The order of OVX and the argument-adjunct distinction

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Abstract. As for the order of verb (V), object (O), and oblique (X), Dryer (with Gensler) (2013) finds the asymmetry between VO and OV languages in terms of the position of X: VO languages are almost exclusively VOX, and OV languages are of all three types (XOV, OXV, and OVX). Hawkins (2008) argues that "[t]he OVX languages should be more head-initial and have head ordering correlations more like those of VO" (e.g., preposition: OVX 33%, VO 86%). However, we claim that high percentages of OVX languages have head-final orders unlike VO languages in complement-head orders (e.g., postposition: OVX 67%, VO 14%). We also claim that OVX languages have more head-initial orders than XOV and OXV languages in head-adjunct orders (e.g., Noun-Adjective: OVX 100%, XOV 56%, OXV 67%). We propose the universal tendency to complement-head-adjunct order.

Keywords. word order; oblique; typology; complement; adjunct

1. Introduction. The order of verbs (V) and their objects (O) has been of particular interest in the literature. However, the order of obliques (X) with respect to verbs and objects has received relatively little attention. Dryer (with Gensler) (2013) points out the asymmetry between VO and OV languages with respect to the position of obliques: while VO languages are overwhelmingly VOX [210 languages] (cf. XVO [3], VXO [0]), all three types of OV languages are widely attested (XOV [48], OXV [27], OVX [45]).

To explain the distribution of the word order patterns of V, O and X, Hawkins (2008) proposes three factors; V & O Adjacency, O & X on Same Side, and O before X. In Kuwana and Tokizaki (2023), we argue that the possible and impossible orders of V, O and X can be explained by domain size for constituent recognition: the widely attested orders, VOX [210], XOV [48], OXV [27], and OVX [45], need a smaller domain size for constituent recognition than the (almost) unattested orders, XVO [3] and VXO [0].

Despite the studies by Hawkins (2008) and Kuwana and Tokizaki (2023), questions remain such as why X follows V only in OVX languages. In this regard, Hawkins (2008) observes that OVX languages are more head-initial than XOV and OXV languages, which will be reviewed in section 3 below.

In this paper, we will argue that the complement-adjunct distinction is crucial for word orders.[1] Analyzing the data on word orders in Dryer (2013a, c, d, e, f, g, h) and Dryer (with Gensler) (2013), we will point out that complements tend to precede their heads while adjuncts tend to follow their heads. We will argue for the universal tendency to complement-head-adjunct order. We will also consider why the world's languages show the complement-head-

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[1] In the following discussion, we use the term 'complement' instead of 'argument' to examine not only pairs such as V (head) and O (argument) but also those such as affix (head) and stem (complement).

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adjunct tendency, discussing heaviness of dependents and obligatoriness or restrictiveness of dependents.[2]

2. The order of verb, object and oblique in the world's languages. Dryer (with Gensler) (2013) illustrates the orders of V, O and X with the examples in (1), where the number in brackets shows the number of languages in the world.

(1)   a.   VOX [210]: English
          Mary [v opened] [o the door] [x with a key].
    b.   XVO [3]: Mandarin (Chinese, China)
          tāmen [x *zài fángzi-hòumian*] [v *xiūli*] [o *diànshìjī*]
          they   at house-behind   repair   television
          'They repair televisions behind their house.'
    c.   VXO [0]
    d.   XOV [48]: Slave (Athapaskan; Canada)
          t'eere [x *denǫ gha*] [o *ʔerákeeʔee*] [v *wihsį*]
          girl   REFL.mother for   parka   3.made
          'The girl made a parka for her mother.'
    e.   OXV [27]: Nagatman (Yale; Papua New Guinea)
          na [o *mo me*] [x *ke na*] [v *huhui-në-taya*]
          and   fish OBJ   these with   look.for-1.SUJ-3PL.OBJ
          'And we look for fish with these.'
    f.   OVX [45]: Kairiru (Oceanic; Papua New Guinea)
          ei [o *porri tamiok*] [v *a-pik*] [x *gege-i nat nai*]
          3SG   axe   3SG-take   from-3SG child   that
          'He/she took the axe from that child.'

