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ORDER OF OPERATIONS IN THE FORMATION OF SANSKRIT COMPOUNDS:
WITH SPECIAL REFERENCE TO INTRODUCTION OF *SAMĀSĀNTA* ELEMENT AND DELETION OF CASE ENDINGS

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1 BACKGROUND

Sanskrit is rich in compound formation with almost one among every fifth word in a text being a compound.[1] The effort of building an exhaustive lexicon for a select few thousand texts, including the compounds occuring in these texts with their constituency analysis, is ongoing at the Deccan College. But even after the availability of such a lexicon, we still would not have a list of *all* the compounds found in Sanskrit literature, since only a few thousand texts are being used for building this dictionary. In addition, no matter what the extent of textual material, it would not exhaust the possibilities of a productive system, captured by rules. Though compound formation is productive, not every lexical item can combine with every other lexical item and yield a compound. A compound formation is governed by the dictum of *samarthaḥ padavidhiḥ* (A2.1.1). Two components can undergo a process of compound formation only if the components are semantically and syntactically related (*samartha*). Therefore, building a compound analyser is a challenging task. One can at the most build an analyser that provides 'guessed'

1. This estimate is based on the corpus developed by the Sanskrit Consortium for the project on 'Development of tools for Analysis of Sanskrit texts and Sanskrit-Hindi Machine Translation System' funded by Deity (2008-12), Government of India.

solutions, which are subject to verification for their correctness through a compound generator.

Pāṇini deals with compounds very thoroughly, handling exceptional cases in great detail. Out of around 4000 *sūtras* in *Aṣṭādhyāyī* a little more than 400 *sūtras* deal with the compound formation. Further, following Pāṇini, in Indian grammatical tradition, there is an abundant discussion of compounds both at the level of the compound formation (*prakriyā*) involving morphology and phonology', and at the level of meaning analysis (*artha*). In recent years, many scholars have worked on compounds on both these aspects. Joshi (1968) gives a detailed account of the discussion involved in the Indian tradition on semantic compatibility and meaning compositionality. Pataskar (1996) has discussed the use of the *dvandva* compounds in *Pāṇini-sūtras* in relation to their case endings. Bhandare (1995) has discussed the structural and semantic aspects of *dvandva* compounds. He discusses the complete process of *dvandva* compound formation and observes that unlike other compounds *dvandva* compounds enjoy some free word order among its components. Mahavir (1986) talks about the process of generating a compound from its paraphrase (*vigrahavākya*). Compounds are always binary with an exception of conjunctive (*dvandva*) and some exocentric (*bahuvrīhi*) compounds. Individual components of the compounds can themselves be compounds, thus allowing recursion in the formation of compounds. For understanding such compounds the underlying constituency structure is important. Gillon (2009) proposes an extended phrase structure syntax to represent the underlying constituent structure of the compounds. On the computational front, Kumar (2012) has proposed a computational process for the analysis of Sanskrit compounds. While this system uses Pāṇini's rules for identification of the type and analysis of exceptional compounds, the frequent compound type identification and analysis are done using the statistical properties of the corpus. Goyal and Huet (2013) describes computational analyses of *avyayībhāva* compounds.

With the goal of building a compound generator, we looked at Pāṇini's system afresh. The *sūtras* related to compound formation are distributed in different chapters in the *Aṣṭādhyāyī* according to the kind of operation described therein. In the fourth *pāda* of the first chapter of the *Aṣṭādhyāyī sūtras* from

ūryādicvidācaśca (A1.4.61) to *jīvikopaniṣadāv-aupamye* (A1.4.79) assign to given items under stated conditions the label *gati*, and members of this class form compounds. *Sūtras* starting from *samarthaḥ padavidiḥ* (A2.1.1) to *cārthe dvandvaḥ* (A2.2.29) are related to the formation of a compound. *Sūtras* from *upasarjanaṃ pūrvam* (A2.2.30) to *kaḍārāḥ karmadhāraye* (A2.2.38) are related to the word order in the compounds. In the fifth chapter *sūtras* from *samāsāntāḥ* (A5.4.68) to *niṣpravāṇiśca* (A5.4.160) introduce special entities related to compounds and called *samāsānta*. The third section of the sixth chapter has several *sūtras* which deal with various stages of compound formation. *Sūtras* from *alug uttarapade* (A6.3.1) to *vibhāṣā svasṛpatyoḥ* (A6.3.24) prohibit the deletion of the case endings, and the *sūtras* from *kustumburūṇi jātiḥ* (A6.1.143) to *pāraskaraprabhṛtīni ca saṃjñāyām* (A6.1.157) and from *ānaṅ ṛto dvandve* (A6.3.25) to *mitre carṣau* (A6.3.130) transform the first constituent and second constituent of a compound.

