

The Meaning of Coordination

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1 Introduction

- In modern semantic theory, the apparently simple word ‘and’ turns out to be highly problematic and controversial; see for example Lang (1984). Even within recent formal semantics, there is a stark divide between those who consider ‘and’ to have a primarily intersective or Boolean meaning, and those who consider it to have a primarily collective or non-Boolean meaning (see Champollion 2016).
- As with all linguistic analysis, it is instructive to compare and contrast the insights of different linguistic theories and traditions. The theory of the meaning of *ca* ‘and’ (or *cārtha*) in the ancient Indian grammatical tradition has not been widely investigated, nor compared in detail with modern linguistic approaches. The only exception is Roodbergen (1974).

AIMS OF THIS TALK:

- We draw out and detail a range of approaches to the meaning of coordination found within the ancient Indian grammatical tradition.
- We focus on how Patañjali and later scholars like Kaiyaṭa, Bhaṭṭoji and Nāgeśa individually understood the meaning of *ca*, and the more extensive set of nine meanings of *ca* given in the *Gaṇaratnamahodadhi*.

2 Pāṇini

- In Pāṇini (ca. 400 B.C.), the key rule is Aṣṭ. 2.2.29 *cārthe dvandvaḥ* “(when two or more words ending in a case-affix are semantically related to each other (*samartha*)) and stand in a relation expressible by ‘and’, they are made into a compound; and the compound so formed is called *dvandva*”.
- According to the later tradition, this rule is in the scope of Aṣṭ. 2.1.11 *vibhāṣā*, so that the formation of *dvandva* is optional. But Kiparsky (1979) argues that the *anuvṛtti* of *vā* (from Aṣṭ. 2.1.17) is stopped by the *nityam* in Aṣṭ. 2.2.17, and so *dvandvas* are obligatory, given a particular sequence of elements which could not stand independently.
- If compounding is obligatory, then the phrase in (1a) is not licit and the compound in (1b) should be formed.

- (1) a. *dhavaṃ* *khadiraṃ* *chinddhi*
dhava-tree.ACC.SG khadira-tree.ACC.SG cut.IMP.2SG
‘Cut down the dhava and khadira trees.’
- b. *dhava-khadirau* *chinddhi*
dhava-tree-khadira-tree.ACC.DU cut.IMP.2SG
‘Cut down the dhava and khadira trees.’

- Hence, purely on the basis of the *Aṣṭādhyāyī*, one could assume a variety of different approaches for interpreting the meaning of *ca* (or *cārtha*) and the conditions for *dvandva* compound formation, and this is indeed what we find in the later tradition.

3 Later interpretations of *cārtha* and *dvandva* formation

3.1 Kātyāyana

- Kātyāyana (ca. 250 B.C.) has a problem with Pāṇini's formulation of Aṣṭ. 2.2.29, because there are sentences where the sense of *ca* is understood, but a compound should not be formed. Patañjali exemplifies this with the phrase in bold in (2).

(2) a. *ahar ahar nayamāno* *gām* *aśvaṃ* *puruṣam* / *vaivasvato na*
 daily carry-off.PTCL.NOM.SG cow.ACC.SG horse.ACC.SG man.ACC.SG V.NOM.SG NEG
tṛpyati *surāyā* *iva durmadī*
 satisfy.PRS.3SG liquor.GEN.SG like drunk.NOM.SG

‘Vaivasvata is not satisfied (even by) daily carrying off (to death) a cow, a horse (and) a man, just like one who does not easily get drunk (is not satisfied) with (a small amount of?) liquor.’

- To prevent unwanted compounding, as in *gām aśvaṃ puruṣam* in (2), Kātyāyana rephrases Aṣṭ. 2.2.29 as *yugapadadhikaraṇavacane dvandvaḥ* ‘a *dvandva* is formed when the items meant are simultaneously referred to.’ A compound is not formed in this phrase because there is no simultaneous reference.
- His discussion assumes that *dvandva* can in principle be formed even when no *ca* is explicit, as shown in (2). One can even argue that Kātyāyana seems to take out *ca* and relies on the semantic notion of “simultaneous reference” to constraint compounding.