Dryer (with Gensler) (2013) also discusses the areal distribution of the relevant types of language. While XVO languages and OVX languages show stronger areality (the former is restricted to China and the latter to West Africa, Australia and South America), the others are fairly widely distributed as seen in Figure 1 below:

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[2] We use the term 'dependents' to refer to both complements and adjuncts.
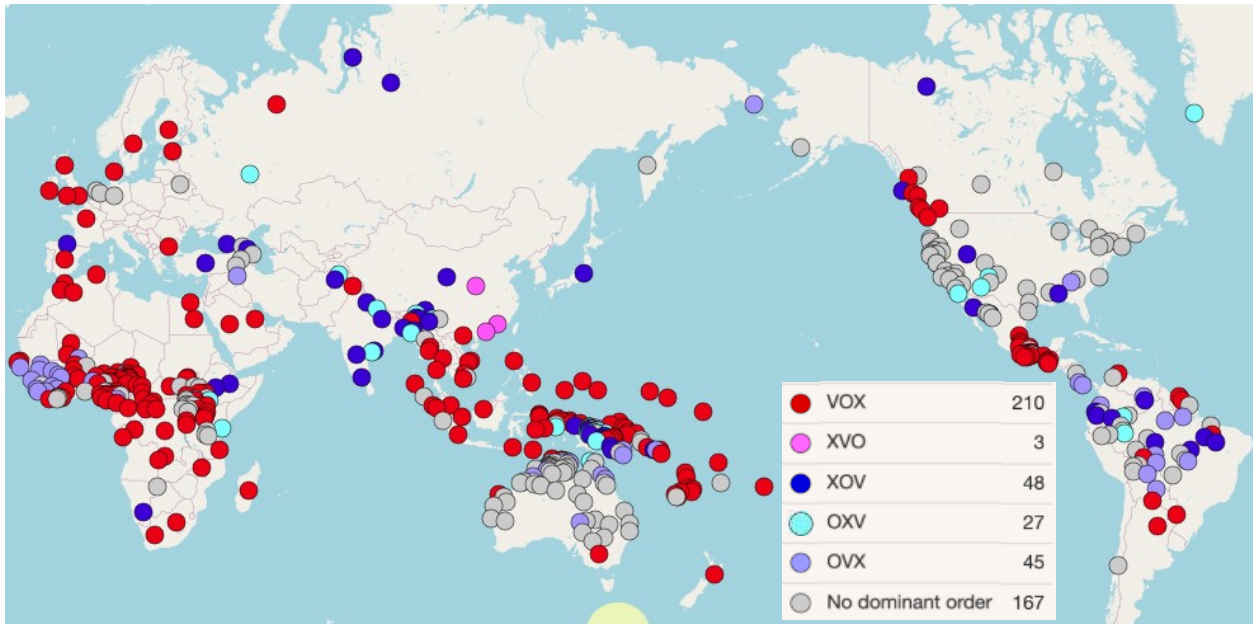
Figure 1. Areal distribution of VO and OV languages in terms of X (Dryer (with Gensler) 2013)

3. Is OVX more head-initial than XOV and OXV? Hawkins (2008: 183) argues that "in OVX languages we should see more head-initial XPs" and that "[t]he OVX languages should be more head-initial and have head ordering correlations more like those of VO." Table 1 below shows the percentages of head-final order (blue) vs. head-initial order (red), namely, NP-Postposition vs. Preposition-NP, Genitive-Noun vs. Noun-Genitive, Relative clause-Noun vs. Noun-Relative clause, Adjective-Noun vs. Noun-Adjective, Stem-Suffix vs. Prefix-Stem (including no affix).

	PostP	PreP	GN	NG	RelN	NRel	AN	NA	Suf	Pref	No Af
XOV	97% (32)	3% (1)	97% (30)	3% (1)	57% (13)	43% (10)	44% (16)	56% (20)	73% (27)	3% (1)	24% (9)
OXV	94% (15)	6% (1)	89% (16)	11% (2)	36% (4)	64% (7)	33% (6)	67% (12)	88% (15)	0% (0)	12% (2)
OVX	67% (14)	**33%** (7)	69% (18)	**31%** (8)	0% (0)	**100%** (17)	0% (0)	**100%** (23)	48% (10)	**5%** (1)	**48%** (10)
VO	14% (22)	86% (134)	27% (45)	73% (124)	3% (3)	97% (116)	29% (51)	71% (122)	27% (42)	16% (25)	58% (91)

