On Embedding Force and Attitude:
Evidence from Chinese and Vietnamese non-canonical *wh*-expressions

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11.1. Setting the stage

Syntactic constructions encoding illocutionary forces and speaker's attitudes are often taken to be associated with the so-called main clause phenomena (cf. Haegeman 2012, 2014; Aelbrecht, Haegeman & Nye 2012). As illustrated by the causal *how*-question (1a), there is a strong flavor of disapproval/unexpectedness, and the instrumental reading is suppressed by the exclamatory intonation (cf. Rett & Sturman 2021). By contrast, (1b,c) shows that, once the *how*-question is embedded, the disapproval reading is suppressed instead, and the interpretation is distinctively instrumental:[1]

(1) a.   How could you do this to him?!   (disapproval, #instrumental)

     b.   I wonder how you could do this to him.   (#disapproval, instrumental)

     c.   Regardless of how you could do this to him,   (#disapproval, instrumental)
          I'm willing to forgive you.

However, there are quite a few exceptions. As pointed out by Krifka (2014), an illocutionary act may be embedded as the argument of a force operator such as a verb of saying or a speech act adverbial. Interestingly enough, in a robust analytic language like Chinese, which lacks *wh*-movement and subject-AUX inversion, there is a more pronounced "topography" of functional elements along the clausal spine in the left periphery, which can be used to distinguish various layers of syntactic projections in relation to their semantics and pragmatics (cf. Cinque 1999; Cinque & Rizzi 2010; Tsai 2008, 2015a,b). The "height of interpretation" can then be established to account for the distribution of certain subordinate clauses in terms of truncation (cf. Haegeman 2012), as imposed by all sorts of compositional factors such as selection, predication and modification.

In this chapter, we examine a peculiar case of force/attitude embedding, i.e., the non-canonical *wh*-construals in Chinese and Vietnamese, and offer a plausible account along the line laid out above. Section 2 lays out the syntax, semantics and pragmatics of three variants of *zenme* 'how' along the clausal spine. They can be embedded under predicates with matching selectional properties. Section 3 starts with a brief introduction of the non-interrogative usage of applicative *shenme* 'what' in Mandarin (i.e. the so-called whining question). We show that its embeddability essentially patterns with the three types of *how*-construals in Mandarin, in that the choice of main predicates does matter in restricting the non-canonical *wh*-construals typically observed in root clauses. Section 4 and Section 5 extend our analysis to Taiwan Southern Min and Vietnamese respectively with largely positive results. Section 6 concludes this chapter.

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[1] As noted by Richard Kayne and James Huang (p.c.), some speakers of English do get a mirative interpretation with (1b). This construal can be attributed to another verb meaning of *wonder* 'to feel or express surprise', which may well license a mirative complement. See the discussion of Chinese mirative *how* in Section 11.2.

11.2. Three types of *how*-construals

As noted in Tsai (2008) and Stepanov & Tsai (2008), a variety of *zenme* 'how' in Mandarin can be teased apart with structural delimiters like modals and topics, as illustrated by the disapproval/denial exclamation (high HOW, henceforth HHOW) of (2a) and (3a), the causal-mirative construal (mid HOW, henceforth MHOW) of (2b) and (3b), and the instrumental question (low HOW, henceforth LHOW) of (2c) and (3c):[2]

(2) a. **zenme** Akiu   hui zuo zhe-zhong   shi!   (HHOW, disapproval)
       how   Akiu   will do this-sort   thing
       'How would Akiu do such a thing!'
       (≈ It should be impossible for Akiu to do such a thing!)

    b. Akiu   **zenme** hui zuo zhe-zhong   shi?!   (MHOW, causal-mirative)
       Akiu   how   will do this-sort   thing
       'How come Akiu would do such a thing?!'

    c. Akiu   hui **zenme** zuo zhe-jian shi?!   (LHOW, instrumental)
       Akiu   will how   do this-Cl   thing
       'By what means will Akiu handle this matter?'

(3) a. **zenme**   xuesheng neng zhuan zhemeduo   qian!
       student how   can earn   such.amount   money
       'How could a student earn such amount of money!'
       (≈ It should be impossible for a student to earn such amount of money!)

    b. xuesheng **zenme** neng zhuan zhemeduo   qian?!
       student   how   can earn   such.amount   money
       'How come a student could earn such amount of money?!'

    c. xuesheng neng **zenme** zhuan   zhemeduo   qian?
       student can   how   earn   such.amount   money
       'By what means can a student earn such amount of money?'

