Light predicate raising in the Mandarin post-VP adverbial nominal constructions

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In Mandarin, a nominal may follow a string that is composed of a monomorphemic verb and its monomorphemic object. The nominal exhibits the same constraints as a preverbal PP. Also, unlike a canonical or non-canonical object, such a nominal cannot be deleted. It is argued that such a nominal is the object of a preposition; the PP is base-generated as a left adverbial of a shortest transitive VP; and after the leftward raising of the light VP and deletion of the preposition, the nominal surfaces to the right of the VP. Based on this study, the paper reports a form economy in syntactic operations.

Keywords: post-object nominal, extraposition, light predicate raising, PP-stranding, minimal length

1.   Introduction

In Mandarin, a nominal may follow a string that is composed of a monomorphemic verb and its monomorphemic direct object under certain conditions. In (1a) (Chao 1968; 1987: 132), *chu* 'produce' is a verb, *ban* 'version' is its direct object, and the underlined *yi-bu shu* 'a book' is a $\underline{P}$ost-$\underline{O}$bject $\underline{N}$ominal (PON). Similarly, in (1b), *che* 'withdraw' is a verb, *bing* 'army' is its direct object, and the underlined *Afuhan* 'Afghanistan' is also a PON.[1]

(1)   a.   出版一部書
          chu-ban   *yi-bu*   *shu*   (O-PON)
          produce-version   one-CL   book
          'publish a book'

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b. 撤兵阿富汗
    che   bing Afuhan   (V-PON)
    withdraw army Afghanistan
    'withdraw the army from Afghanistan'

The PON *yi-bu shu* 'a book' in (1a) is semantically associated with the object *ban* 'version'. It specifies that it is a version of a book, rather than a version of something else (e.g., a journal paper, a magazine). I therefore call such a PON <u>O</u>bject-PON (O-PON). The PON *Afuhan* 'Afghanistan' in (1b) is semantically associated with the combination of the verb *che* 'withdraw' and its object *bing* 'army'. It specifies the source of the action denoted by the combination. It does not specify any property of the object *bing* 'army' at all. I therefore call such a PON <u>V</u>P-PON (V-PON). Thus, an O-PON has — but a V-PON does not have — a direct semantic relation with the nominal to its immediate left. The main goal of this paper is to give a syntactic analysis of V-PON. One can see that an O-PON functions like an attributive of the object to its left, whereas a V-PON functions like an adverbial of the VP to its left.

In addition to this O-PON and V-PON comparison, there are two more comparisons. In Mandarin, an adverbial typically occurs preverbally. If a V-PON functions like an adverbial, a comparison between a pre-verbal adverbial and a V-PON is necessary. Moreover, this paper also compares the V-PON construction with another construction that has a post-verbal adverbial-like nominal, a non-canonical object (NCO) construction, such as (2) (e.g. Lin 2001; Barrie & Li 2015; Zhang 2018).

(2)   吃餐廳
      chi canting
      eat restaurant
      'eat in a restaurant'

I elaborate major differences between a V-PON and an O-PON in §2. I then report some major properties of V-PONs in §3 and some major properties of the VO string in the V-PON constructions in §4, comparing with pre-verbal PP adverbials and NCOs. In §5, I challenge the double object analysis and the analysis that treat a V-PON as the object of a complex verb. In §6, I propose my analysis and argue against a light verb analysis of the construction. The paper concludes in §7.

2.   Major differences of V-PONs from O-PONs

One important difference between an O-PON and a V-PON is that the former —
but not the latter — is semantically related to the object of the verb of the clause.
In items (3) through (6), I give examples of various semantic relations between an
O-PON and the object of the verb (the types are not exhaustive). In the examples,
the underlined part is an O-PON, which is semantically associated with the boxed
object of the verb.

💧 The O-PON specifies the token of individual kind denoted by the object.

(3) a. 拜師侯寶林
         bai-shi   Hou Baolin
         take-teacher Hou Baolin
         'take HB as a teacher'

     b. 取名林啟泰
         qu-ming   Lin Qitai
         take-name Lin Qitai
         'take Lin Qitai as one's name'

     c. 娶妻陳素雲
         qu-qi   Chen Suyun
         marry-wife Chen Suyun
         'marry Chen Suyun as one's wife'

💧 The O-PON specifies the quantity of the object.

(4) a. 獲賠10萬
         huo-pei   shiwan
         receive-compensation 100,000
         'receive 100,000 yuan compensation'   (Yang & Zhou 2006: 146)

     b. 藏書萬冊
         cang-shu   wan-ce
         possess-book 10,000-CL
         'possess 10,000 books'

💧 The O-PON is a licensor of an object that is a relational noun.[2]

(5) a. 提名候選人

　　　 ti-ming　　*houxuanren*
　　　 give-name candidate
　　　 'nominate candidates'

　　 b. 入籍德國

　　　 ru-ji　　　　　*Deguo*
　　　 enter-citizenship Germany
　　　 'get naturalized as a German citizen'

　　 c. 入境大陸

　　　 ru-jing　　　*dalu*
　　　 enter-boarder mainland
　　　 'enter the Mainland'

　　 d. 你去跟蹤他

　　　 Ni　qu gen-zong　　ta
　　　 you go follow-trace he
　　　 'Go to track him.'

💧 The O-PON can also be a nominalized clause that specifies content of the object.

(6) a. 該記者造謠 總統貪污。

　　　 Gai jizhe　　zao-yao　　　zongtong　tanwu.
　　　 this journalist make-rumor president corrupt
　　　 'This journalist spread the rumor that the president was corrupted.'

　　 b. 兩名無業男子涉嫌 收藏和轉手移交16萬圓賊贓。

　　　 Liang-ming wu-ye　nanzi she-xian　　shoucang he　zhuanshou yijiao
　　　 two-CL　　no-job man　get-suspect keep　　and shift　　move
　　　 160,000　yuan zei-zang.
　　　 160,000 yuan stolen-goods
　　　 'Two unemployed men got suspected of keeping and transferring 160,000 yuan stolen-goods.'

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2. A relational noun is a predicate-like noun that needs to be licensed semantically in the context by another nominal (a subject-like nominal). Nouns such as ***neighbor, capital, length***, body part nouns (e.g. ***arm, head***), and kinship terms are all relational nouns. For example, in ***Japan's capital***, the word ***Japan*** is the licensor of the relational noun ***capital***. Nouns such as ***desk*** and ***apple*** do not need to be semantically licensed by another nominal and thus they are not relational nouns.

In all the examples in (3) through (6), the underlined part (i.e. the O-PON) elaborates a property or token of the object (the boxed part) semantically. An O-PON is not an adverbial of the VO string to its left. This is different from a V-PON. In (1b), the V-PON *Afuhan* denotes the source of the action withdrawing the army, and it does not elaborate any property of the object *bing* 'army' semantically.

Another important difference between O-PONs and V-PONs is that many of the former (although not all of them) but none of the latter allow an aspect marker between the VO string and the PON, as shown in (7) and (8), respectively (see also Footnote 4).

(7) a. 獲賠了10萬
         huo-pei-le   *shiwan*
         get-compensation-PRF 100,000
         'got 100,000 yuan compensation'
     b. 出版了一部書
         chu-ban-le   *yi-bu   shu*
         produce-version-PRF one-CL book
         'published a book'
     c. 起草過一份報告
         qi-cao-guo   *yi-fen   baogao*
         write-draft-EXP one-CL report
         'drafted a report'

(8) 撤兵(*了)阿富汗
     che   bing (-le) Afuhan*
     withdraw army-PRF Afghanistan
     Intended: 'withdrew the army from Afghanistan'

In my view, O-PONs belong to the type of nominals that occur with a Classificatory Noun Incorporation cluster (Mithun 1984: 863), such as the underlined part in the Chamorro example in (9a) and the Mohawk example in (9b, c) (the boxed part is the incorporated noun). This type of Noun Incorporation (NI) construction is similar to the verbal classifier construction in sign languages, such as the Taiwan Sign Language example in (10a) and the Israeli Sign Language example in (10b).