2   COMPOUND FORMATION PROCEDURE

We describe below the steps involved in the process of compound formation followed in the Pāṇinian tradition.

1.   Analytical paraphrase (*alaukikavigraha*)

Assume that a speaker wants to express a concept 'a person who is a servant of a king'. There are three basic elements involved in this concept, viz. a person, a king and a servant-master relation between them. The servant-master relation *(sevya-sevaka-bhāva)* in Sanskrit is expressed by the genitive case suffix. This concept is represented in the form of a linguistic expression as

$$rājan + Ṅas\ puruṣa + sU$$

where the words *rājan* and *puruṣa* denote a king and a man respectively, *Ṅas* and *sU* are the genitive and nominative case suffixes respectively. This representation showing the linguistic analysis of a compound is called an *alaukikavigraha* and is the starting point of the derivation of a compound.

2. (a) Assignment of the label *samāsa* :

The compound formation is purely under the control of the desire of a speaker (*vaktṛvivakṣādhīnam*) to express. In the derivation process, corresponding to an *alaukikavigraha*, the speaker has an option to produce either a sentential expression or a compound expression[2]. The choice is governed by a condition that the components involved are mutually syntactically and semantically related[3]. In other words, there should be some rule in the grammar which guarantees the formation of a compound with given components and the desired meaning. In the above example, the components *rājan* and *puruṣa* are semantically related (*samartha*), and hence if the speaker has an intention to form a compound, the Pāṇinian *sūtra ṣaṣṭhī* (A2.2.8) sanctions the formation of such a compound. Such an *alaukikavigraha* then gets the designation *samāsa*.

(b) Introduction of a *samāsānta* element:

There are certain suffixes which are added to the compound at the end of an *alaukikavigraha*. And also there are certain replacements which take place at the end of an *alaukikavigraha*. These are called *samāsānta* elements. For example, the *sūtra avyayībhāve śaratprabhṛtibhyaḥ* (A5.4.107) adds a suffix *TaC* if the compound is of the type *avyayībhāva* and one of the word is from a special list that starts with *śarad*. Thus

$$\text{śarad + Ṅas upa} \rightarrow \text{śarad + Ṅas upa TaC}$$

3. Designation of *prātipadika* :

Such an expression then gets designated with a label *prātipadika*[4].

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2. Strictly speaking, there are certain compounds which are termed as *nityasamāsas* (*avigrahaḥ asvapadavigraho vā nityasamāsaḥ* · PMa (I:568)) whose sentential paraphrase necessarily involves components that are not constituents of the compound. Such compounds are governed by the *sūtras* falling in the range A2.1.5 to A2.1.10. Barring these, all the compounds can optionally be expressed as a sentential paraphrase as well.

3. *samarthaḥ padavidhiḥ* (A2.1.1)

4. *kṛttaddhitasamāsāśca* (A1.2.46)

4. Determining the order of constituents by assigning the label *upasarjana*

The position of the head (*viśeṣya*) of a compound more or less depends on the type of a compound. A *tatpuruṣa* (endocentric) compound has the second component as its head while an *avyayībhāva* has the first component as the head. In the case of a *bahuvrīhi* (exo-centric) the head is the one which this compound modifies and in the case of a conjunctive compound, every component has equal importance. However there are many exceptions to this general observation. So the mere type of a compound does not help us in deciding the word order. Pāṇini uses a special mechanism to mark the order of words in a compound. Pāṇini labels a component that will occupy the first position by the term *upasarjana*. The designator of a word in nominative case in the governing rule, which sanctions the compound formation and decides the compound type, is the one which gets the designation *upasarjana*. For example consider the *alaukikavigraha*

$$śarad + Nas\ upa$$

The *sūtra*[5] which sanctions the compound formation for this input consists of two words. Among these the word *avyayam* in the *sūtra* is in nominative. Hence that word in the *alaukikavigraha* which is an *avyaya* gets the label *upasarjana*. In the above-mentioned example *upa* being an *avyaya*, it gets the label *upasarjana*.