3.2 Patañjali

- Patañjali (ca. 150 B.C.) rejects the idea of *yugapadadhikaraṇavacana*. But he does accept the need to prevent *dvandva* formation in the case of *gām aśvaṃ puruṣam* in (2), where the meaning of *ca* is present.
- Patañjali's solution is to understand *cārtha* as *cena kṛte* ‘*rthe*’ ‘when the sense (of *ca*) is conveyed by the word *ca*’.
- Furthermore, Patañjali enumerates four different meanings of the word *ca*. These four meanings are: *samuccaya*, *anvācaya*, *itaretarayoga*, and *samāhāra*. As we will show later, these terms were understood and used differently by different scholars within the Indian tradition, but these differences are often overlooked, and/or different viewpoints conflated.
- Based on the discussion presented in Patañjali, we can summarize these meanings as follows:

Meanings of <i>ca</i>	Previous discourse?	What is said	What is understood
<i>samuccaya</i>	<i>nyagrodhaḥ</i> (?)	<i>plakṣaś ca</i>	<i>nyagrodhaś ca</i>
<i>anvācaya</i>	<i>nyagrodhaḥ</i> (?)	<i>plakṣaś ca</i>	<i>plakṣa</i> is dependent (and subordinate)
<i>itaretarayoga</i>	N/A	<i>plakṣaś ca nyagrodhaś ca</i>	each accompanied by the other
<i>samāhāra</i>	N/A	<i>plakṣaś ca nyagrodhaś ca</i>	a single whole consisting of both

- Note from the table above that the conjunction of items referred to seems to be based on nouns found in two distinct sentences in the case of *samuccaya* and *anvācaya*. This is not explicitly stated by Patañjali. But we can infer that

compound formation is not allowed in either of these two cases where the semantic connection indicated by *ca* crosses over from one sentence to another, as shown in the context presented by Kaiyaṭa (and Roodbergen) in (3).

- (3) a. *nyagrodho* *dṛśyatām!*
 banyan-tree.NOM.SG see.IMP.PASS.3SG
 ‘Look at the banyan tree!’
- b. *plakṣaś* *ca*
 fig-tree.NOM.SG and
 ‘And, the fig tree.’

- The difference in meaning between *samuccaya* and *anvācaya* would be determined by the context and whether *plakṣa* is considered dependent.
- The other two types, *itaretarayoga* and *samāhāra*, do allow compound formation. Based on the examples provided by Patañjali, one can infer further (as Nāgeśa does) that *dvandva* formation is tied to the occurrence or otherwise of *ca* **after each constituent member** within a single sentence and under one action.
- Under Patañjali’s analysis there is no need for a special rule to distinguish between *itaretarayoga* and *samāhāra* compounds, since the dual and plural is used “naturally” in *itaretarayoga* given the sense of “each accompanied by the other”, and the singular in *samāhāra* given the sense of “a single whole (unitary meaning) consisting of both”.
- Note that this last point is important, since under Kātyāyana’s *yugapadadhikaraṇavacana* assumption, we can explain the dual or plural of a *dvandva* compound, but not the singular form of a *samāhāra*. This type would require a special rule.

3.3 Kaiyaṭa

- Kaiyaṭa (ca. 1000 A.D.) also assumes that compounding is not allowed in the *samuccaya* and *anvācaya* types and, as Patañjali, he takes the example in (2) to discuss why compounding is not allowed here even when we have the meaning of *ca*.
- Kaiyaṭa accepts Patañjali’s interpretation of *cārthe* as *cena kṛte ’rthe*. Hence, in the example in (2), we do not have a compound in *samuccaya* because there is no explicit *ca*.
- In the case of *anvācaya*, compounding is not allowed because the two elements are not equal (i.e. one is predominant and the other one dependent (and subordinate)), and because there is only one *ca*, associated with the second element (*plakṣaś ca*), and the main element is not associated with the meaning of *ca*.
- Then, we can conclude that compounding is allowed in *itaretarayoga* and *samāhāra*, because they necessarily involve one *ca* for each coordinated element, and also because there is equality in the relationship between the elements. The difference between these two types is semantic, and it does not require further definition.
- Note that it is not clear whether *samuccaya* can involve an explicit use of *ca* for Kaiyaṭa.

3.4 Nāgeśa

- Nāgeśa (ca. 1700 A.D.) disagrees with Kaiyaṭa on treating *gām aśvaṃ puruṣam* in (2) as an example of *samuccaya*.
- He explains the meaning of *ca* as *sāhitya* ‘mutual connection’. This meaning of *sāhitya* may come about in different ways: (i) through the use of the word *ca* itself, or (ii) through compound formation, or (iii) it may come from other words.

- In the case of *gām aśvaṃ puruṣam*, Nāgeśa says that it comes from the *āmreḍita ahar ahaḥ* in (2), and so does not result in a compound. He attributes this understanding to Patañjali.
- Compound formation is not allowed in the *samuccaya* and *anvācaya* types because in these constructions there is only one *ca*, and so only one of the nouns is primarily connected with the conjunction. This is the same idea of imbalance/ lack of equality in the relation which is found in Kaiyaṭa in relation to *anvācaya*.
- To summarize, compounding seems to be licensed only when there are the same number of *cas* as items coordinated, and there is an equal relation between the items coordinated.
- In terms of the difference between *samuccaya* and *anvācaya* for Nāgeśa, there is nothing in the translation that Roodbergen (1974) provides, but he says that “in the case of *samuccaya* both items are connected with one action, whereas in *anvācaya* each item is connected with a different action.’ Roodbergen attributes this to the *Nyāsa*.
- Kaiyaṭa analyses *anvācaya* with the term *bhinnakakṣyatā* ‘having a different status’, which Nāgeśa glosses as *bhinnakriyānvayitā* ‘being connected with a different action.’
- The *Nyāsa* (ca. 800 A.D.) gives an example for *anvācaya* involving two different verbs, as shown in (4).