Table 1. Order of O, X & V and head orderings (Hawkins 2008: 183–184) (blue: head-final, red: head-initial)

The percentage of prepositions in OVX languages is 33% (shown in bold in Table 1), which is more than that in XOV (3%) and that in OXV (6%), and that percentage of OVX (33%) is somewhat close to that in VO (86%).[3] Similarly, the percentage of Noun-Genitive order (NG) in OVX languages is 31%, which is more than that in XOV (3%) and that in OXV (11%), and that

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[3] Our analysis of the data in Dryer (with Gensler) (2013) and Dryer (2013b) shows that OVX languages have higher percentages of no case-marking (54.3 %) than XOV (22.2 %) and OXV (18.2 %) languages. For case marking of objects, see Tokizaki and Kuwana (2024).

percentage is somewhat close to that in VO (73%). The percentages of Noun-Relative clause order and Noun-Adjective order in OVX languages is 100%, which is more than those in XOV (43% and 56%) and those in OXV (64% and 67%), outnumbering those in VO (97% and 71%). The percentage of prefixes in OVX languages is 5%, which is more than that in XOV (3%) and that in OXV (0%), and that percentage is somewhat close to that in VO (16%).

Looking at these percentages, we agree with Hawkins (2008) in that OVX languages are more head-initial than XOV and OXV languages. However, we notice that the percentages of some head-initial orders (preposition 33%, Noun-Genitive 31%, and prefix-stem 5%) are closer to those of XOV and OXV languages (preposition 3% & 6%, Noun-Genitive 3% &11%, and prefix-stem 3% & 0%) than to those of VO languages (preposition 86%, Noun-Genitive 73%, and prefix-stem 16%). In other words, OVX languages are still more of head-final than head-initial in these orders.

4. Complement, head and adjunct. Let us look at the same data focusing on the head-final orders.

	PostP	PreP	GN	NG	RelN	NRel	AN	NA	Suf	Pref	No Af
XOV	97% (32)	3% (1)	97% (30)	3% (1)	57% (13)	43% (10)	44% (16)	56% (20)	73% (27)	3% (1)	24% (9)
OXV	94% (15)	6% (1)	89% (16)	11% (2)	36% (4)	64% (7)	33% (6)	67% (12)	88% (15)	0% (0)	12% (2)
OVX	**67%** (14)	33% (7)	**69%** (18)	31% (8)	0% (0)	100% (17)	0% (0)	100% (23)	**48%** (10)	5% (1)	48% (10)
VO	14% (22)	86% (134)	27% (45)	73% (124)	3% (3)	97% (116)	29% (51)	71% (122)	27% (42)	16% (25)	58% (91)

Table 2. Order of O, X & V and head orderings (Hawkins 2008: 183–184) (blue: head-final, red: head-initial)

High percentages of OVX languages have head-final orders in postposition (67%), Genitive-Noun (69%) and stem-suffix (48%). These high percentages contrast with the fact that there is no OVX languages with the order Rel-N (0%) and A-N (0%)).

Two questions arise here. (i) Why do OVX languages have more head-initial orders than XOV and OXV languages? (ii) Why do high percentages of OVX languages have some head-final orders: postposition (67%), Genitive-Noun (69%) and stem-suffix (48%)?

A key to answering these questions is to distinguish head-complement pairs from head-adjunct pairs. In the five pairs in Table 2, NP-postposition, Genitive-Noun and Stem-Suffix (assuming that suffix as well is the head of the word) are complement-head orders. The other two pairs, Noun-Relative clause and Noun-Adjective are head-adjunct pairs.

Assuming the distinction between complement and adjunct, we can generalize that high percentages of OVX languages have head-final orders in complement-head constituents (postposition (67%), Genitive-Noun (69%) and stem-suffix (48%)), but not in adjunct-head constituents (Relative clause-Noun (0%) and Adjective-Noun (0%)).

As another order of head and adjunct, we update Table 1 and Table 2 by using the data in Dryer (2013a, c, d, e, f, g) and Dryer (with Gensler) and by adding the order of degree word and adjective (Dryer 2013h) to Table 1 and Table 2. Below, we show the three head-complement

pairs in Table 3 and the three head-adjunct pairs in Table 4. The items with an asterisk in the tables indicate that they include no affix (Pref*), no dominant order (NG*, PreP*, ADeg*, NA*), and Mixed/Correlative/Adjoined relatives (NRel*).