5. Changing the order of the components (*pūrvanipāta*)

The consequence of assigning a label *upasarjana* is to place the word having designated as *upasarjana* in the first position. This operation is termed as *pūrvanipāta*. In the above-mentioned example, *upa* which got the label *upasarjana* occupies the first position changing the *alaukikavigraha* to

$$upa\ śarad + Nas$$

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5   *avyayam vibhakti-samīpa-samṛddhi-vyṛddhyarthābhāvātyayāsamprati-*
     śabdaprādurbhāva-paścādyathānupūrvya-yaugapadya sādṛśya-sampatti-
     sākalyāntavacaneṣu (A2.1.6)

Bahuvrīhi and *dvandva* deserve special mention.The governing *sūtra* in *bahuvrīhi* is *anekamanyapadārthe* (A2.2.24). Here the word in nominative case is *anekam* which refers to all the components together (undergoing the compound formation). And thus, each of the components gets *upasarjana* label. In the case of *dvandva*, the governing rule is *cārthe dvandvaḥ* (A2.2.29). In this *sūtra* there is no word that ends in a nominative case. Hence, there is no scope for assigning the label *upasarjana*. In such cases Pāṇini gives special rules to decide the first component (*pūrvanipāta*).

6. Deletion of case suffixes *(subluk)*

Typically in a compound formation the case suffixes of all the components get deleted. There are, however, certain exceptional cases when the case suffix of the initial component does not get elided[6]. For example, in the following case

$$yudh + Ni^7 \; sthira + sU$$

Ni is retained. But in the case of

$$rājan + Nas \; puruṣa + sU$$

Nas is deleted. In either case the case suffix of the second component is deleted. This transforms the above two cases into *yudh + Ni sthira* and *rājan puruṣa* respectively.

7. Transformation of the components (*padakārya*)

In certain cases, the first component undergoes certain transformations if the second component fulfills certain conditions. For example, *pāda* changes to *pad*[8] if it is followed by either *āji, āti, ga* or *upahata*.

$$pāda + āti \rightarrow pad + āti$$

In certain cases, the second component also undergoes certain changes if

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6. *aluguttarapade* (A6.3.1)

7. *haladantāt saptamyāḥ saṁjñāyām* (A6.3.9)

8. *pādasya pādā'jyātigopahateṣu* (A6.3.52)

the first component fulfills certain conditions. For example, *sthira* changes to *ṣṭhira*[9] in the presence of *yudhi.*

$$yudhi + sthira \rightarrow yudhi \, ṣṭhira$$

Each of the components thus transformed may undergo certain operations that are independent of the other words in the context. For example, in the case of *rājan* the final *n* gets deleted[10].

8. Euphonic transformations at the juncture (*sandhikārya*)

The two components thus transformed undergo euphonic transformations. For example,

$$rāma \, ālaya \rightarrow rāmālaya[11]$$

9. Deciding gender, number and accent

Such a stem is now all set to undergo word formation rules. But before that, a stem should get its proper gender, number and accent. Gender is an intrinsic property of a nominal stem[12]. The type of a compound helps in deciding the gender of the new lexeme formed. An *avyayībhāva* compound stem is always in neuter gender[13], while in the case of *tatpuruṣa* and *dvandva* compounds[14] the gender of the compound stem is the same as that of the second component and in the case of *bahuvrīhi* the gender is the same as that of the word it modifies[15]. There are of course a few exceptional cases which are dealt with by Pāṇini with special rules.

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9   *gaviyudhibhyāṃ sthiraḥ* (A8.3.95)

10   *nalopaḥ prātipadikāntasya* (A8.2.7)

11   *akaḥ savarṇe dīrghaḥ* (A6.1.101)

12   *ekaṃ dvikaṃ trikaṃ cātha catuṣkaṃ pañcakaṃ tathā nāmārtha iti sarve'mī pakṣāḥ śāstre nirūpitāḥ* - VBhs*(nāmārthanirṇayaḥ* 216 (1)

13   *avyāyībhāvaśca* (A2.4.18)

14   *paravalliṅgam dvandvatatpuruṣayoḥ* (A2.4.26)

15   *anekamanyapadārthe* (A2.2.24)

In the case of a *tatpuruṣa* the number is the same as the number of its primary component. A *bahuvrīhi* compound gets its number from its referent. *Avyayībhāva* and *samāhāra-dvandva* are always singular in number[16]. In case of an *itaretara-dvandva*, the number of the resulting compound depends on the nature and the number of its components.

A compound is characterized by a single accent. Usually the final vowel in a compound is *udātta*[17] (high-pitched). *Tatpuruṣa* and *avyayībhāva* compounds have a high pitch at the end (*antodātta*). *Bahuvrīhi*, and *dvandva* compounds have the same accent as that of the *pūrvapada*[18]. These are the general rules and there are some exceptions to them.

10. Word formation

The final step is the word formation with an appropriate case ending.