(4) *bho baṭo* *bhikṣām* *aṭa* *gāṃ* *ca ānaya*
 o brahmacārī.VOC.SG alms.ACC.SG collect.IMP.2SG cow.ACC.SG and bring.IMP.2SG
 ‘O brahmacārī, go out and collect alms, and bring in the cow.’

3.5 *Siddhāntakaumudī* and the *Bālaṃānoraṃā*

- Bhaṭṭoji Dīkṣita (ca. 1600 A.D.), in his *Siddhāntakaumudī*, takes the meanings of *ca* as those four enumerated by Patañjali.
- *Samuccaya* is defined as indicating a connection of multiple forms, which lack mutual expectancy, with a single item (verb). The example listed for *samuccaya* is the one shown in (5).

(5) *īśvaram* *guruṃ* *ca bhajasva*
 god.ACC.SG teacher.ACC.SG and worship.IMP.2SG
 ‘Be devoted to god and (your) teacher.’

- According to Vāsudeva Dīkṣita (ca. 1700 A.D.) in his commentary on the *Siddhāntakaumudī*, the *Bālaṃānoraṃā*, there is only linkage of *ca* with the second item in (5), hence the teacher has an expectancy for god, but god does not have an expectancy for the teacher. Because it lacks a linkage, this amounts to two sentences: ‘be devoted to god’, and also, ‘be devoted to (your) teacher’.
- The *anvācaya* type is defined as occurring when one or the other (of these forms) is dependent (and subordinate) in that (connection). The *Bālaṃānoraṃā* further defines *anvācaya* as an instance where one or the other of the words is connected to a single verb as concomitant (and secondary) (*ānuṣaṅgika*), that is has having its range an activity that is dependent (subsidiary), while the other word is connected with a different verb as its intended object.
- The example listed for *anvācaya* is given in (4) above, in which there is not a simple item coordination, but two actions are included. But in this case compounding does not occur because of the lack of *sāmarthyā* ‘the state of having inter-connected meanings’, as in the case of *samuccaya*. According to the *Bālaṃānoraṃā*, the intended meaning in (4) is ‘do the begging round, (and) if at that time you come across a cow, then also bring her, but do not exert yourself in bringing the cow as your intention’.

- The *itaretarayoga* type is defined as a connection (with a verb) of forms that are joined together (*milita*). This is a connection of mutually expectant forms, that are joined together, with a single verb, i.e., the condition of being mutually accompanying (or assisting) (*parasparasāhacarya*). For example, in (1) above, *dhava-khadirau* means ‘both a *dhava* and also a *khadira*’. Two ‘*ca*’ words are used to point to the condition of mutuality (*parasparasāhitya*).
- According to the *Bālamanoramā*, in an *itaretarayoga dvandva* mutual connection (*sāhitya*) is a qualifier of the things (*dravyas*), as in ‘cut the *dhavakhadirau*’ in (1a), where the understanding is of two items that have come together (*samudita*) and are each connected with the same action.
- The *samāhāra* type indicates a collection (*samūha*). According to the *Bālamanoramā*, in a *samāhāra dvandva* the collection is what is qualified, as in the compound in (6), where the connection with the action and the collection of the two is understood through the medium of the items in the collection.

(6) *saṃjñā-paribhāṣam* *adhīte*
 technical-term-interpretation-rules.NOM.SG study.PRS.3SG
 ‘He studies technical names and rules of interpretation.’

- In both commentaries, compounding is not allowed in the types *samuccaya* and *anvācaya* because of the lack of *sāmarthyā*. Consequently, because there exists the condition of mutuality (*parasparasāhitya*) only in the *itaretarayoga* and *samāhāra* meanings of ‘*ca*’, they (are based on words that) are *samartha* (i.e., have inter-connected meanings) and so there is a *dvandva* compound.

3.6 Gaṇaratnamahodadhi

- Vardhamāna’s *Gaṇaratnamahodadhi* (c. 1150 A.D.), a commentary on the Pāṇinian *Gaṇapāṭha*, ascribes nine meanings/functions to the particle *ca*.