	Suf	Pref*	GN	NG*	PostP	PreP*
XOV	**71.8%** **(28)**	28.2% (11)	**97.5%** **(39)**	2.5% (1)	**97.6%** **(40)**	2.4% (1)
OXV	**71.4%** **(15)**	28.6% (6)	**90.9%** **(20)**	9.1% (2)	**95.0%** **(19)**	5.0% (1)
OVX	**41.2%** **(14)**	58.8% (20)	**77.8%** **(35)**	22.2% (10)	**74.4%** **(29)**	25.6% (10)
VO	**26.9%** **(43)**	73.1% (117)	**20.9%** **(41)**	79.1% (155)	**6.1%** **(12)**	93.9% (184)
Total	**(100)**	(154)	**(135)**	(168)	**(100)**	(196)

Table 3. Three head-complement pairs

	DegA	*ADeg*	**AN**	NA*	**RelN**	NRel*
XOV	*66.7%* *(14)*	*33.3%* *(7)*	**44.4%** **(20)**	55.6% (25)	**50.0%** **(13)**	50.0% (13)
OXV	*46.7%* *(7)*	*53.3%* *(8)*	**25.0%** **(6)**	75.0% (18)	**33.3%** **(6)**	66.7% (12)
OVX	*7.1%* *(1)*	*92.9%* *(13)*	**0%** **(0)**	100% (41)	**0%** **(0)**	100% (29)
VO	*31.2%* *(30)*	*68.8%* *(66)*	**17.2%** **(34)**	82.8% (164)	**0%** **(0)**	100% (170)
Total	*(52)*	*(94)*	**(60)**	(248)	**(19)**	(224)

Table 4. Three head-adjunct pairs

Table 3 shows that OVX languages tend to have head-final order in head-complement pairs (suffix 41.2%, Genitive-Noun 77.8% and NP-Postposition 74.4%).[4] Table 4 shows that OVX languages tend to have head-initial order in head-adjunct pairs (Adjective-Degree word 92.9%, Noun-Adjective 100%, and Noun-Relative 100%). Thus, we can conclude that OVX languages tend to have the complement-head-adjunct order, which corresponds to the order of the object-verb-adjunct (OVX) order.

Then, the answers to the two questions above are the followings. (i) Why do OVX languages have more head-initial orders than XOV and OXV languages? Answer: Because OVX languages, which have the complement-<u>head-adjunct</u> order as their basic pattern, tend to put the adjunct after the head to make head-adjunct order. Also, OVX languages are more likely to put complements (other than objects) after the head to make head-complement order than XOV and OXV, which have the strict head-final order.

(ii) Why do high percentages of OVX languages have some head-final orders: suffix (41.2%), genitive-noun (77.8%) and postposition (74.4%)? Answer: Because OVX languages,

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[4] The percentage of Stem-Suffix order is 41.2%, which is lower than that of Prefix-Stem order (58.8%). We need to look for the reason why affixes are more likely to precede the stem in OVX languages.

which have the complement-head-adjunct order as their basic pattern, tend to put the complement before the head to make the head-final order.

5. Complement-adjunct distinction

5.1. C-H & H-A TENDENCY. We have argued that the complement-adjunct distinction is crucial for word orders in OVX languages. In this section, we consider the universal nature of the complement-adjunct distinction.

First, let us compare the order of genitive and noun with that of adjective and noun in the world's languages. Dryer (2013e) shows that the number of languages with the order of G-N is 685 (59.4%) and that of N-G is 468 (40.6%). Dryer (2013f) shows that the number of languages with the order of A-N is 373 (29.8%) and N-A is 879 (70.2%). These facts suggest that genitives are more likely to precede the head noun than adjectives do [G-N > A-N] (685 (59.4%) vs. 373 (29.8%)), and that adjectives are more likely to follow the head noun than genitives do [N-A > N-G] (879 (70.2%) vs. 468 (40.6%)).