(9) a. *Gäi-ga'*   *un ga'lagu ennao na patgun.*
         Agr.have-pet a   dog   that   L   child
         'That child has a pet dog.'   (Chung & Ladusaw 2004: 89)
     b. *... sha'te:ku niku':ti rabahbot wahu-tsy-ahni:nu ki   rake'niha.*
         eight   of.them bullhead he-fish-bought   this my.father
         '... my father bought eight bullheads.'   (Mithun 1984: 870)

c. *kwískwis y-a'-t-ho-⎡nyukwal⎤-íhshta-'.*
pig   TRS-AOR-DPL-3M.3M-⎡snout⎤-grab-PUNC
'He grabbed the pig by its nose.'   (Rosen 1989: 301)

(10) a. *WOLF ANIMAL-RUNNING*
'The wolf ran.'   (Smith 1989: 137)

b. *BOOK INDEX$_b$ HE $_a$GIVE-CL:flat-C$_1$*
book   that   he   wide-flat-object-he-give-me
'He wide-flat-object-handed-me a book.'('He handed me a book.')

(Meir 1999: 304)

According to Mithun (1984: 864), in a Classificatory NI construction, the NI clus-
ter "is accompanied by a more specific external NP which identifies the argument
implied by the IN". In (9a), for example, the nominal *un ga'lagu* 'a dog' specifies
the meaning of the incorporated noun *ga'* 'pet': the pet is a dog, not a cat or some-
thing else. Also, in (10a), the nominal WOLF specifies the meaning of ANIMAL,
which is the argument of the verb RUNNING: the animal is a wolf, not a dog
or any other kinds of animal. We can see a parallel relation between an O-PON
and the object to its left. In (3a), for example, the object *shi* 'teacher' is accompa-
nied by a more specific nominal *Hou Baolin*, which specifies that the teacher is
Hou Baolin, not anyone else. It is possible that an O-PON follows an incorporated
nominal, similar to the additional nominal in a Classificatory NI construction.

As mentioned at the beginning of this paper, the verb and its object preceding
an O-PON must both be monomorphemic (This is also true of the verb and its
object preceding a V-PON, to be discussed in §4.2). If the verb is replaced with
a dimorphemic form, as in (11b), or the noun is replaced with a dimorphemic
form, as in (11c), the form is not acceptable:

(11) a. 提名候選人   (= (5a))
ti-ming   houxuanren
give-name candidate
'nominate candidates'

b. *提出名候選人
**ti-chu-ming   houxuanren*
give-produce-name candidate

c. *提名字候選人
**ti-ming-zi   houxuanren*
give-name-name candidate

As I stated above, an O-PON may occur in a Classificatory NI construction,
where a noun in a complex (a possessive DP or a Small Clause) adjoins to V.

In the rest of the paper, I focus on the syntax of V-PONs.

3.   The non-object properties of V-PONs

In this section, we first see the adverbial readings of V-PONs (§3.1), and then see how they are similar to a preverbal PP and different from the object or NCO of a verb, from three perspectives (§3.2).

3.1   Various adverbial readings of V-PONs

Unlike an O-PON, a V-PON is not semantically related to the object of the verb to its left. Instead, it is semantically related to the whole verbal expression to its left. In other words, it has an adverbial reading. In (12) through (17), I give examples of various adverbial types of V-PONs, and provide a possible overt preposition that semantically matches the intended meaning of the construction (see §6.3 for a discussion of the preposition forms).[3]

💧 The V-PON denotes the source of the VO string.

(12)   a.   撤兵阿富汗
            che   bing Afuhan
            withdraw army Afghanistan
            'withdraw the army from Afghanistan'
        b.   起錨（於）黃埔港
            qi mao   (yu) Huangpu Gang
            lift anchor   at   Huangpu Port
            'start a journey from the Huangpu Port'
        c.   啟程（於）山東
            qi   cheng   (yu) Shandong
            start journey   at   Shandong
            'start a journey from Shandong'

💧 The V-PON denotes a benefactive or malefactive role of the VO string.

(13)   a.   法陸空罷工添亂歐國盃。
            Fa   lu-kong bagong tian luan   Ouguobei.
            France land-air strike   add trouble European.Football.Championship
            'The land and air traffic strikes added troubles to the UEFA.'

(Tsai et al. 2022: 5)

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3. To focus on the typical V-PON construction, where the verb is a monotransitive one, I do not discuss constructions that have a bitransitive verb, such as *zeng* 'give' or *juan* 'donate'.

b. 造福（於）人類
    zao   fu   (yu) renlei
    make benefit   for human
    'make benefit for the human beings'

💧 The V-PON denotes a location of the VO string.

(14) a. 稱霸世界
          cheng ba   shijie
          claim dominance world
          'seek hegemony in the world'
      b. 待命（在）城外
          dai ming (zai) cheng-wai
          wait order   at   city-outside
          'wait for an order outside of the city'   (Feng 2002: 517)
      c. 葬身（於）黃河
          zang shen (yu) Huang-He
          bury body   at Yellow-River
          'die in the Yellow River'

💧 The V-PON denotes a purpose of the VO string.

(15) 備戰亞運會
      bei   zhan Yayunhui
      prepare battle the.Asian.Game
      'prepare for the competitions in the Asian Game'

💧 The V-PON denotes a comitative of the VO string.

(16) a. 伊朗斷交沙國。
          Yilang duan jiao   Shaguo.
          Iran   break relation Kingdom.of.Saudi.Arabia
          'Iran broke diplomatic relations with the Kingdom of Saudi Arabia.'
                                                              (Tsai et al. 2022: 4)
      b. 外商爭相「攀親」山東農業。
          Wai-shang   zhengxiang "pan qin"   Shandong nongye.
          foreign-business.man compete.to claim kinship Shandong agriculture
          'Foreign businessmen compete to establish relations with Shandong agri-
          culture.'

💧 The V-PON denotes the goal of the VO string.[4]

(17) a. 投資（到）海外
　　　tou　zi　(dao) haiwai
　　　invest capital to　overseas
　　　'invest overseas'

　　b. 效忠（於）國王
　　　xiao zhong　(yu) guowang
　　　pay　loyalty to　king
　　　'pay loyalty to the King'

　　c. 遷居（到）美國
　　　qian ju　(dao) Meiguo
　　　move residence to　the USA
　　　'move to USA'

　　d. 致函（到）國際奧委會主席
　　　zhi　han　(dao) Guoji-Aoweihui-Zhuxi
　　　issue letter to　International-Olympic-president
　　　'issue a letter to the president of the International Olympics'

It has been assumed that the preposition is just deleted in this type of V-PON construction (e.g. Yang & Zhou 2006, Zhang Yisheng 2010). In other words, such a V-PON is a post-verbal PP with a deleted P.

The examples above show that V-PONs can denote a source, benefactive or malefactive, location, purpose, comitative, and goal. However, as noted by Yang &

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4. The construction where a VO string is followed by a goal-denoting nominal is structurally ambiguous between a V-PON and a canonical NI construction (not a classificatory one introduced in §2). (i) is an NI example, where the object *mətqə* 'butter' is incorporated into the verb *rkele* 'spread on', and the goal *kawkaw* 'bread' functions as an object of the complex verb. In this construction, the goal does not occur with any preposition, and the complex verb formed by the NI allows the perfective aspect marker AOR (i.e. Aorist). In the V-PON construction in (17a), a goal preposition is allowed, and like other V-PON constructions such as (8), no aspect marker is allowed, as shown in (iia). In contrast, in the NI construction in (iib), the object of the transitive verb is incorporated into the verb. In this case, no goal preposition is allowed, but an aspect marker is possible. Importantly, an NI construction is not a V-PON construction.