We may take this three-way distinction as a starting point, and put various *how*-construals under the embedding test: The contrast between (4a) and (4b,c), as well as that between (5a) and (5b,c), indicates that only a question clause can be selected by a matrix predicate such as

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[2] For a detailed discussion of the disapproval and mirative usages of *zenme* 'how' in Mandarin, see Tsai & Yang (to appear). For extensive investigation of non-canonical *wh*-construals of this sort in terms of semantics and pragmatics, see Trotzke & Czypionka (in press) and Tovena (this volume).

xiangzhidao 'wonder',[3] where HHOW and mirative MHOW are consistently blocked.[4]

(4) a. * ta xiangzhidao [**zenme** Akiu hui zuo zhe-zhong shi].
         he wonder   how   Akiu   will do   this-sort   thing
         'He wonders about [(the inexpectancy) that Akiu would do such a thing].'
         (*HHOW)

    b.   ta xiangzhidao [Akiu **zenme** hui zuo zhe-zhong shi].
         he wonder   Akiu how   will do   this-sort   thing
         'He wonders [how come Akiu would do such a thing].'
         (causal/*mirative MHOW)

    c.   ta xiangzhidao [Akiu hui **zenme** zuo zhe-zhong shi].
         he wonder   Akiu will   how   do   this-sort   thing
         'He wonders [by what means Akiu would do such a thing].'
         (LHOW)

(5) a. * ta xiangzhidao [**zenme** xuesheng neng zhuan zhemeduo qian].
         he wonder   how   student can   earn   such.amount   money
         'He wonders about [(the inexpectancy) that a student could earn such
         amount of money].'
         (*HHOW)

    b.   ta xiangzhidao [xuesheng **zenme** neng zhuan zhemeduo qian].
         he wonder   student   how   can   earn   such.amount   money
         'He wonders [how come a student could earn such amount of money].'
         (causal/*mirative MHOW)

    c.   ta xiangzhidao [xuesheng neng **zenme** zhuan   zhemeduo   qian].
         he wonder   student   can how   earn   such.amount   money
         'He wonders [by what means a student can earn such amount of money].'
         (LHOW)

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[3] It should be noted here that, when a second-person pronoun is substituted for the embedded subject in (4b,c) and (5b,c), the complement is often taken to be a root question. Take (i) for example:
(i)   Akiu   xiangzhidao   [ni   hui   zenme   qu   taibei]?
        Akiu   wonder   you will how   go   Taipei
        'Akiu wonder: how will you go to Taipei?'
We may call this a masked direct question, which may well involve a direct discourse construal licensed by a speaker-oriented PRO situated in the Speech Act Phrase (SAP) of the question complement. Roger Liao (p.c.) points out further that a similar construal may even allow a sentence-final particle (SFP) *ma* in the question complement, which is unexpected in typical complementation:
(ii)   Akiu   xiangzhidao   [ni   chi   fan   le   ma]?
        Akiu   wonder   you eat   meal Inc   Q$_{\text{yes-no}}$
        'Akiu wonder: have you eaten any meal?'

[4] As noted by Carla Umbach (p.c.), the mirative reading is not universally blocked in a question complement, as seen in the follow German example: *wie* 'how' can be construed either as causal (as in *wie es komm*t 'how it comes'), or as mirative (as in *wie es sein kann* 'how it is possible'):
(i)   Er wundert sich, wie (es kommt)/wie (es sein kann), dass ein Student soviel Geld verdient.
        'He wonders how (it comes)/how (it is possible) that a student earns that much money'
Here an educated guess comes to mind: it may well be the case that *wundert* 'wonder' patterns with its English counterpart in allowing an alternative interpretation as 'to feel or express surprise' (see footnote 1). By contrast, Mandarin *xiangzhidao* literally means 'want to know', and does not license a mirative complement as a result.