Second, if we compare the order of genitive and noun with that of relative clause and noun. Dryer (2013g) shows that the number of languages with the order of Rel-N is 141 (19.6%) and that of N-Rel is 579 (80.4%). We find that genitives are more likely to precede the head noun than relative clauses do [G-N > Rel-N] (685 (59.4%) vs. 141 (19.6%)), and that relative clauses are more likely to follow the head nouns than genitives do [N-Rel > N-G] (579 (80.4%) vs. 468 (40.6%)).

Third, let us compare the order of object and verb with that of oblique and verb. According to Dryer (2013c), the number of languages with the order of O-V is 712 (50.2%) and that of V-O is 705 (49.8%). Our analysis of the data in Dryer (with Gensler) (2013) shows that the number of languages with the order of X-V is 78 (23.4%) and that of V-X is 255 (76.6%).[5] Objects are more likely to precede verbs than obliques do [O-V > X-V] (712 (50.2%) vs. 78 (23.4%)), and obliques are more likely to follow verbs than objects do [V-X > V-O] (255 (76.6%) vs. 705 (49.8%)).

Finally, let us compare the order of all the complements and heads in Table 3 with that of all the adjuncts and heads in Table 4. We add up the numbers of each word order type; the total number of languages with complement-head order is 1,791 (61.3%) and that with head-complement order is 1,131 (38.7%).[6] For adjuncts, we add up the numbers of each word order type; the total number of languages with adjunct-head order is 741 (31.0%) and that with head-adjunct order is 1,650 (69.0%).[7] We find that complements are more likely to precede their heads than adjuncts do [C-H > A-H] (1,791 (61.3%) vs. 741 (31.0%)), and that adjuncts are more likely to follow their heads than complements do [H-A > H-C] (1,650 (69.0%) vs. 1,131 (38.7%)). The results of each of the four comparisons above are examined by means of a chi-square test, and prove to be statistically significant (p < 0.01).

5.2. OVX AS COMPLEMENT-HEAD-ADJUNCT (C-H-A). We have discussed the universal tendency to complement-head-adjunct order. Then, OVX languages, which apparently have an exceptional

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[5] X-V: XVO 3 + XOV 48 + OXV 27 = 78, 78/333 = 23.4%; V-X: VOX 210 + OVX 45 = 255, 255/333 = 76.6%
[6] C-H: suffix 529 + G-N 685 + postposition 577 = 1791, 1791/2922 = 61.3%; H-C: prefix 152 + N-G 468 + preposition 511 = 1131, 1131/2922 = 38.7%
[7] A-H: Deg-A 227 + A-N 373 + Rel-N 141 = 741, 741/2391 = 31.0%; H-A: A-Deg 192 + N-A 879 + N-Rel 579 = 1650, 1650/2391 = 69.0%

word order, are in fact typical languages that manifest this tendency. In OVX languages, complements are likely to precede the head (C-H):

(2) a. O-V (100%)   'bird-watch'
    b. NP-Postposition (74.4%)   '(from) now on'
    c. Genitive-Noun (77.8%)   'Mary's hat'
    d. Stem-Suffix (41.2%)   'dog-s'

and adjuncts are likely to follow the head (H-A):

(3) a. V-X (100%)   'go to school'
    b. Adjective-Degree word (92.9%)   'large enough'
    c. N-Adjective (100%)   'stars visible'

Here are the examples from Apalaí (Cariban; Brazil):

(4) a. O-V
        mame [$_O$ *tamy matary*] [$_V$ *epekaty-ase*]
        then   tobacco   1+buy-RP
        'Then I bought tobacco.'   (Koehn and Koehn 1986: 33)
    b. NP-Postposition
        [$_{NP}$ *u-tupi*]   [$_P$ *pona*] *ropa*   *yto-V̄ko*   *ase*
        1-field+POSSN   to   again   go-CONT   1+be+PRES
        'I'm going back to my field.'   (Koehn and Koehn 1986: 99)
    c. Genitive-Noun
        [$_G$ *nohpo*] [$_N$ *0-kyry-ry*]
          woman   3-thing-POSSN
        'the woman's possession'   (Koehn and Koehn 1986: 85)
    d. Stem-Suffix
        [$_{ST}$ *i-kyry*]   [$_{SUF}$ *-ry*]
          3-thing   -POSSN
        'her/his posession'   (Koehn and Koehn 1986: 85)

