic) complementizer such that \emph{mainenu} turns into an operator ranging over effect events. Consequently, (31a) differs from (27b) not in syntax, but in semantics:

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10 Originally conceived by Kamp (1981) and Heim (1982) to account for scope interactions, a tripartite structure partitions a quantificational sentence into three parts, i.e., a quantifier, its restriction, and the nuclear scope. Following Diesing (1992), we take what goes into the restriction as part of the presupposition of the sentence.

11 The proposed IP-conjunction analysis also has an edge in explaining two facts: a) there is usually one set of the voice-modal-clitic complex for each conjunct; b) it is not unusual for the subject to appear with \emph{mainenu} in the left conjunct, as evidenced by the following mini-pair of (31):

**(i)**

\[
\begin{align*}
\{\text{Conf}\}\{\text{m-i-ta} & \quad \text{m-ainenu} & \quad \text{’e-Pasuya}\} & \quad \{\text{Conf}\}\{\text{ho} & \quad \text{m-i-ta} & \quad \text{peayofu}\}\}
\end{align*}
\]

\(\text{AV-Rea-3S} \quad \text{AV-how} \quad \text{Nom-Pasuya} \quad \text{and} \quad \text{AV-Rea-3S} \quad \text{run}
\]

\(a.\) “What is the result of Pasuya’s running?”

\(b.\) “How is the resultant state of Pasuya’s running?”
ho “complementizes” the left conjunct instead of the right conjunct, as in (32b), where it is the effect event (symbolized by e’) rather than the cause event (symbolized by e) that is being questioned, as in (32b):

(32) ho-complementation → resultative how
a. Syntax:
   \[ [\text{ConjP} [\text{IP} \text{m-i-ta m-ainenu}] [\text{Conj'} \text{ho} [\text{IP} \text{m-i-ta peayofu 'e-Pasuya}]])\]
b. Semantics:
   \[ ?e' \exists e (\text{CAUSE}(e, e') \& \text{running}(e) \& \text{Agent}(e, \text{Pasuya}) \]

Hence the resultative reading of (31a). As for the descriptive construal of (31b), the syntax remains very much the same, while the semantics is slightly different: Here mainenu is regarded as a predicate of the resultant state (symbolized by s), which in turn is put into question, as schematized in (33b):

(33) ho-complementation → descriptive how
a. Syntax:
   \[ [\text{ConjP} [\text{IP} \text{m-i-ta m-ainenu}] [\text{Conj'} \text{ho} [\text{IP} \text{m-i-ta peayofu 'e-Pasuya}]])\]
b. Semantics:
   \[ ?s' \exists e (\text{CAUSE}(e, s) \& \text{running}(e) \& \text{Agent}(e, \text{Pasuya}) \]

By comparison, causal why also involves causation between two eventuality arguments in Tsou. First consider (34) ((20c) repeated here):

(34) m-ainenu ci m-o enghova 'e-enguca?
   AV-how Comp AV-Rea blue Nom-sky
   'How come the sky is blue?'

(35a) illustrates our view that ci serves as a complementizer heading a clausal complement to its right:

(35) ci-complementation → causal why
a. Syntax:
   mainenu [CP ci [IP m-o enghova 'e-enguca]]?
b. Semantics:
   \[ ?e \exists e' [\text{BECOME}(\text{blue})(e') \& \text{Theme}(e', \text{sky})] (\text{CAUSE}(e, e')) \]
In terms of semantics, the effect of the causation is a change-of-state, i.e., the becoming of blue, while the speaker want to know the cause, as in (35b). This move explains why ci-complementation patterns with ho-complementation in licensing the causal questions.

Epistemic why, it seems, differs from causal why crucially in referring to a resultant state, e.g., a state of being blue in (36) ((20a) repeated here):

(36) m-ainci m-o enghova 'e-engüca?
    AV-why AV-Rea blue Nom-sky
“Why is the sky blue?”

The intuition is formulated in (37b):

(37) ci-contraction → epistemic why
    a. Syntax:
       \[ CP \text{ mainci} [IP \text{ m-o enghova 'e-engüca}] \]
    b. Semantics:
       ?>e \exists s [blue(s) & Theme(s, sky)] (CAUSE(e, s))

In terms of syntax, ci-contraction may prove to have a much more dramatic effect on the categorial status of mainenu 'how' than on its phonological content. It is not unlikely that mainci 'why' has evolved into a genuine adverb under grammaticalization, occupying the Spec of CP, as illustrated in (37a). There is actually a very good reason to believe that this move is on the right track: As indicated by the contrast between (38) and (39), a causal question, but not a method question, is sensitive to Complex-NP islands in Tsou:

(38) m-i-ko m-ici bon-# no-[[m-ainenu ho
    AV-Rea-you AV-like eat-AV Obl AV-how and
    te pe’i] ci cai]?
    Irr cook MM vegetable
   “What is the method x such that you like to eat [the vegetable
   one will cook with x]?”