The same point can be made with an adverbial clause headed by *wulun* 'no matter', as illustrated by the contrast between (6a) and (6b,c), as well as that between (7a) and (7b,c). It is also instructive to note that once again the mirative flavor is absent from the MHOW of (6b) and (7b) in this subordinate context:

(6) a. * wulun   [**zenme**   Akiu hui zuo zhe-zhong shi],
         no.matter how   Akiu will do   this-sort   thing
         na   dou yu   wo wuguan.
         that all   with me no.relation.
         '*No matter [how Akiu would do such a thing!], that has nothing to do with me.'[5]
         (*HHOW)

    b.   wulun   [Akiu   **zenme**   hui zuo zhe-zhong shi], ...
          no.matter Akiu   how   will do   this-sort   thing
          'No matter [how Akiu would do such a thing], that has nothing to do with me.'
          (causal/*mirative MHOW)

    c.   wulun   [Akiu   hui **zenme**   zuo zhe-jian shi], ...
          no.matter Akiu   will how   do   this-Cl   thing
          'No matter [by what means Akiu will handle this matter], that has nothing to
          do with me.'
          (LHOW)

(7) a. * wulun   [**zenme** xuesheng neng zhuan   zhemeduo   qian],
         no.matter how   student   can   earn   such.amount   money
         na   dou yu   wo wuguan.
         that all   with me no.relation.
         '*No matter [how a student could earn such amount of money!], that has
         nothing to do with me.'
         (*HHOW)

    b.   wulun   [xuesheng   **zenme**   neng zhuan   zhemeduo   qian], ...
          no.matter student   how   can   earn   such.amount   money
          'No matter [how a student could earn such amount of money], that has
          nothing to do with me.'
          (causal/*mirative MHOW)

    c.   wulun   [xuesheng   neng **zenme** zhuan   zhemeduo   qian], ...
          no.matter student   can   how   earn   such.amount   money
          'No matter [by what means a student could earn such amount of money],
          that has nothing to do with me.'
          (LHOW)

More importantly, once we embed these *how*-clauses as the complement of *jingya* 'surprised', LHOW is blocked instead, as in (8a). HHOW, on the other hand, is preserved in the form of an unexpected state of affairs (i.e., a surprise), as in (8b):[6]

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[5] The exclamation mark "!" in the English translation marks the exclamatory intonation associated with the embedded question clause, which is incompatible with its complementizer *no matter*.

[6] The fact that (8a) is ruled out in Mandarin may be surprising to some, as it is well-documented in the literature

(8) a. * ta   hen jingya   [xuesheng neng **zenme** zhuan   zhemeduo qian].
         he   very surprised student   can how   earn   such.amount money
         'He is surprised at [(the way) how a student can earn such amount of money!].'
         (*LHOW)

    b.   ta   hen jingya   [**zenme**   xuesheng neng zhuan   zhemeduo qian].
         he   very surprised how   student   can earn   such.amount money
         'He is surprised at [(the inexpectancy) that a student could earn such
         amount of money].'   (HHOW)

The most interesting case comes from MHOW, which is interpreted as mirative rather than causal, which is the exact opposite of what we have seen in the (b)-clauses of (4-7): As shown by (9), it is the causal question that is suppressed in favor of the mirative construal:

(9) ta   hen jingya   [xuesheng **zenme**   neng zhuan   zhemeduo qian].
    he   very surprised student   how   can earn   such.amount money
    'He is surprised at [(the inexpectancy) that a student can earn such amount of money].'
    (mirative/*causal MHOW)

The result is not surprising if we adopt the following three-way distinction among *wh*-expressions from Trotzke & Czypionka's (in press) experimental studies:[7]

(10) a.   information-seeking questions: can be answered, but not affirmed
     b.   exclamatives: can only be affirmed but not answered
     c.   surprise-disapproval questions: can be either answered or affirmed

Namely, LHOW is a typical information-seeking question of manner/instrument, modifying the *v*P domain, whereas HHOW is an exclamative endowed with an illocutionary force, i.e., disapproval/denial, scoping over the entire clause. MHOW, on the other hand, stands somewhere in-between, which can be either a causal question or a mirative expression.[8] In the vein of Rizzi (1997, 2001), one may well approach the issue syntactically by proposing that there is a hierarchical arrangement of various versions of *zenme* 'how' along the clausal spine, as sketched below (Q: question operator; M: modal):[9]

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that *surprise* has no problem of taking a question complement (see, for instance, Romero 2015). The issue, in my view, is related to the proposal that *be surprised at* actually takes an "implicitly nominalized" complement, whose semantics is more like 'the answer to the question how ...' or 'the way how ...'. It is thus likely that this option is not available to *jingya* in Chinese in that it takes a clausal complement rather than a nominal complement.

[7] See also Pan (2015) for a comprehensive survey of all sorts of peripheral *wh*-construals in Chinese.

[8] See Lahiri (1991) and Romero (2015) for an interesting discussion of the selectional properties of *surprise*-type predicates: Only *wh*-questions, but not with alternative/polar questions, can be embedded under them. Since we only concern ourselves with non-interrogative *wh*-construals in this chapter, we will pursue the issue elsewhere.