(i) *ətəg-e　kawkaw　mətqə-rkele-nen.*　[Chukchee]
　　father-ERG bread.ABS butter-spread.on-AOR.3SG:3SG
　　'The father spread the butter on the bread.'　(Gerdts 1998: 91)

(ii) a. **tou　zi　guo dao haiwai*
　　　invest capital EXP to overseas

　　b. *tou-zi-guo　(*dao) haiwai*
　　　invest-capital-EXP　to　overseas
　　　'invested oversees'

Zhou (2006: 153), a V-PON does not denote an instrument, as shown in (19). So far, I have not seen any syntactic impact of this semantic gap of V-PONs. Unlike V-PONs, NOCs can denote an instrument, as seen in (20).

(18) a.   用毛筆寫字
           yong mao-bi   xie   zi
           with brush-pen write character
           'write characters with a brush-pen'
      b.   用大刀切肉
           yong da dao   qie rou
           with big knife cut meat
           'cut meat with a big knife'

(19) a.   *寫字毛筆
           **xie   zi   mao-bi*
           write character brush-pen
      b.   *切肉大刀
           **qie rou   da dao*
           cut meat big knife

(20) a.   寫毛筆
           xie   mao-bi
           write brush-pen
           'write with a brush pen'
      b.   切大刀
           qie da dao
           cut big knife
           'cut with a big knife'

An interpretation issue with V-PONs should be clarified. In the absence of an overt preposition, how do we know that the missing preposition is a source preposition in (12a), but a goal preposition in (17a)? (I thank an anonymous reviewer for asking this question.) Why is there never a confusion in communication in this respect? One answer can be that in such a situation, the reading is decided by the meaning of the verb. It is unlikely for the verb *withdraw* to occur with a goal PP (headed by *to*) and for the verb *invest* to occur with a source PP (headed by *from*). A V-PON may occur without an overt preposition because people can make use of context to deliver or retrieve the intended meaning.

   A genre issue also needs to be addressed. It has been generally recognized that V-PONs are found most frequently in news headlines (e.g. Qin 2023). However, as pointed out by Feng (2002: 518), Tsai (2017: 3), and Tsai et al. (2022: 5), certain types of V-PONs are quite productive in the oral speech, especially if they denote

a goal or benefactive/malefactive role. Their examples include those in (21). I add more examples in (22).

(21) a. 報紙一直吹牛他。
          Baozhi   yizhi   chui niu ta.
          newspaper all.the.time blow cow he
          'Newspapers are boasting about him all the time.'   (Tsai et al. 2022: 6)

      b. 我感恩你。
          Wo gan en   ni.
          I   feel gratitude you
          'I feel gratitude to you.'   (Li & Wu 2017: 350)

(22) a. 我們立志造福人類。
          Women lizhi   zao fu   renlei.
          we   be.determined make benefit human
          'We are determined to make benefit for human beings.'

      b. 沒想到他落戶邊疆。
          Mei xiangdao ta luo   hu   bianjiang.
          Not expect   he settle.down residence borderland
          'Unexpectedly, he settled down in a borderland.'

      c. 他早晚會任職教育部。
          Ta zao-wan hui ren zhi Jiaoyu-Bu.
          he early-late will take job Education-Bureau
          'He will take a job at the Education Bureau sooner or later.'

      d. 他有充分的理由遷怒他們。
          Ta you chongfen liyou qian nu   tamen.
          he have enough   reason place anger they
          'He has reason enough to take out his own anger on them.'

Even for those that occur only in news headlines, their syntactic structures still need analyzing. I have shown how V-PONs are different from O-PONs in §2, and how V-PONs are semantically similar to adverbials, although they occur post-verbally, in this subsection. For the rest of this section, I report three distinctions of V-PONs from objects of verbs and NCOs.

3.2   A. The same combination restriction on a preverbal PP

A V-PON must correlate with a pre-verbal PP. This can be seen in the following aspects.

   If a preposition and a nominal never form a PP, the nominal cannot occur as a V-PON. For example, *meitian* 'everyday' and *daochu* 'everywhere' are never

complements of any preposition, as seen in (23a); and they cannot be V-PONs, as seen in (23b).

(23)   a.   美國（*在）{每天/到處}撤軍。
       *Meiguo (*zai) {meitian/daochu}   che   jun.*
       USA   at   everyday/everywhere withdraw army
       'The USA withdraws its army {everyday/from everywhere}.'
   b.   *美國撤軍{每天/到處}。
       **Meiguo che   jun {meitian/daochu}.*
       USA   withdraw army everyday/everywhere

Note that I do not claim that whenever a nominal can follow a preposition, it must be able to be a V-PON. Thus, the above generalization goes in one direction only. It shows the PP source of a V-PON, rather than any mutual correlation between a preverbal PP and a V-PON. We have already seen (19), where the instrument object of *yong* 'with' cannot occur as a V-PON.

Moreover, if a nominal denotes a functive in an eventuality, it cannot be the complement of any preposition in the language, as seen in (24a) (See Creissels 2014 for the term functive; the PP *as a negotiator* in *I was sent as a negotiator* is a functive). A V-PON cannot express a functive, as seen in (24b). However, an NCO, which follows a verb in the absence of a theme object, can express a functive, as seen in (24c).

(24)   a.   *以前衛踢球
       **yi qianwei ti   qiu*   *preverbal PP*
       as forward kick ball
       Intended: 'play soccer as a forward'
   b.   *踢球前衛
       **ti   qiu qianwei*   *V-PON*
       kick ball forward
   c.   踢前衛
       ti   qianwei   *NCO*
       kick forward
       'play in soccer as a forward'

Furthermore, as seen in (25a), *yi kuanshi* 'intended: with style' is not a possible pre-verbal PP, and the V-PON *kuanshi* in (25b) is not acceptable, either. However, the NCO *kuanshi* in (25c) is acceptable.

(25)   a.   *以款式穿衣
            **yi   kuanshi chuan yi*   *preverbal PP*
            with style   wear   clothes
       b.   *穿衣款式
            **chuan yi   kuanshi*   *V-PON*
            wear   clothes style
       c.   穿款式
            chuan kuanshi   *NCO*
            wear   style
            'wear clothes stylistically'

Such contrasts show that the choice for a V-PON, but not an NCO, is subject to the same combination constraint on a preverbal PP. All of these show that if an adverbial cannot be expressed by a preverbal PP, it cannot be a V-PON.

The property reported in this subsection suggests that a V-PON is derivationally related to a pre-verbal PP.

3.3   B. The same interpretation as a preverbal PP

A V-PON has exactly the same meaning as its correlated pre-verbal PP (cf. Qin 2023). For example, the V-PON *cheng-wai* 'the outside of the city' in (26a) must have the same meaning as the pre-verbal PP *zai cheng-wai* 'outside the city' in (26b). This is in contrast to an NCO. In (27a), the locative NCO *shitang* 'dining-hall' does not have a strict location meaning, but the pre-verbal PP *zai shitang* 'at dining-hall' in (27b) does have one. The NCO just means a way of eating: eating the food provided via dining hall, instead of by one's own cooking. The NCO construction allows the meaning that one purchases the food from a dining hall and then eats it in another place (at home or in an office, as well as in a dining hall). See Zhang (2018) for a claim that all NCOs restrict event types.