(39)*m-i-ko m-ici bon-# no-[[m-ainci
    AV-Rea-you AV-like eat-AV Obl AV-why
    te pe’i] ci cai]?
    Irr cook MM vegetable
   “What is the reason x such that you like to eat [the vegetable
One cooks for x]?”

Mainenu, therefore, patterns with a nominal argument such as sia 'who' of (40), in employing the unselective binding strategy to elude island effects.12

(40) mafe 'o-[i-si enw'a no sia] ci f'ue]?
delicious Nom NAV. Rea-3S grow Obl who MM yam

“Who is the person x such that [the yams [which was grown by x]] are delicious?”

The same rescue, however, is not available for mainci in (39), in that it is not nominal, and cannot introduce a variable in situ. Rather, mainci should be classified as a full-fledged adverb, functioning as a sentential operator rather than a predicate of an underlying event. In our view, this is exactly the reason causal how, causal why, and epistemic why all tend to take a clausal complement in Syntax, and a sentential scope in LF across languages (see Rizzi 1990, Collins 1991, Tsai 1994, Epstein 1998, among many others).

4. Agentivity Restriction

Finally, we turn to a curiosity of method how: In the Chinese sentence (41a), premodal how is interpreted as causal, just as expected from our discussion of (1a,b):

(41) a. Akiu zenme hui shengbing?
   Akiu how would sick
   “Why would Akiu be sick?”

b. * Akiu hui zenme shengbing?
   Akiu would how sick

12 As noted by Tsai (2003), the long-distance wh-dependencies in Tsou presents an interesting comparison with those in Palauan, Chamorro, and Selayarese, which have been under extensive investigation in Georgopoulos (1991), Chung (1994), and Finer (1997). These languages employ the resumptive pronoun strategy à la Cinque (1990). As illustrated in (ia), it merges a wh-phrase and an in-situ pro into a operator position and a variable position respectively, and no movement is involved in establishing the binding relation:

(i) a. whx ... [island ... pro(x) ... ]
   b. Qt ... [island ... f(wh) ... ]

In a sense, what we found in Tsou presents a mirror image of those in Palauan, Chamorro, and Selayarese: Tsou adopts the unselective binding strategy (cf. Heim 1982, Pesetsky 1987, Nishigauchi 1990, Reinhart 1997, 1998, Tsai 1999a,b). It merges an implicit question operator to a scope position, thereby licensing a (choice function) variable associated with the wh-in-situ, as schematized in (ib). A choice function picks out an individual member of a non-empty set without leaving an N-restriction in-situ, which may lead to various interpretive problems (cf. Reinhart 1997, 1998).
“How would Akiu be sick?”

On the other hand, postmodal how should get a method reading in (41b), but the sentence turns out to be ungrammatical. In other words, statives do not get along with method how. This restriction is not limited to statives: As a matter of fact, unaccusatives and experiencer-subject psych-verbs block method questions as well, as exemplified by si 'die' in (42) and pa 'fear' in (43) respectively:

(42) Akiu  zenme  si  le?
    Akiu  how  die Inc
    a. “How come Akiu died?”
    b. # “By what method did Akiu died?”

(43) Akiu  zenme  pa  Xiaodi?
    Akiu  would  fear Xiaodi
    a. “How come Akiu fears Xiaodi?”
    b. # “By what method does Akiu fear Xiaodi?”

which in turn leads to the conclusion that method how requires an agentive subject (Tsai 1999c).

When we test this theory on Tsouic how, the result is very encouraging indeed. As illustrated by the ho-construction (44), the method reading is missing with the stative predicate tmacongo 'sick':

(44) m-o  m-ainenu  ho  m-o  tmacongo  'o-Pasuya?
    AV-Rea  AV-how and AV-Rea  sick  Nom-Pasuya
    a. “How is it that Pasuya was sick?”
    b. # “How was Pasuya sick?”

This presents a sharp contrast to (45) ((27) repeated here), which contains an activity verb, and keeps both the method and causal readings:

(45) m-i-ta  m-ainenu  ho  m-i-ta  eobak-o
    AV-Rea-3S  AV-how and AV-Rea-3S  hit-AV
    ta-Mo'o  'e-Pasuya?
    Obl-Mo'o Nom-Pasuya
    a. “How did Pasuya hit Mo'o?”
b. “How was it that Pasuya hit Mo'o?”

Applying the test on ci-constructions produces similar results, as evidenced by (46) and (47):

(46) m-o m-ainenu ci m-o tmacongo 'o-Pasuya?
   AV-Rea AV-how Comp AV-Rea sick Nom-Pasuya
   a. “How come Pasuya got sick?”
   b. # “How was Pasuya sick?”

(47) m-o m-ainenu 'o-Pasuya ci m-o tmacongo?
   AV-Rea AV-how Nom-Pasuya Comp AV-Rea sick
   a. “How come Pasuya got sick?”
   b. # “How was Pasuya sick?”