[9] Lukasz Jedrzejowski (p.c.) raises an interesting issue as to whether the three different types of *zenme* may co-occur in the same clause. Unfortunately, this possibility is ruled out for various reasons:
a) Haplology is strictly observed in Mandarin Chinese.
b) There would be a conflict between disapproval *zenme* and causal *zenme* in terms of illocutionary force.
c) *Wh*-adverbs (e.g., causal/mirative *zenme*) and *wh*-nominals (e.g., instrumental *zenme(yang)*) are not subject to "scope absorption" and form a multiple *wh*-question (cf. Higginbotham & May 1981; Chomsky 1986), as evidenced by the following example:
(i) * Akiu **zenme**   keyi **zenme(yang)**   zuo zhe-zhong shi?
      Akiu how   can how(manner)   do   this-kind   thing
      '*How come Akiu can do such thing how?"

[ForceP HHOW … [TopP Top … [EvaP MHOW … [IntP MHOW … [EpiP M … [FinP … [vP LHOW …

This hierarchical arrangement can be spelled out further as follows:

I.   HHOW is situated in the Spec of ForceP, encoding the disapproval/denial force.

II.   MHOW occupies the area in between MHOW and LHOW, with mirative *zenme* merged to EvaP, expressing surprise, and causal *zenme* to IntP, expressing causality (cf. Tsai 2019).[10] Both *wh*-expressions scope over the event denoted by the FinP.

III. LHOW merges to the edge of the *v*P phase, forming an instrumental question with the question operator Q in the Spec of IntP through unselective binding (cf. Tsai 1994, 1999).

By employing the notion of selection in the sense of Rizzi (2016), we may well take *xiangzhidao* 'wonder' and *wulun* 'no matter' to select an IntP rather than a ForceP, hence blocking the disapproval construals of HHOW in the (a)-clauses of (4-7) (see also Saito 2010 and Yoshida 2019 for a semantic selection account of Japanese complementizers). In the case of *jingya* 'surprised', the matrix predicate selects an EvaP. As a result, it suppresses the instrumental construal of LHOW in (8), as well as the causal reading of MHOW in (10).

Now the question boils down to why it is still possible for *jingya* 'surprised' to accommodate HHOW, which requires a ForceP as its host? Two things come to mind: One way to think of it is to return to Krifka's position by proposing that *jingya* may express surprise by exclaiming the disapproval. Consequently, it selects either a ForceP associated with the disapproval act or an AttP of surprise, which may well contain a mirative component within. Another possibility is that the clause-initial *zenme* of (9) is actually a displaced MHOW that encodes mirativity rather than a disapproval. We will leave the issue open here to future research.[11]

The reason behind this phenomenon, as provided by Reinhard (1998) and Tsai (1999), is that only *wh*-nominals are subject to unselective binding by a Q-operator high up in the left periphery. This account is further supported by the fact that, when Q-operator binding is not involved, causal/mirative *zenme* is compatible with an instrumental/manner/degree expression merged low in the *v*P periphery:

(ii)   ni   zenme   keyi   zheme   zuo   shi?!
       you   how   can   this.way do   thing
       'How can you do things this way?!'

(iii) ni   zenme   keyi   zheme   jianghua?!
       you   how   can   this.way speak
       'How can you speak in such manner?!'

(iv)   ni   zenme   keyi   zheme   pingjing?!
       you   how   can   this.degree calm
       'How can you be so calm?!'

[10] A causal question in Chinese is therefore an operator-in-situ question with *zenme* 'how' merged directly to the left periphery. More specifically, the locus of causal *how* may well be the Spec of CauP (cf. Tsai 2015b: 7), in parallel to reason *why* in the Spec of ReasonP (cf. Shlonsky & Soare 2011: 656).

[11] It should also be noted here that Badan & Cheng (2015) points out that Mandarin exclamative clauses can be embedded under a factive verb like *zhidao* 'know', as exemplified by (i):

(i)   ta   zhidao   Lisi   zenme   zheme   gao   a!
       S/he   know   Lisi   how   so   tall   SFP
       'S/he knows how very tall Lisi is!'

To our ear, this sentence is allowed only if the sentence-final particle (SFP) *a* belongs to the main clause, not to the factive complement, in which case the embedded constituent is a question rather than an exclamation. A similar pattern can be found in Vietnamese (Tran Phan p.c.):

11.3. The mystery of whining *what*

One piece of evidence for our line of thinking can be found in the so-called whining *what*-question such as (11a). As noted by Tsai (2011, 2021), this construal essentially involves a FOR applicative in disguise with an overriding whining force and exclamatory intonation, as illustrated in (11b).