(26)   a.   待命城外
            dai   ming cheng-wai   *V-PON*
            wait order city-outside
            'wait for an order outside of the city'
       b.   在城外待命
            zai cheng-wai   dai   ming
            at   city-outside wait order
            'wait for an order outside of the city'

(27) a.   吃食堂
      chi shi-tang   *NCO*
      eat dining-hall
      'eat a meal that is provided by a dining hall'
   b.   在食堂吃
      zai shi-tang   chi
      at dining-hall eat
      'eat in a dining hall'

The property reported in this subsection strengthens the conclusion reached in the previous subsection: a V-PON is derivationally related to a pre-verbal PP.

3.4   C. The ban on ellipsis

A V-PON cannot be elided (Qin 2023), as seen in (28a), although other kinds of post-verbal nominals may, including an NCO, as seen in (28b) (Barrie & Li 2015).

(28) a.   *美國撤兵伊拉克，英國也撤兵~~伊拉克~~。   V-PON
      **Meiguo che   bing Yilake, Yingguo ye   che   bing ~~Yilake~~.*
      USA   withdraw army Iraq   UK   also withdraw army ~~Iraq~~
   b.   他常吃豪華餐廳，我不常吃~~豪華餐廳~~。   NCO
      Ta chang chi haohua canting,   wo bu chang chi ~~haohua canting~~.
      he often eat fancy restaurant I not often eat ~~fancy~~   ~~restaurant~~
      'He often eats in fancy restaurants, but I don't.'

Chao (1968:751) notes that "A preposition does not usually omit its object, as an ordinary transitive verb normally does when the object is in the near context." Thus, the ban on preposition stranding in Mandarin is seen in ellipsis:

(29) 美國從伊拉克撤出軍事人員，英國也從（*伊拉克）撤出軍事人員。
   *Meiguo cong Yilake chechu   junshi-renyuan,   Yingguo ye   cong *(Yilake)*
   USA   from Iraq withdraw military-personnel UK   also from Iraq
   chechu   junshi-renyuan.
   withdraw military-personnel
   'The USA withdrew their military personnel from Iraq, and so did the UK.'

We are thus able to explain the contrast between a V-PON and an NCO seen in (28b): if a VON is the complement of a preposition, it cannot be elided; but if an NCO is not the complement of a preposition, it can be elided.

   The property reported in this subsection strengthens the conclusion reached in previous subsections: a V-PON is derivationally related to a pre-verbal PP.

After introducing how a V-PON is different from other types of post-verbal nominals, in the next section, I show how the VO string to the left of a V-PON is also different from the VO string in other constructions.

4.   The VP status and the lightness of the VO string to the left of a V-PON

What is the morpho-syntactic status of the VO string in a V-PON construction, and why must it be dimorphemic? The two questions are answered in §4.1 and §4.2 respectively.

4.1   The VO string as a VP

All eventive verbs allow an aspect marker in Mandarin. The VO string in a V-PON construction can be eventive, but it disallows any aspect marker, as seen in (30):

(30)   美國撤軍（＊了）阿富汗。
 *Meiguo che   jun   (*le) Afuhan.*
 USA   withdraw army   PRF Afghanistan
 'The USA withdrew the army from Afghanistan.'

A plausible account for the restriction is that the VO string is a transitive VP, instead of a verb. The VP ends with an object. Since no aspect marker occurs between an object and another expression, the rejection of an aspect marker with the VO string in a V-PON construction is explained.

4.2   The minimal length of a syntactic element

One salient property of this VP is that both the verb and its object must be monomorphemic. Compared with the well-formed (31a), the O part is dimorphemic in (31b), and the V part is dimorphemic in (31c). Neither one is acceptable.

(31) a. 撤軍阿富汗
         che   jun   Afuhan
         withdraw army Afghanistan
      b. *撤軍隊阿富汗
         **che   jun-dui   Afuhan*
         withdraw army-troop Afghanistan
      c. *撤離軍阿富汗
         **che-li   jun   Afuhan*
         withdraw-leave army Afghanistan

The dimorphemic restriction on a VO string in a V-PON construction is also observed in the absence of an aspect marker for the verb in the VO string, as seen in (32a). In contrast, the verb with an NCO allows an aspect marker, as seen in (32b).

(32) a. 美國撤（*過）軍阿富汗。
         Meiguo che   (-guo) jun   Afuhan.*   V-PON
         USA   withdraw EXP   army Afghanistan
         'The USA withdrew the army from Afghanistan.'
      b. 我切過那把大刀。
         Wo qie-guo na   ba da dao.   NCO
         I   cut-EXP that CL big knife
         'I cut things with that big knife.'

Moreover, in the following pre-verbal PP construction, the VO string is not subject to the dimorphemic constraint. In (33a), the object *jun-dui* 'army' alone has two morphemes (in two syllables), and in (33b), the transitive verb *che-li-le* 'withdrew' alone has three morphemes (in three syllables).

(33) a. 馬克宏威脅要從馬里撤軍隊。
         Makehong weixie yao cong Mali che   jun-dui.
         Macron   threat will from Mali withdraw army-troop
         'Macron threats that *pro* will withdraw the army from Mali.'
      b. 美國從阿富汗撤離了該國公民。
         Meiguo cong Afuhan   che-li-le   gai-guo   gongmin.
         USA   from Afghanistan withdraw-leave-PRF that-country citizen
         'The USA withdrew their citizens from Afghanistan.'

Regarding the form of a verb, why is a bare verb in a V-PON construction possible? Unlike a tense marker in languages such as English, the aspect marker for a verb in Mandarin is not obligatory, if the context can provide the relevant information. The two verbs *hui* 'return' and *xi* 'wash' in (34) do not need an aspect marker.

(34) 昨天，他一回家就（了）洗臉。
      Zuotian, ta yi   hui jia, jiu xi-(le)   lian.
      yesterday he as.soon.as return home then wash-(PRF) face
      'Yesterday, he washed his face as soon as he returned home.'

Regarding the form of an argument of a verb, it is well-recognized that bare noun arguments, including bare non-mass noun arguments, are also fine in the language. Thus, in the language, it is possible to have a dimorphemic VO string in other constructions, as seen in the underlined part in (35). But in such constructions, longer forms are still possible. In (35a), instead of *tang* 'soup', one can also say *ji-tang* 'chicken soup'; and in (35b), instead of *jiu* 'wine', one can also say *pi-jiu* 'beer'.

(35) a. 我們煮湯喝。
          Women zhu   tang he.
          we   cook soup drink
          'We cooked soup to drink.'
      b. 我們去喝酒。
          Women qu he   jiu.
          we   go drink wine
          'We are going to drink wine.'

Thus, in constructions like (34) and (35), monomorphemic elements of syntactic constituents are possible, but not obligatory. But in a V-PON construction, the external merge of the verb with its object requires both elements to be monomorphemic.

Not only in a V-PON construction, but also in some other constructions, the elements undergoing merge must be monomorphemic. One such construction is the O-PON construction seen in §2. The VO string there is also dimorphemic. If the object adjoins to V in the Classificatory NI construction, the internal merge applies to the shortest forms, i.e. monomorphemic verbs and monomorphemic nominals only.

Another construction that is built by the internal merge of monomorphemic forms is the following. In Mandarin, if a verb is not followed by a theme object, the head of a post-verbal PP may undergo a P-to-V Incorporation (PI) type of head movement, and the formed verbal cluster may take an aspect marker, like other verbs, as seen in (36).

(36) a. 跑到了公路
          pao-dao-le   gonglu
          run-onto-PRF highway
          'ran onto the highway'

b. 跑向了公路
   pao-xiang-le   gonglu
   run-towards-PRF highway
   'ran towards the highway'

c. 死於車禍
   si-yu   che-huo
   die-from vehicle-accident
   'died in a traffic accident'

As in an NI construction, only a monomorphemic verb and a monomorphemic preposition can be combined in such a PI. Compared to (36b), neither (37a) nor (37b) is possible. The former contains the dimorphemic verb *pao-bu* 'run-step, jog', and the latter contains the dimorphemic preposition *mian-xiang* 'facing-towards, towards'.