1. *anvācaya*: aggregation of a less important item

(7) *bhikṣām* *aṭa* *gām* *ca ānaya*
 alms.ACC.SG wander.IMP.2SG cow.ACC.SG and bring.IMP.2SG
 ‘Go out and collect alms, and bring in the cow.’

2. *samāhāra*: collective combination

(8) *pāṇī ca pādau ca* ⇒

pāṇi-pādam
 hand-foot.NOM.SG
 ‘the two hands and the two feet’

3. *itaretara*: mutual connection

(9) *plakṣaś ca nyagrodhaś ca* ⇒

plakṣa-nyagrodhau
 fig-banyan.NOM.DU
 ‘the fig and the banyan trees’

4. *samuccaya*: aggregation

- (10) *pacati ca paṭhati ca caitraḥ*
 cook.PRS.3SG and read.PRS.3SG and Caitra.NOM.SG
 ‘Caitra cooks and reads.’

5. *viniyoga*: command

- (11) *ahaṃ ca tvam ca putra gacchāvaḥ*
 I.NOM.1SG and you.NOM.2SG and son.VOC.SG go.PRS.1.PL
 ‘Let’s go, son, you and I.’

6. *tulyayogitā*: ‘equal joining’, a figure of speech

- (12) *kṛtaṃ ca garva-abhimukhaṃ manas tvayā*
 do.PTCL.NOM.SG and arrogance-facing.NOM.SG mind.NOM.SG you.INS.SG
kim anyad evaṃ nihatās ca no dviṣaḥ
 what other thus kill.PTCL.NOM.PL and our.GEN.1PL enemy.NOM.PL
 ‘You turned your mind towards arrogance—what else?—and thus [you] destroyed our enemies.’

7. *avadhāraṇa*: emphasis (use of *ca* as *eva*)

- (13) *atītaḥ panthānaṃ tava ca mahimā vān-manasayoḥ*
 pass.PTCL.NOM.SG path.ACC.SG you.GEN.SG certainly greatness.NOM.SG speech-mind.GEN.DU
 ‘Your greatness is certainly beyond the reach of speech and mind.’

8. *hetu*: causal implication

- (14) *grāmo na gantavyaḥ, śītaṃ ca*
 village.NOM.SG not to-be-gone-to.GERUNDIVE.NOM.SG coldness.NOM.SG because-of
 ‘The village should not be gone to, and (because) it is cold.’

9. *pādapūraṇa*: filling out a verse-quarter

- (15) *bhīmaḥ pārthas tathā eva ca*
 Bhīma.NOM.SG son-of-Prthā.NOM.SG likewise EMPH *pādapūraṇa*
 ‘Bhīma and Arjuna’

4 Conclusions

4.1 The meanings of *ca*

- *samuccaya*:

- What is clear in Patañjali is that there is an inequality on the surface level, only one *ca*, but we understand an equality on a more semantic level. But otherwise, even the idea that *samuccaya* cannot involve compounding involves reading in later ideas.

- For Kaiyaṭa, *samuccaya* may not involve an explicit *ca*, and it is unclear whether it can.
- For Nāgeśa, it involves a single explicit *ca*, and there can be no compounding.
- *anvācaya*:
 - For Patañjali, there is a single *ca*, and a notion of dependence (and subordination). This is true also for the later commentators.
- *itaretara*:
 - From Patañjali there is agreement that there are as many *cas* as coordinated items.
- *samāhāra*:
 - As far as this is discussed, there is agreement that it is distinguished semantically from *itaretara*.
 - Kātyāyana’s proposal (*yugapadadhikaraṇavacana*) is problematic for this type, and from Patañjali on is rejected for precisely that reason.
- *other meanings*:
 - Meanings 5–8, which appear to be less common, are also found in Hemacandra’s *Anekārthasaṃgraha* and warrant further investigation.

4.2 Implications for coordination

- Quite a lot remains unclear, but it is significant that from Patañjali onwards the discussion centres around the explicit presence or otherwise of *ca*, and seems to assume that compound formation is based on the presence of multiple *cas*. This is perhaps the opposite of Pāṇini’s original intention.
- What is quite unclear is what variety of levels we have to assume in the linguistic system, and where these *cas* do and do not appear.
- Predominantly, the discussion focuses on coordination of nouns, and the question of *dvandva* formation, but there is marginal treatment of *ca* as a sentence-connective.
- According to Lang (1984: 19), to form a coordinate structure, the conjuncts linked by a connector must meet a set of conditions on their structural homogeneity. In other words, conjuncts in a coordinate structure must be of the “same type” (Chomsky 1957). This too is argued in the later Sanskrit tradition, with a requirement that the syntactic connection be *ekadharmāvachinna* ‘limited by one and the same feature’, but examples of this lie beyond the scope of this talk.

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