(11) a.   ni   ku   shenme?!
        you cry what
        'What the hell are you crying for?!'   (whining)

b.
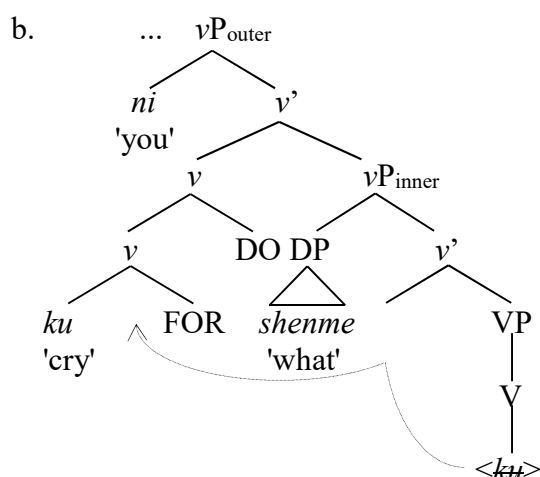
But where does the whining force come from? How is it encoded in Mandarin? As demonstrated by the experimental study of Yang & Tsai (2019), the "force shift" from interrogative to whining has a close bearing on the following two factors:

I.   the change of the overall prosodic pattern (i.e., the distinctive intonation associated with clause-typing)

II.   the stress shift from the object *wh*-expression (i.e., the locus of nuclear stress) to the inner light verb FOR (i.e., the locus of emphatic focus)

Since the inner light verb is phonological null, it needs something to carry the prosodic weight assigned to it. This in turn triggers the V-to-FOR raising in (11b). Verb copying with similar

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(ii) a.   Tí   sao cao thế này!
            Ti   how tall like.this
            'How tall Ti is!'
      b. *Tí   biết [nó sao cao thế này!]
            Ti   know he how tall like.this
            '*Ti knows [how tall he is!]'
    Nonetheless, when the matrix predicate is replaced by *jingya* 'surprised', the exclamative reading becomes available for the complement in question, where the SFP is marginally allowed, as in (ii):
(iii) ta   hen jingya   [Lisi zenme   zheme   gao (ˀa)].
      S/he very surprised Lisi how   so   tall SFP
      'S/he knows how very tall Lisi is!'
This suggests that the choice of predicates does matter in accommodating ForceP.

focus effects is also attested in Gungbe (Aboh 2004) and the Kwa languages (Landau 2007).

Armed with the above knowledge, we may proceed to comparing a typical *wh*-question like (12a) with its whining counterpart (12b) in experimental terms:

(12) a.   ni   kan   shenme?   [interrogative *wh*]
       you look.at   what
       'What are you looking at?'

     b.   ni   kan   shenme?!   [whining *wh*]
       you look.at   what
       'What the heck are you looking at (me) for?!'

As reported by Yang & Tsai (2019), all the measurements point to the fact that the two construals are very different with respect to their intonations and prosodic prominance, as illustrated by Figure 11.1:

<insert Figure 11.1 here>).

Figure 11.1. Mean F0 curves of interrogative *wh* (solid line) vs. whining *wh* (dotted line)

Moreover, the duration and intensity indicates that the focus/stress placement for the whining *wh*-construal of (12b) is clearly on the verb *kan* 'look.at' rather than the object *shenme* 'what' (see also Tsai 2021).

In terms of syntax, there is also a crucial difference between whining *wh* and its interrogative counterpart: The former may employ verb copying, as in (13a), and the latter cannot, as in (13b).

(13) a.   ni   [$_v$ **kan**]   shenme   [$_V$ kan]?!   [verb copying of whining *wh*]
       you look.at   what   look.at
       'What the heck are you looking at (me) for?!'

     b. * ni   kan   shenme   kan?   [*verb copying of interrogative *wh*]
       you look.at   what   look.at
       'What are you looking at?'