(37) a. *跑步向了公路
        **pao-bu-xiang-le   gonglu*
        run-step-towards-PRF highway
     b. *跑面向了公路
        **pao-mian-xiang-le   gonglu*
        run-facing-towards-PRF highway

Thus, in Mandarin, a monomorphemic lexical element, or an element in its single bare root form, is a syntactically meaningful unit. Certain syntactic operations are sensitive to this form economy. The external merge of a monomorphemic verb and its monomorphemic object in a V-PON construction is thus not construction-specific.

If the verb and its object are both monomorphemic, the VO string is a transitive VP in its minimal length. We thus have observed the generalization that the VO string to the left of a V-PON must be a transitive VP in its minimal length.

In this and previous sections, I have shown that a V-PON must be derivationally related to a pre-verbal PP, that it cannot be deleted, unlike some other kinds of post-verbal nominals, including NCOs, and that the VO-string to its left must be a transitive VP in its minimal length, unlike the VO string in some other constructions in the language.

5.   Two flawed analyses of V-PONs

Although many scholars have discussed V-PON constructions (e.g. Li Linding 1983; Xing 1997), the properties of V-PON constructions presented in the previous two sections have not been captured in their analyses. In this section, I rule

out two implausible analyses. Then, a rightward movement of a V-PON will be ruled out in §6.2. Moreover, in §6.4, I argue against one more analysis, where the implicit preposition in a V-PON construction is assumed to head a functional projection.

5.1   The V-PON construction as a double object construction?

In a V-PON construction, a verb is followed by two nominals in a row, and in a double object construction, a verb is also followed by two nominals in a row, as seen in (38a) and (38b) respectively. Can a V-PON construction be a double object construction? Two points can rule out this possibility.

(38) a.   匯款大陸
           hui kuan   dalu
           mail money mainland
           'mail money to the mainland'
      b.   給我很多錢
           gei   wo henduo qian
           give I   a.lot   money
           'give me a lot of money'

First, the theme nominal is adjacent to the verb in a V-PON construction, but not in a double object construction. Thus, the post-verbal theta roles in the two constructions are ordered differently in the two constructions. The theme role has a different syntactic position from another role in syntactic structures. The different positions of the theme role in the two constructions indicate that the two constructions are built differently in syntax.

   Second, the non-theme nominal cannot be elided in a V-PON construction (see (28a)), but can in a double object construction, as seen in (39).

(39)   他給了我一本書，還給了一枝筆。
       Ta gei-le   wo yi-ben shu, hai gei-le   yi-zhi bi.
       he give-PRF I   one-CL book also give-PRF one-CL pen
       'He gave me a book, and also gave me a pen.'

Nevertheless, a reverse double object construction is indeed found in some languages, such as Hakka, as seen in (40a) and (40b). Wu (2021: 608) argues that the second nominal, which denotes a goal, is introduced by a null preposition, and "the null preposition Øp is base-generated phonetically inaudible in the structure of Hakka reverse double objects and this Øp is responsible for Case-licensing its following goal argument."

(40) a. *Gi sung [rhid-gi bid] ngai.*
        he give one-CL pen me
        'He gave a pen to me.'   (Wu 2021: 601)

  b. *Ngai sung [Amin ge   xiongpien] gi-cidga.*
        I   give Amin POSS photo   3SG-self
        'I gave Amin's photos (to) himself.'   (Wu 2021: 606)

Importantly, however, the clause-final PP in (40a) and (40b) is an argument of the bitransitive verb, rather than an adverbial. A V-PON can denote a location, purpose, comitative, etc., which are not seen in double object constructions in Mandarin. I thus conclude that the syntax of V-PON constructions is different from that of (reverse) double object constructions.

5.2   A V-PON as the object of a VO string?

Chen (1995) and many others (see Qin 2023: 38 for many more references) treat the VO string in a PON construction as a transitive verb, taking the PON as its nominal object. This analysis does not consider why a VO string cannot take an aspect marker, unlike other eventive verbs that take a nominal as their object (§ 4.1).[5] Also, the analysis does not consider the contrasts between a V-PON and an object of a verb presented in § 3, for example, unlike an object, a V-PON cannot be deleted. Thus, the analysis is not plausible.

   In this section, I have challenged two analyses of V-PON constructions, concluding that a V-PON construction is not a double object construction, and a V-PON is not the argument of any verb.

6.   Proposal: Light predicate raising

In order to explain the properties of V-PON constructions introduced in § 3 and § 4, and to avoid the problems of the analyses reviewed in § 5, I claim that in a V-PON construction, a light predicate moves to the left of a PP. After the movement, the preposition can be deleted in general, or in a null form in certain cases. In § 6.1 I give a cross-linguistic background for this analysis; and in § 6.2 I give arguments for this analysis. In § 6.3 I tentatively explore the issue that some prepositions cannot occur in a post-verbal position, and some other prepositions cannot occur in a preverbal position. Then, in § 6.4, I compare my analysis with a light verb analysis.

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5. Since V-PONs are nominals, we restrict our discussion to verbs that take a nominal object. Some verbs that take a verbal complement, such as *shefa* 'try', do not allow an aspect marker, but they are irrelevant to our discussion here.

6.1   The non-canonical order in extraposition constructions

Light predicate raising explains the formation of extraposition or heavy XP shift constructions in many languages (e.g., Larson 1989; Barbiers 1995; Cinque 2010: 133; cf. Kayne 1994; Baltin 2006a). Extraposition refers to the state of being in the right peripheral position, instead of the canonical position. For example, the canonical order in (41a) and (42a) is different from that in (41b) and (42b), respectively (Larson 1989: § 2.1.4). The infinitive clause in (41b) and the PP in (42b) show up at the right-edge of the clauses, instead of the canonical positions marked with _.

(41)   a.   *Jack made a promise [to leave] [to Mary].*
     b.   *Jack made a promise _ [to Mary] [to leave by 5:00 p.m. sharp].*

(42)   a.   *Max talked [to Mary] [about Bill].*
     b.   *Max talked _ [about Bill] [to all of the other witnesses].*

Larson (1989) argues that extraposition involves leftward raising of a light predicate, instead of a rightward movement of any heavy element. In the Dutch canonical example in (43a), the locative PP *in een stad* 'in one city' is a left-adjunct of the VP *gewerkt* 'worked'; but in the PP extraposition construction in (43b), the PP follows the VP. In Barbiers (1995), (43b) is derived in (43c), where the VP moves to the left of the PP. The movement is a phrasal movement. (I ignore certain details of his analysis.)

(43)   a.   *Jan   heeft [$_{VP}$ [$_{PP}$ in een stad] [$_{VP}$ gewerkt]].*
        John has   in one city   worked
        'John has worked in one city.'   [Dutch, canonical]
     b.   *Jan heeft _ gewerkt in een stad.*   [PP extraposition]
     c.   *Jan heeft … [$_{VP}$^{i} gewerkt]… [$_{PP}$ in een stad] [$_{VP}$ t^{i}]*

Although Larson (1989) uses the word "light" in the title of his article, he does not elaborate the definition of the lightness of the raised predicate in deriving extraposition and Heavy XP constructions. The heaviness of the right-edge element in such constructions is well-recognized, in terms of the PF length and structural complexity (cf. Wasow 2002: 32–37). The heaviness of the right-edge element is relative to the left-adjacent element. Thus, it seems that in Larson's mind, the heaviness of the right-edge element and the relative lightness of the predicate to its left in such constructions are two sides of the same coin. It is thus plausible to view the constructions in a different perspective: in such constructions, between the recognized heavy element at the right-edge and the element to its left, the latter is not heavier than the former. It is in this perspective that Larson argues for

the movement of the element that is next to the heavy element, i.e. the raising of a light predicate. This is also our perspective: a V-PON surfaces at the right-edge of a clause; we examine the lightness of the VP that is next to a V-PON.