Next consider unaccusative verbs like mcoi 'die', where no Agent role is involved. As it turns out, when the realis modal mo is absent in the right conjunct of ho-constructions, a causal reading is preferred, as in (48a):

(48) a. m-o m-ainenu ho mcoi 'e-Mo'o?
   AV-Rea AV-how and die Nom-Mo'o
   “How is it that Mo'o died?”

b. m-o m-ainenu ho m-o mcoi 'e-Mo'o?
   AV-Rea AV-how and AV-Rea die Nom-Mo'o
   “How is the resultant state of Mo'o's dying?”

By contrast, when the realis modal appears in the right conjunct, as in (48b), the reading tends to be descriptive.13 In both cases, method questions are blocked.

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13 Note that the contrast between (46a,b) provides a useful clue for drawing a structural distinction between causal and resultative questions: The realis modal mo is not required in the right conjunct of (ia) because the tense of Mo'o dying is dependent on the matrix clause:

(i) a. m-o m-ainenu [CP ho [IP mcoi 'e-Mo'o]]?
   AV-Rea AV-how and die Nom-Mo'o
   “How is it that Mo'o died?”

b. [ConjP m-o m-ainenu [Conj' ho [IP m-o mcoi 'e-Mo'o]]]? 
   AV-Rea AV-how and AV-Rea die Nom-Mo'o
   “How is the resultant status of Mo'o's dying?”

On the other hand, mo must appear in the right conjunct of (ib) because the tense of Mo'o's dying do not depend on the result clause (i.e., the left conjunct). The phenomenon thus provides substantial support to our conjunction-complementation analyses presented throughout (28-33).
Moreover, *how*-questions built with the gerundive strategy also display the same trait, as evidenced by the contrast between (49a,b) and (49c):

\[(49)\]  
\[m-o \ \{\text{mainenu} \ na-[\text{DP} \ hia \ tmacongo \ to-Pasuya]\}? \]

- a. “What was the manner/degree of Pasuya's sickness?”
- b. “What was the medium of Pasuya's getting sick?”
- c. # “How was Pasuya's method of getting sick?”

Namely, when the gerund is headed by the stative predicate *tmacongo* 'sick', the method reading is ruled out.

All in all, it seems safe to say that Tsou patterns with Chinese in not allowing a method question when the subject is not agentive. On the other hand, there is a clear-cut structural asymmetry between the two languages: In Chinese, *zenme* 'how' serves as a VP-modifier, i.e., a modifier of an activity, as illustrated below:

\[(50)\]  
Chinese method *how*

```
  ... Mod'  
     Mod  VP  
   zenme  VP ≈ activity
```

By contrast, *mainenu* 'how' heads a IP-conjunct in Tsou, i.e., a conjunct of an event:

\[(51)\]  
Tsouic method *how*

```
  ConjP  
   IP  Conj'  
   ... mainenu ... ho IP ≈ event
```

Therefore, there seems to be no coherent way to relate *how* to its subject by a syntactic means. The dilemma suggests that the agentivity restriction is indeed a semantic one: In both Chinese and Tsou, *how* and anAgent may interact indirectly through their relations to the underlying event, as illustrated in following schema:
Two types of \textit{wh}-adverbials

\begin{equation}
\exists e \ (\text{predicate}(e) \land \text{Agent}(e, \text{individual}) \land \text{Method}(e, x))
\end{equation}

This way, the restriction can easily be derived by saying that method \textit{how} picks out eventualities only of the activity type, which naturally require an Agent to be their subject. Given the neo-Davidsonian adjunct association of (52), we are able to provide a unified account without further complications in terms of the distinct syntax of \textit{zenme} and \textit{mainenu}.

5. \textbf{Concluding Remarks}

All in all, we find it quite rewarding to sort out various factors bearing on \textit{how-why} alternations across languages from a vantage point of the syntax-semantics interface. In terms of syntax, there seems to be a cross-linguistic generalization that causal \textit{how}, causal \textit{why}, and epistemic \textit{why} occupy a position with a sentential scope, and take the rest of the sentence as their complement. In terms of semantics, there is always a cause-effect relation underpinning their syntactic distributions. We capture the generalization by positing a causative predicate taking two events as its arguments, i.e., \text{CAUSE} (e, e'), where \textit{e} stands for a cause event, and \textit{e'} an effect event. In a causal question, it is the cause event that is bound by the question operator; in a resultative question, the effect event is bound instead.

Furthermore, the conjunction and complementation strategies associated with \textit{ho} give good indication of how the labor is divided between syntax and semantics, with a view to forming \textit{how}-questions with causal, method, and resultative construals, and in particular, solving the dilemma caused by the agentivity restriction on method \textit{how} in a principled way. The fact that VP-adverbials are construed as conjuncts in Tsou therefore not only provides syntactic evidence for adjunct association in the neo-Davidsonian style, but also argues for an independent semantic component (or a conceptual component to a similar effect) in the modules of grammar.
References

Bromberger, Sylvain 1992. *On What We Know We Don't Know*. Chicago University Press & Center for Study of Language and Information, Stanford.