Interesting enough, the above experimental study shows that the first verb copy of *kan* 'look.at' are more prominent that the second verb copy in prosodic terms. Based on the copy theory of Chomsky (1995), we take the verb copying in question to be an instance of V-to-*v* movement, which process is similar to the one depicted in (11b) except that the lower copy of the verb chain is spelled out at PF. This treatment is in very much the same spirit as Cheng's (2007) analysis of typical verb copying constructions in Mandarin. For one thing, spelling out both copies violates the LCA (Kayne 1994). According to Cheng, verb copying applies at failure to reduce a verb chain, as its lower copy has been fused with an aspect marker. In our case, raising to FOR is more in line with raising to Foc in the original treatment of Hornstein & Nunes (2002) and Nunes (2004): It triggers a morphological fusion between the main verb and the light verb, even when the latter category is silent (yet prosodically prominent, also cf. Tsai 2014).

Our prosodic study thus provides compelling evidence for the claim that the verb copying of (13a) is triggered by the focus placement on the light verb FOR, which in turn lends credible support to the applicative analysis of Chinese whining *wh*, as well as the implicit light verb syntax in general.

Now we are in a position to address the embeddability issue: Yang (2021) argues quite convincingly that the whining force is available only in the root context (see also Pan 2015): Once (11a) is embedded as the complement clause of *xiangzhidao* 'wonder', only an indirect *for what*-question is available, as in (14a), whereas the whining construal in question is completely ruled out, as in (14b):

(14)   ta   xiangzhidao   [ni ku   shenme].
        he   wonder   you cry what
        a.   He wonders what you are crying for.   (interrogative)
        b. # He wonders what the heck you are crying for.   (#whining)

As shown by the ill-formedness of (15), a whining construal is impossible for the indirect question:

(15)   * ta   xiangzhidao   [ni ku   shenme   ku].
          he   wonder   you cry what   cry
        'He wonders what the heck you are crying for.'

As one might expect, it is marginally acceptable for a psych-predicate like *huoda* 'furious' to host a whining *wh* in its complement, as in (16). Here the pragmatics involved appears to be compatible at both ends:

(16)   ? wo   hen huoda   [ni ku   shenme].
          I   very furious   you cry what
        a. # I am furious at what you are crying for.   (#interrogative)
        b.   I am furious at what the heck you are crying for.   (whining)

The practice, however, is highly restricted: As illustrated below, a person perspective change degrades the sentence considerably, very much reminiscent of the logophoric construals of long-distance reflexives (cf. Huang & Liu 2000):

(17)   * ta   hen huoda   [ni ku   shenme].
          he   very furious   you cry what
        'He is furious at what you are crying for.'

11.4. Taiwan Southern Min disapproval and whining *how*: a cross-dialectal comparison

Another piece of evidence comes from Taiwan Southern Min (TSM), where there are also three tiers of *how*-construals. As predicted by our truncation analysis, only LHOW and causal MHOW survive embedding, either in the interrogative complement position of (18b,c) or in the adverbial position of (19b,c). By contrast, HHOW is consistently ruled out in the same environments, as evidenced by (18a) and (19a):[12]

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(18) a.* I   siūnnbehtsaiiánn [**ántsuánn** hȧksing   ētàng   thàn tsiah-tsē   tsînn].
        he   wonder   how   student   can   earn such-amount money
        '*He wonders about [(the inexpectancy) that a student could earn such amount
        of money].' (*HHOW)

    b.   I   siūnnbehtsaiiánn [hȧksing   **ántsuánn** ētàng   thàn tsiah-tsē   tsînn].
        he   wonder   student   how   can   earn such-amount money
        'He wonders [how come a student could earn such amount of money].'
        (causal/*mirative MHOW)

    c.   I   siūnnbehtsaiiánn [hȧksing   ētàng   **ántsuánn** thàn tsiah-tsē   tsînn].
        he   wonder   student   can   how   earn such-amount money
        'He wonders [by what means a student can earn such amount of money].'
        (LHOW)

(19) a. * Put-kuán [**ántsuánn** Abîng   ē   tsò tsit-khuán   tāitsì], ...
        no-matter how   Abing   will do   this-sort   thing
        '*No matter [how Abing would do such a thing!], ...
        (*HHOW)

    b.   Put-kuán [Abîng   **ántsuánn** ē   tsò tsit-khuán   tāitsì], ...
        no-matter Abing   how   will do   this-sort   thing
        'No matter [why Abing would do such a thing], ...
        (causal/*mirative MHOW)

    c.   Put-kuán [Abîng   ē   **ántsuánn** tsò tsit-khuán   tāitsì], ...
        no-matter Abing   will how   do   this-sort   thing
        'No matter [by what means Akiu will handle this matter], ...'
        (LHOW)

It is also attested in TSM that LHOW is blocked when the *how*-clauses are embedded as the complement of *ìguā* 'surprised', as in (20c). As expected, HHOW and mirative MHOW survive the same construal without trouble, as illustrated by (20a,b) respectively.