Moreover, since elements that undergo syntactic operations have different morphological properties in different languages, the criterion for a light element can be language-specific.

6.2   PP-Stranding in V-PON constructions

I claim that a V-PON in Mandarin appears in its surface position because of a left-ward raising of a light VP. Moreover, since all three properties reported in §3 suggest that a V-PON is derivationally related to a preverbal PP, one wonders whether it is the PP that moves rightward from a pre-verbal position to the right of the VO string (Yang & Zhou 2006: 146). I rule out this possibility later in this section. The rough structure of (44a) is (44b). The raising of the VP is similar to the raising of the VP in (43c).

(44)   a.   美國撤軍阿富汗。
　　　　　Meiguo che　　jun　Afuhan.
　　　　　USA　　withdraw army Afghanistan
　　　　　'The USA withdrew the army from Afghanistan.'

　　b. $[_{IP} \ldots [_{vP} [_{vP} <\text{Meiguo}>[_{v'} \varnothing [_{VP} [_{PP} \varnothing^{\text{FROM}} \text{Afuhan}] [_{VP} \text{che jun}]]]$

My proposed analysis is based on the following three considerations.

First, in the VO string next to a V-PON, the O is a canonical object of the V, and the verb is a monotransitive verb. This first consideration is fundamentally different from the first two analyses reviewed in §5. Since it is O, rather than the V-PON, that is an argument of the verb, the V-PON does not exhibit the properties of an object (see property C in §3).

This analysis also captures the difference between a V-PON and an NCO, with respect to the occurrence of the theme argument of the verb. A V-PON occurs with the theme object (O) of the verb, and thus the verb must be transitive; but an NCO rejects such an object. In (45a), *xin* 'letter' is the object of *xie* 'write'; in (45b), *mao-bi* 'brush-pen' is an NCO. As seen in (45c) and (45d), the NCO cannot co-occur with the theme object (Lin 2001: 207; Zhang 2018: 1400).[6]

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6. In (ia), *mao-bi zi* 'brush-pen character' is a constituent, where *mao-bi* 'brush-pen' is a classificatory modifier of *zi* 'character'. The constituent is the object of the verb *xie* 'write'. Such a string can follow a demonstrative, like a normal NP, as seen in (ib). In contrast, the unaccept-

(45) a. 寫信
         xie   xin
         write letter
         'write letters'
      b. 寫毛筆
         xie   mao-bi
         write brush-pen
         'write with a brush-pen'
      c. *寫毛筆信
         **xie   mao-bi   xin*
         write brush-pen letter
      d. *寫信毛筆
         **xie   xin   mao-bi*
         write letter brush-pen
         Intended (c and d): 'write letters with a brush pen'

In Zhang (2018), the absence of a theme in an NCO construction shows that the verb there is used as an unergative verb (also see Zhang 2022 for an additional argument for this claim). The presence of the theme argument in a V-PON construction indicates that the verb there remains a transitive verb, and the right-adjacent nominal is its internal argument, a canonical object. Then, the V-PON is not in the position of any argument of the verb. In our structure in (44b), the V-PON *Afuhan* 'Afghanistan', as part of an adverbial, co-occurs with the internal argument of the verb, *jun* 'army'.

    Second, a PP is identified, to host a V-PON. Specifically, a V-PON is the complement of a deleted P, and the PP is an adverbial; this PP is base-generated to the left of a VP, and the whole construction is a PP-stranding construction after raising of the VP. This second consideration is fundamentally different from the analyses reviewed in §5. This PP-stranding analysis is supported by the properties presented in §3, which all show that V-PON is part of a pre-verbal PP. Property A is that if a nominal cannot be the complement of the preposition of a preverbal PP,

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able strings *mao-bi xin* 'brush-pen letter' in (45c) and *xin mao-bi* 'letter brush-pen' in (45d) can neither occur as an object of a verb, nor follow a demonstrative.

(i) a. 我寫毛筆字，不寫原子筆字。
        Wo xie   mao-bi   zi,   bu xie   yuanzi-bi   zi.
        I   write brush-pen character not write ball.point-pen character
        'I write characters with a brush-pen, but not with a ball-point pen.'
     b. 我寫了那些毛筆字。
        Wo xie-le   naxie mao-bi   zi.
        I   write-PRF those brush-pen character
        'I wrote those characters with a brush-pen.'

it cannot be a V-PON. If a V-PON is part of a preverbal PP that gets stranded, the form correlation between the V-PON and a preverbal PP is expected. Property B is that a V-PON has exactly the same meaning as its correlated pre-verbal PP. If a V-PON is a pre-VP PP originally, before the light predicate raising, the meaning identity is expected. Property C is that a V-PON cannot be deleted. If such a nominal is the complement of a P, and the language does not allow P-stranding by deletion, this property is also explained.

After the raising of the light predicate, the preposition in the stranded PP can be deleted or take a null form. See §6.3 for a further discussion about this preposition issue.

Third, it is the light property of the VO string (§4) that leads us to the light predicate raising analysis. Rightward movement of a V-PON does not predict this light property of the VO string.

Note that a V-PON can also be monomorphemic (see (21); contra Feng 2002: 518). Thus, the formation of a V-PON construction requires the absolute lightness of a VO string, rather than the heaviness of a V-PON. A V-PON does not need to be heavier than a VO string. The construction is not built by a rightward movement of any "heavy" V-PON.

In addition to the three points above, one more fact supports our analysis: The right-edge element in an extraposition construction is focused (Quirk et al. 1985: 89), and so is a V-PON. Feng (2002) notes that a V-PON bears stress.

All of the above considerations support our light predicate raising analysis of V-PON constructions.

One might ask for the motivation of this light predicate raising. In the Strong Minimalist Thesis (Chomsky 2020, 2021; Moro & Roberts 2024, among others), movement does not need to check any features. Meaningless movement is possible to derive observed word orders (Cinque 2023).

There are various kinds of predicate raising. The raised predicate may show up at the left-peripheral (e.g. Huang 1993; Baltin 2006b), or at a position lower than a modal, stranding a functional head element (e.g. Zhang 2020). The raised light predicate raising in extraposition and the V-PON constructions discussed here also surfaces in a clause-internal position, but it strands a non-head element (i.e. a PP in the V-PON constructions).

6.3   The forms of certain prepositions in the pre- and post-verbal positions

This subsection is about certain prepositions that may not occur post-verbally and certain prepositions that may not occur preverbally. This is not a comprehensive investigation of the issue. Instead, it is just a few case study notes, to show the complexity of the issue.

First, the prepositions *cong* (從) 'from', *wei* (為) 'for', and *yu* (與) 'with' never occur post-verbally. This is shown in (46) through (48). The b-forms are V-PON constructions.

(46) a. 從阿富汗撤軍
          cong Afuhan   che   jun
          from Afghanistan withdraw army
      b. 撤軍（*從）阿富汗
          *che   jun (*cong) Afuhan*
          withdraw army   from   Afghanistan
          Both a and b: 'withdraw the army from Afghanistan'

(47) a. 為亞運會備戰
          wei Yayunhui   bei   zhan
          for the.Asian.Game prepare battle
      b. 備戰（*為）亞運會
          *bei   zhan (*wei) Yayunhui*
          prepare battle   for   the.Asian.Game
          Both a and b: 'prepare for the competitions in the Asian Game'

(48) a. 伊朗與沙國斷交。
          Yilang yu   Shaguo   duan jiao.
          Iran   with Kingdom.of.Saudi.Arabia break relation
      b. 伊朗斷交（*與）沙國。
          *Yilang duan jiao   (*yu) Shaguo.*
          Iran   break relation with Kingdom.of.Saudi.Arabia
          Both a and b: 'Iran broke diplomatic relation with the Kingdom of Saudi Arabia.'