(5) a. V-X
        mame [$_V$ *oepy-ase*] [$_X$ *ituh-taka*]
        then   1+come-RP   forest-to
        'Then I came to the woods.'   (Koehn and Koehn 1986: 37)
    b. Adjective-Degree word
        [$_A$ *kure*]   [$_{DEG}$ *nymuyry*]
          good   genuine
        'genuinely good'   (Koehn and Koehn 1986: 111)
    c. N-Adjective
        [$_N$ *y-kaparu-nu*]   [$_A$ *nymyry*]   *apoi-ko*   *j-epe*
        1-club-POSSN   genuine   grab-IMP   1-frend+POSSN
        'Grab my genuine club, friend.'   (Koehn and Koehn 1986: 87)

In OVX languages, complements are likely to precede the head (C-H) and adjuncts are likely to follow the head (H-A).

5.3. *ADJUNCT-HEAD-COMPLEMENT (*A-H-C). If the tendency to complement-head-adjunct exists, we expect that there are few languages with the adjunct-head-complement order in the world.

This expectation is born out. If we analyze the data in Dryer (2013e) and Dryer (2013f), we find as few as 65 languages (6.6%) with Adjective-Noun-Genitive order out of 981 languages, as shown in Table 5.

	N-Adj	Adj-N
N-G	342 (34.9%) N-G/Adj [H-C/A]	**65 (6.6%)** **Adj-N-G [A-H-C]**
G-N	342 (34.9%) G-N-Adj [C-H-A]	232 (23.6%) G/Adj-N [C/A-H]

Table 5. The number of languages with the order of genitive/adjective and noun (Dryer (2013e, f))

This A-N-G order makes a sharp contrast with the other orders, N-G/A [342] (34.9%), G-N-A [342] (34.9%) and G/A-N 232 (23.6%).

Similarly, analyzing the data of Dryer (2013e) and Dryer (2013g), we find only 2 languages (Amis (East Formosan; Taiwan) and Tigré (Semitic; Eritrea)) with the Relative-Noun-Genitive order out of 619 languages (0.3%).

	N-Rel	Rel-N
N-G	328 (53.0%) N-G/Rel [H-C/A]	**2 (0.3%)** **Rel-N-G [A-H-C]**
G-N	161 (26.0%) G-N-Rel [C-H-A]	128 (20.7%) G/Rel-N [C/A-H]

Table 6. The number of languages with the order of genitive/relative and noun (Dryer (2013e, g))

The percentage of this order contrasts with that of the other orders, N-G/Rel [328] (53.0%), G-N-Rel [161] (26.0%) and G/Rel-N [128] (20.7%).

As another example of *Adjunct-Head-Complement, we can also examine the combination of V-O order and V-X order if we use the data of Dryer (2013c) and Dryer (with Gensler) (2013).[8]

	V-X	X-V
V-O	209 (63.0%) V-O/X [H-C/A]	**3 (0.9%)** **X-V-O [A-H-C]**
O-V	45 (13.6%) O-V-X [C-H-A]	75 (22.6%) O/X-V [C/A-H]

Table 7. The number of languages with the order of object/oblique and verb (Dryer (2013c) and Dryer (with Gensler) (2013))

Again, the number of languages with *Adjunct-Head-Complement order (XVO) is only three: Cantonese, Hakka, and Mandarin (Chinese).[9]

So far, we have investigated the three combinations of head and complement/adjunct. The result shows that the Adjunct-Head-Complement order (*Adjective-Noun-Genitive, *Relative clause-Noun-Genitive and *X-V-O) is rare. This fact supports the universal tendency to the order Complement-Head-Adjunct.

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[8] The number of languages with O-V and X-V [75] is obtained by adding XOV [48] to OXV [27].

[9] These three languages can be analyzed as VOVO rather than XVO. See Tokizaki and Kuwana (2024).

5.4. WHY *ADJUNCT-HEAD-COMPLEMENT?

5.4.1. HEAVINESS OF DEPENDENTS. In this section, we would like to consider the reason why com-plements are likely to precede the head while adjuncts are likely to follow the head. We will discuss two possible explanations: (i) heaviness of dependents and (ii) obligatoriness or restrictiveness of dependents.