(20) a.   I   tsin ìguā   [**án-tsuánn** hȧk-sing ē-tàng   thàn tsiah-tsē   tsînn].
        he   very surprised how   student can   earn such-amount money
        'He is surprised at [(the inexpectancy) that a student could earn such amount
        of money].'   (HHOW)

    b.   I   tsin ìguā   [hȧk-sing **án-tsuánn** ē-tàng   thàn tsiah-tsē   tsînn].
        he   very surprised student how   can   earn such-amount money
        'He is surprised at [(the inexpectancy) that a student could earn such amount
        of money].'   (mirative/*causal MHOW)

    c. * I   tsin ìguā   [hȧk-sing ē-tàng   **án-tsuánn** thàn tsiah-tsē   tsînn].
        he   very surprised student can   how   earn such-amount money
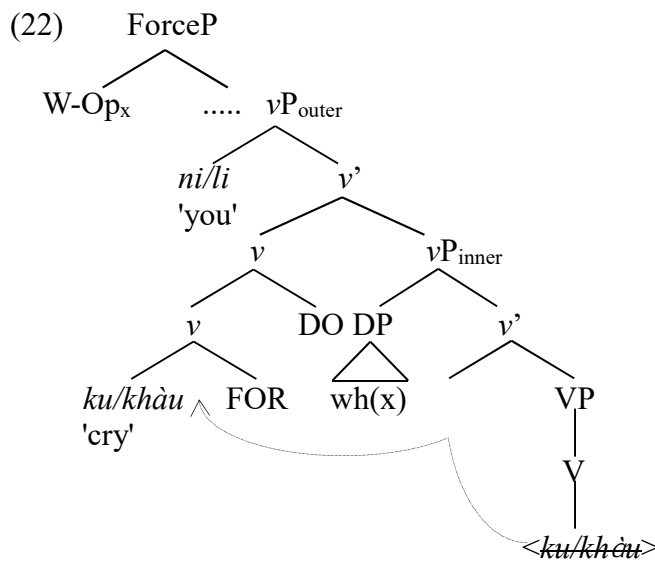
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comprehensive survery of a variety of *how*-questions and *why*-questions in TSM.

'He is surprised at [(the way) how a student can earn such amount of money!].'
(*LHOW)

Interestingly enough, as noted by Lau & Tsai (2020), TSM may employ a non-canonical *how*-question to encode the whining force, as shown below:

(21) Lí   khàu   ántsuánn?!
     you   cry   how
     'What the heck you are crying for!'   (whining)

A unified cartographic analysis of Mandarin and TSM whining *wh*-construals is therefore in order, namely both involving unselective binding from a force operator (W-Op) in the left periphery, as illustrated by the following diagram:

(22)   ForceP
     W-Op$_x$ ..... vP$_{outer}$
            ni/li v'
            'you'
                  v vP$_{inner}$
               v DO DP v'
          ku/khàu FOR   wh(x)   VP
          'cry'   V

                                        <*ku/khàu*>

As readily predicted by our analysis, TSM whining *how* is blocked in the complement of *siūnnbehtsaiiánn* 'wonder', as in (23b), where only an applicative question reading is allowed, as evidenced by (23a).

(23)   I   siūnnbehtsaiiánn   [lí   khàu   ántsuánn].
        he   wonder   you   cry   how
        a.   He wonders what you are crying for.   (interrogative)
        b. # He wonders what the heck you are crying for.   (#whining)

11.5. Vietnamese disapproval and whining *how*: a cross-linguistic comparison:

On the typological front, Vietnamese is no less analytic/isolating than Chinese in many respects. So it would be interesting to check if it also patterns with Mandarin and TSM in regard to the embeddability of non-canonical usages of *sao* 'how (come)' and *gì* 'what'.[13] As reported by Tran Phan (p.c.), HHOW and mirative MHOW are blocked in Vietnamese when embedded under *muốn biết* 'want to know, wonder', while a causal question is still available, as evidenced

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[13] Special thanks to Tran Phan for supplying Vietnamese data for the embeddability tests.

by (24) and (25):[14]

(24) Nó   muốn biết   [sao Akiu   có thể   làm việc   này]
     he   want know   how Akiu   can   do thing   this
     a. # He wonders about [(the inexpectancy) that Akiu would do such a thing].'
           (#HHOW)
     b.   He wonders [how come Akiu would do such a thing].'
           (causal/*mirative MHOW)