The contrasts in (46) through (48) show that the form of a preposition varies depending on the syntactic context. I speculate that such prepositions obligatorily take a null form in the post-verbal positions in V-PON constructions, after the light predicate raising.

Elements surfacing as an overt form in one construction, but as a null form obligatorily in another construction, can be seen in other situations. For example, if the conjuncts denote elements of an open set, the coordinator is used as a non-exhaustive coordinator; and in English, such a conjunctive coordinator is null consistently. It occurs in the so-call "Unstructured Coordination" (Chomsky & Miller 1963; Chomsky 2013: 45); e.g., the underlined part in (49a), compared to the canonical coordination in (49b):

(49) a. *I met someone <u>young, happy, eager to go to college, tired of wasting time, …</u>*
      b. *I met someone <u>young, happy, eager to go to college, **and** tired of wasting time</u>.*

According to Büring & Hartmann (2015: 44), an example like (49a) "gives an impression of incompleteness, a notion of the sentence still being 'up-in-the-air.'" So, in addition to the items mentioned, there may be more unmentioned items. Both the overt coordinator *and* in (49b) and the null coordinator(s) in (49a) are conjunctive, rather than disjunctive or adversative. They mean the same, but occur in different syntactic contexts. They are variants of the same element in different syntactic environments (see Zhang 2023 for a syntactic analysis of examples like (49a–b).

Similarly, in each pair of the examples in (46) through (48), a certain preposition is overt in one syntactic context but is null in another syntactic context. The two forms can be variants of the same preposition in different syntactic contexts.

Second, among various uses of the preposition *yu* (於) 'at, from, for, to, …' (Lü 1999), the goal use is not seen in a preverbal position. In (50), *yu* is interpreted as a source preposition, and it occurs either post-verbally in (50a) or preverbally in (50b). In (51), *yu* is interpreted as a benefactive preposition, and it also occurs either post-verbally in (51a) (also see (13b)) or preverbally in (51b) (Lü 1999: 635–636). In (52), *yu* is interpreted as a goal preposition; however, in this reading, only the one in the post-verbal position, i.e. in (52a), is acceptable.

(50) a.   畢業於哈佛大學
           biye   yu   Hafo   Daxue
           graduate from Harvard University
      b.   於哈佛大學畢業
           yu   Hafo   Daxue   biye
           from Harvard University graduate
           Both a and b: 'graduated from Harvard University'

(51) a.   有利於我們
           you li   yu women
           have favor for we
      b.   於我們有利
           yu women you li
           for we   have favor
           Both a and b: 'be favorable to us'

(52) a.   效忠於國王
           xiao zhong (yu) guowang
           pay loyalty to king
      b.   {*於/向}國王效忠
           *{*yu/xiang} guowang xiao Zhong*
           to/to   king   pay loyalty
           Both a and b: 'pay loyalty to the King'

The position restriction on *yu* in its goal reading is associated with its semantics. In a post-syntax lexical insertion perspective, one may assume that in a preverbal position, to encode a goal reading, another preposition, *xiang* (向) 'to', which is unambiguous, having an exclusive goal reading, wins the competition against the polysemy *yu*, although one still needs to explain why such a competition occurs in this particular position (cf. Rainer et al. 2019).

The same tentative analysis applies to the preposition *dao* (到) in its goal reading: it may occur post-verbally, but never preverbally. In the well-formed (53a), the goal preposition *dao* may occur in a post-verbal position, whereas in (53b), *dao* in the goal reading may not occur in a preverbal position, although it can in its verbal reading, meaning 'go'. In the verbal reading, the construction is a serial verb construction. This example does not affect our generalization that *dao* with a goal reading does not occur preverbally. We do not discuss serial verb construction in this paper. In (53c), as in (52b), *xiang* blocks the polysemy *dao*, in achieving a goal reading.[7]

(53)   a.   投資（到）海外
      tou   zi   (dao) haiwai
      invest capital to   overseas
      'invest overseas'

    b.   #到海外投資
      #dao haiwai   tou   zi
      to   overseas invest capital
      'go abroad to invest capital'
      Not available: 'invest overseas'

    c.   向海外投資
      xiang haiwai   tou   zi
      to   overseas invest capital
      'invest overseas'

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7. (ia) and (ib) also show that *dao* and *yu* in the goal reading cannot occur preverbally, although I do not understand why *xiang* 'to' is also banned in (ib). See the next point for the absence of *xiang* in (ia).

(i)   a.   投身（到/於）教育事業
      tou   shen (dao/yu) jiaoyu-shiye
      devote body   to/to   education-career
      'devote oneself to an education career'

    b.   *{到/於/向}教育事業投身
      *{dao/yu/xiang} jiaoyu-shuye   tou   shen
      to/to/to   education-career devote body

Third, the preposition *xiang* 'to' may not occur post-verbally in the V-PON construction, as seen in (54a), but it may occur post-verbally in the PI construction, as seen in (54b) (also in (36b)), although it can also occur in the preverbal position in (52b) and (53c) above.

(54) a. *投資向海外
          **tou   zi   xiang haiwai*
          invest capital to   overseas
      b. 把資金投向了海外
          ba zijin   tou-xiang-le   haiwai
          BA capital invest-to-PRF oversees
          'invest overseas'

Descriptively, the same expression with the same reading may show up in one syntactic context, but not in another syntactic context. A somewhat analogical example is the following. In a comparative context, the comparative form of a monosyllabic adjective must be in the *-er* form, rather than in the *more* form in English; however, in a metalinguistic comparative context, the opposite pattern is seen (Bresnan 1973: 275; see a formal analysis of metalinguistic comparatives in Giannakidou & Yoon 2011, although they do not discuss this morphological contrast). In (55), *taller* is used, instead of *more tall*; however, in (56), *more tall* is used, instead of *taller*. This also shows that the same expression with the same reading may show up in one syntactic context, but not in another syntactic context.

(55) a. *I am taller than you.*
      b. **I am more tall than you.*

(56) a. *I am more tall than skinny.*
      b. **I am taller than skinny.*   (cf. Haiman 1988: 303)

In Mandarin, PI and V-PON constructions are syntactically different. In a post-verbal position, *xiang* is allowed in the former, but not in the latter.

I speculate that the constraints on all of the prepositions discussed here are restrictions on the post-syntax lexical insertion. The form of a certain element varies depending on the syntactic context. Obviously, the empirical issues reported here need to be studied in a different project.

6.4 Against the light verb analysis of an implicit preposition

After presenting my proposed analysis of the V-PON construction, in this subsection, I argue against one more analysis of the construction. In Feng (2002: 519) and Tsai (2017), the relation between a preposition and a V-PON is that between

a functional head (the light verb v) and its Spec (see box ① in (57b)); the VO string in the construction is analyzed as a complex verb, it moves from V to this functional head, and then the head complex moves further to a higher head, landing to the left of the V-PON (see (58b)). In this analysis, the canonical (57a) has the structure in (57b), and the V-PON construction in (58a) has the structure in (58b) (based on Tsai 2017: (24)):

(57)   a.   他們從阿富汗撤軍。
            Tamen cong Afuhan   che   jun.
            they   from Afghanistan withdraw army
            'They withdrew the army from Afghanistan.'