First, let us consider the heaviness of dependents. Adjuncts are generally more complex and heavier than complements. Adjuncts typically have adpositions while complements tend to have no adpositions especially in VO languages. For example, in English, the object of a verb has no adposition while the adjunct appears with a preposition.

(6) a. Mary put [$_O$ the book] [$_X$ on the table]
     b. Susan cleaned [$_O$ the floor] [$_X$ with a mop]

English puts both objects and adjuncts after the verb, but Hixkaryana (Cariban; Brazil) puts objects without adpositions before the verb and adjuncts with adposition after the verb (cf. (1f) Kairiru).

(7) [$_O$ *kana*]   [$_V$ *yokono*]   [$_X$ *maryeya   ke*]
        fish   he.cut.it   knife   with
     'He cut the fish with a knife.'   (Derbyshire 1979: 39)

Tokizaki and Kuwana (2009) propose a constraint on word order *Heavy-Head-Light, which prohibits a heavy dependent from preceding the head if a light dependent follows the head. The tendency to complement-head-adjunct matches the order Light-Head-Heavy. There seems to be parallelism between *Heavy-Head-Light and *Adjunct-Head-Complement.

However, this approach has the problem in the cases where complements are complex and where adjuncts are simplex. For example, objects may have postpositions in head-final languages such as Japanese (e.g., *sushi-o* 'sushi-Acc'). Adjuncts such as adjectives and degree words may well be simplex forms (e.g. <u>white</u> *chocolate*, <u>very</u> *tall*, ...). See Tokizaki and Kuwana (2009) for *Heavy-Head-Light.

5.4.2. OBLIGATORINESS. The other possible explanation of the tendency to Complement-Head-Adjunct is the obligatoriness of complements and the optionality of adjuncts. In general, com-plements are obligatory in the sense that complements cannot be deleted, as shown in (8).

(8) a. *(book)-s   * (Stem)-Suffix
     b. I like *(those children's) mother.   * (G)-N
     c. I went to *(New York).   P *(N)

Adjuncts are optional and can be deleted as shown in (9).

(9) a. He is (very) tall.   (Deg) A
     b. I love (white) snow.   (A) N
     c. The books(, which are on sale,) look interesting.   N (Rel)

There seems to be a correlation between obligatoriness and restrictiveness of dependents. Oblig-atory constituents tend to be restrictive while optional constituents tend to be non-restrictive. In some languages such as English, restrictive constituents precede the head while non-restrictive constituents follow the head (Restrictive-Head-NonRestrictive). For example, the adjective *visible* preceding the head noun *stars* in (10a) is obligatory and restrictive, while the adjective *visible* following the head noun *stars* in (10b) is optional and non-restrictive.

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(10) a. The number of *(visible) stars is shrinking. (the subset of stars that are visible)
       b. Count the number of stars (visible). (the stars, which are visible)

If we assume that complements are obligatory and restrictive, we expect that they tend to precede the head. If we assume that adjuncts are optional and non-restrictive, we expect that they tend to follow the head. Then, we can explain the tendency to Complement-Head-Adjunct.[10]

6. Conclusion. We have argued that OVX languages have more head-initial orders in head-adjunct pairs than XOV and OXV languages because OVX languages have complement-head-adjunct orders. High percentages of OVX languages have head-final orders in complement-head pairs (suffix, genitive-noun and postposition) because OVX languages have complement-head-adjunct orders. We have also argued that complements are more likely to precede the head than adjuncts do in the world's languages.

We would like to mention some consequences of our analysis. Dryer (1992) excludes the order of head and adjuncts such as adjectives from correlation pairs with VO/OV. However, we can deal with head-adjunct orders together with head-complement orders in a general scale of head-dependent orders (Table 3 and Table 4).

Although we still have to explain the relatively high percentage of head-initial orders in the complements in OVX languages, we hope that our analysis sheds some light on the importance of the distinction between complements and adjuncts, their obligatoriness and optionality, and word orders in the world's languages.

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[10] See Cinque (2010, Ch. 2) for the contrast between Germanic and Romance with respect to prenominal and postnominal adjectives. Romance languages might not observe the tendency Restrictive-Head-NonRestrictive (cf. Demonte (2008)). We suppose that the iambic prosody (WS) of Romance affects the word order, but we will leave this matter for our future research.

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