(25) Nó   muốn biết   [sao sinh viên   có thể kiếm được số   tiền   này]
     he   want know how student   can   earn gain amount money   this
     a. # He wonders about [(the inexpectancy) that a student could earn this amount
           of money]'
           (*HHOW)
     b.   He wonders [how come a student could earn this amount of money].'
           (causal/*mirative MHOW)

On the other hand, LHOW is quite comfortable in the same environment with the typical manner/instrument interpretations of (26) and (27):

(26) Nó   muốn biết   [Akiu   có thể   làm việc   này làm sao]
     he   want know   Akiu   can   do thing   this how
     'He wonders [by what means Akiu would do such a thing].'
     (LHOW)

(27) Nó   muốn biết   [sinh viên có thể   kiếm làm sao được số   tiền   này]
     he   want know student   can   earn how   gain amount money this
     'He wonders [by what means a student can earn this amount of money].'
     (LHOW)

The following tests with *bất luận* 'no matter' yields similar results, as shown by the respective contrast between (28-29) and (30-31):

(28) Bất luận   [sao Akiu   có thể làm   việc   này] …
     no.matter how Akiu   can   do   thing this
     a. # No matter [how Akiu would do such a thing!] …
           (*HHOW)
     b.   No matter [how come Akiu would do such a thing] …
           (causal/*mirative MHOW)

(29) Bất luận   [sao sinh viên   có thể   kiếm được số   tiền   này]…
     no.matter how student   can   earn gain amount money this
     a. # No matter [how a student could earn this amount of money!]…'
           (*HHOW)
     b.   No matter [how come a student could earn this amount of money]….
           (causal/*mirative MHOW)

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[14] The hierarchical distinction between HHOW and MHOW in Vietnamese is not as clearly cut as in Chinese. We will therefore leave it aside for the time being, and focus on the availability of relevant interpretations (i.e., disapproval, mirative, causal and instrumental).

(30) Bất luận   [Akiu có thể làm   việc này   làm sao]
no.matter Akiu can   do   thing this   how
'No matter [by what means Akiu would do such a thing].'
(LHOW)

(31) Bất luận   [sinh viên có thể kiếm   làm sao được số   tiền   này]…
no.matter   student can   earn   how   gain amount money this
'No matter [by what means a student could earn this amount of money]…'
(LHOW)

As expected, *kinh ngạc* 'surprised' behaves exactly the opposite of *muốn biết* 'wonder' in not being able to host causal and instrumental questions, as in (32b) and (33), while allowing disapproval and mirative construals freely, as in (32a):

(32) Nó rất ngạc nhiên là   [sao sinh viên có thể kiếm được số   tiền   này]
he   very surprised   that how student can   earn gain amount money this
a. He is surprised at [(the inexpectancy) that a student could earn this amount of money!]'
(HHOW/mirative MHOW)
b. # He is surprised at [how come a student could earn this amount of money].'
(*causal MHOW)

(33)*Nó rất ngạc nhiên là   [sinh viên có thể kiếm làm sao được số   tiền   này]
he   very surprised   that student   can   earn how   gain amount money this
'He is surprised at [how a student could earn this amount of money]'
(*LHOW)

Finally, our embeddability test reveals that the whining construal is again banned from Vietnamese indirect questions such as (34), where only a typical *what for* reading is available. (35) shows that verb copying is blocked in the same environment, just like its Mandarin and TSM counterparts:

(34) Nó   muốn biết [mày khóc gì].
he   wonder   you   cry   what
a.   He wonders what you are crying for.   (interrogative)
b. # He wonders what the heck you are crying for.   (#whining)

(35)*Nó   muốn biết [mày khóc gì   mà   khóc].
he   wonder   you   cry   what PRT   cry
'*He wonders what the heck you are crying for!'   (*whining)

11.6. Concluding Remarks

In sum, the truncation analysis provides a plausible account of the embeddability of disapproval/whining *wh*-construals in Mandarin Chinese. A further investigation also reveals that the root-subordinate asymmetry is not as clear-cut as previously thought, where prominent features such as causality and mirativity play an important role across-the-board. From the vantage point of comparative syntax, we are able to draw substantial support from Vietnamese

and Taiwan Southern Min (TSM). We believe that this line of research will shed new light on the nature of syntax-pragmatics mapping under the cartographic approach, and advance our understanding of how s-selection and c-selection work together to license syntactic complementation.

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