       b.
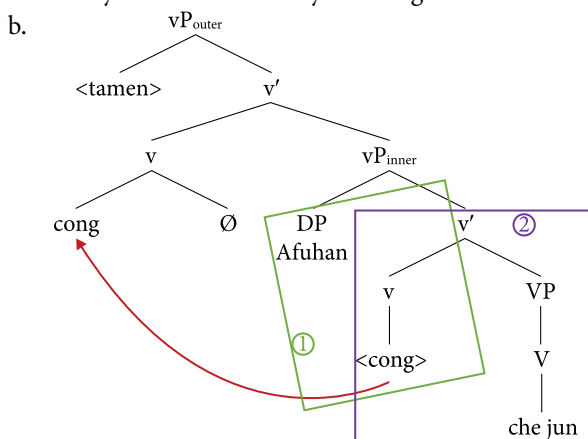
(58)   a.   他們撤軍阿富汗。
            Tamen che   jun   Afuhan.
            they   withdraw army Afghanistan
            'They withdrew the army from Afghanistan.'

       b.
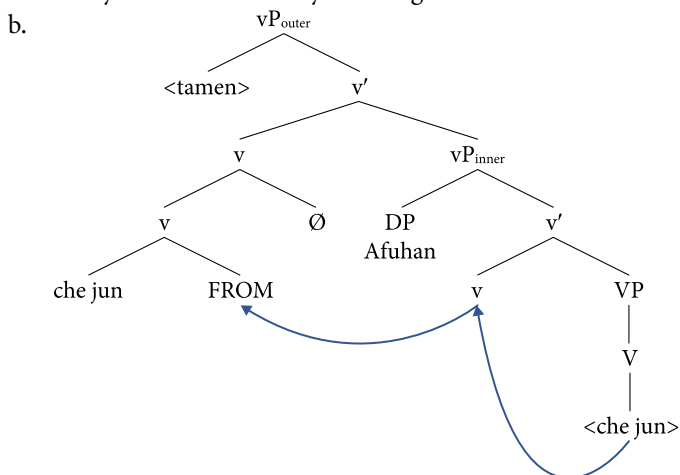
The following problems can be found in this analysis.

First, in this analysis of the V-PON construction, the (implicit) preposition is analyzed as a v element, and it does not form a constituent with a V-PON. In the canonical structure in (57b), the inner v and its Spec do not form a constituent (box ①). But a V-PON must be correlated with a pre-verbal [P + NP] string (see §3), and this string is indeed a syntactic constituent. This can be seen in the cleft construction in (59a). Also, the question in (59b) can be answered by a canonical PP, composed of the preposition *cong* 'from' and its object *Afuhan* 'Afghanistan'.

(59) a. 他們是從阿富汗不是從伊拉克撤軍的。
          Tamen shi cong Afuhan   bushi cong Yilake che   jun de.
          they be from Afghanistan not from Iraq withdraw army PRT
          'It was from Afghanistan, rather than from Iraq, where they withdrew their army.'
      b. Q: 他們從哪裡撤軍?
          Q: *Tamen cong nali   che   jun?*
              they   from where withdraw army
              'From where did they withdraw the army?'
          A: 從阿富汗。
          A: *Cong Afuhan.*
              from Afghanistan.
              'From Afghanistan.'

Second, the inner v, which can be realized by a preposition, and the VP form a constituent in the analysis (the inner v' in (57b), box ②), but there is no evidence for this constituency. No semantic relation is seen between a preposition alone and a VP, excluding the object of the preposition (e.g. *Afuhan* in (57)). The combination of these two elements in their base-positions is not justified.[8]

Third, the VO string is treated as a verb, but it does not have the property of a verb (see §4.1). In Feng (2002: 519), in a V-PON construction, the theme and the verb undergo reanalysis, forming a complex verb, and then the complex undergoes a head movement, landing to the left of a V-PON. However, after the assumed reanalysis, the formed complex verb should be able to take an aspect marker. In (60a), the verb *lai* 'come' and the preposition *dao* 'to' are assumed to

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8. One anonymous reviewer asks me to "[c]onsider directional verbs. They do encode an implicit direction therein. Thus, directions and verbs can be semantically related." A direction verb such as *lai* 'come' and *qu* 'go' indeed does have a direction meaning, but such a verb alone, without a locative (e.g. *Beijing* 'Beijing'), is not a directional VP, which should contain a locative, as well as the directional verb. Thus, my statement on the relation between a VP and a preposition in the text is not challenged.

have undergone a reanalysis (Li 1990: 60). The perfective aspect marker *le* follows the cluster *lai-dao* 'come-to'. But the VO string with a V-PON cannot have any aspect marker, as seen in (60b) (see §4.1).

(60) a.   他來到了我家。
            Ta lai-dao-le   wo jia.
            he come-to-PRF I   house
            'He came to my house.'
      b.   美國撤軍（＊了）阿富汗。
            Meiguo che   jun(-le)   Afuhan.*
            USA   withdraw army-PRF Afghanistan
            'The USA withdrew the army from Afghanistan.'

Moreover, we cannot justify reanalysis as an operation beyond external and internal merge, the only two operations in syntax (see Baltin & Postal 1996, among others). Item (60a) is built by the movement that derives a PI construction (§4.2).

Thus, the structure in (57b) cannot be a reliable step in the derivation of a V-PON construction. I therefore do not adopt this analysis, in which an (implicit) preposition is a functional head and a V-PON is its Spec.

In this section, I have argued that in a V-PON construction, a transitive VP in its minimal form (i.e., both the verb and its object are monomorphemic) moves to the left of an adverbial PP. Movement of a minimal form is also seen in PI and the NI that derives the O-PON construction, as reported in §4.2. After the movement, the preposition can be deleted in general, but must be in a null form in certain cases. I have also tentatively discussed how an obligatorily null preposition occurs. Finally, I have argued that the relation between a possible preposition and a V-PON is not that between a functional head and its Spec, and the VO string is not a head element created by reanalysis.

7.   Conclusions

This paper has compared two kinds of post-object nominals: one is semantically related to the object to its left and the other is semantically related to the whole VO string to its left, showing that they are syntactically different. Moreover, the paper has compared preverbal PP adverbials and postverbal PP adverbials (which may have a null P), showing that they are derivationally related. Furthermore, the paper has also compared two kinds of post-verbal nominals: NOCs and the post-VO adverbial nominals, showing that only the latter is derivationally related to a preverbal PP.

The major descriptive contributions made in this paper include the following. (A) A V-PON must correlate with a preverbal PP. (B) Unlike other kinds of post-verbal nominals, including NCOs, a V-PON cannot be deleted. (C) Unlike a verb, the VO string rejects an aspect marker, and thus it is a VP, instead of a verb. (D) Unlike other VPs, each element of the VO string in a V-PON construction must be monomorphemic, and thus the string is a transitive VP in its minimal length.

The claims made in this paper include the following. (A) The derivation of a V-PON construction is similar to that of extraposition constructions in other languages; i.e., Larson (1989) and Barbiers's (1995) light predicate raising. This means that V-PON is in a preverbal PP, but it surfaces at a post-verbal position after the VP has moved leftward and the P gets deleted. (B) There are two language-specific restrictions on light predicate raising in Mandarin. First, the predicate must be headed by a transitive verb. Thus, a V-PON is different from an NCO. Second, the transitive predicate must be in its minimal length; i.e., both the verb and its object must be monomorphemic.

The main theoretical contribution of this paper is that certain types of merge are sensitive to the form economy: to derive a V-PON construction, as well as various extraposition and heavy XP shift constructions, it is a light element that undergoes an internal merge. The criterion for the lightness is language-specific. In Mandarin, a transitive VP that is composed of a monomorphemic verb and a monomorphemic object is light, and only such a VP can be fronted to build a V-PON construction. The restriction that only a monomorphemic noun or preposition can be merged with a monomorphemic verb is also observed in other constructions in Mandarin. Thus, the form economy can be one of the general rules in syntactic operations.

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Abbreviations

BA	causative	MOD	modification
CL	classifier	PRF	perfective
EXP	experiential	PRT	sentence-final particle

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