3 THEORETICAL ISSUES IN COMPOUND FORMATION

As is well-known, the Pāṇinian system does not give an explicit step by step procedure to derive a compound from its components. Rather what it describes is what transformations take place when certain conditions are met. In order to decide the order of these steps, to develop an algorithm ('how') to generate a compound from its components, we looked at some worked-out examples from *Pāṇinīya-vyākaraṇodāharaṇa-kośa* and the appendices of *Aṣṭādhyāyī-bhāṣya-prathamāvṛtti* by Brahmadatta Jijñāsu.

A typical process of compound formation followed by several teachers and important collection of meticulously worked-out examples such as *Pāṇinīyavyākaraṇodāharaṇakośa* is sketched below. The generation process of a ·compound starts with an *alaukikavigraha*, and this expression gets the designation *samāsa*, followed by another designation, *prātipadika*. This is followed by the elision of case endings (*subluk*[19]) in the case of non-*aluk* compounds. Then

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16 *samāhāra grahaṇaṃ kartavyam* (*Vārttika* 1559) MBh A2.4.1 (II.534))

17 *samāsasya* (A6.1.223)

18 *bahuvrīhau prakṛtyā pūrvapadam* (A6.2.1)

19 *supo dhātuprātipadikayoḥ* (A2.4.71)

assignment of the label *upasarjana* and consequent placement as prior or subsequent constituent take place. At this point, entities called *samāsānta* come into effect. There follow operations on prior constituents (*pūrvapadakārya*), subsequent constituents (*uttarapadakārya*), word operations (*padakārya*), and phonological operations that apply at junctures (*sandhikārya*); finally, the gender, number and accent of the newly formed lexeme are decided and an appropriate case ending is added to get the compound. This process is shown as a flow chart in Figure 1.

The derivation of *uparājam* as found in *Pāninīyavyākaranakośa* and *Aṣṭādhyāyībhāṣyaprathamāvrtti* is shown in figures 2 and 3 respectively.
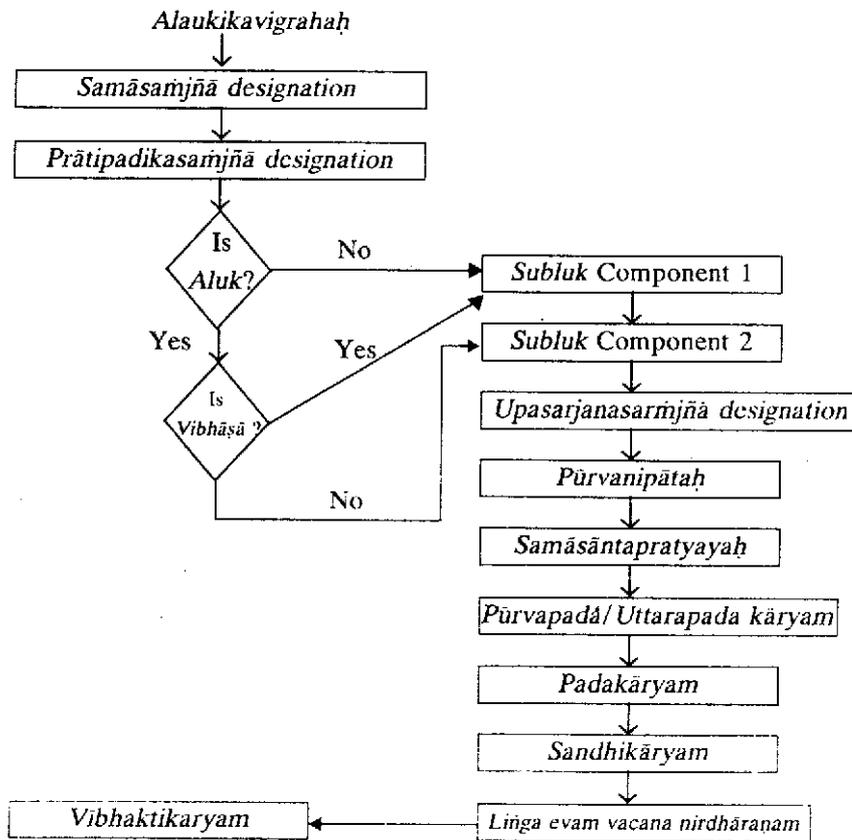
Figure 1 : Process of Compound Generation (1)

उपराजम्

राजन् + अस् + उप	अव्ययं विभक्ति...	2.1.006/0652	समीपार्थकस्य उप इति अव्ययस्य राजन्शब्देन अव्ययीभावसमासः
	कृत्तद्धितसमासाश्च	1.2.046/0179	समासत्वात् प्रातिपदिकसंज्ञा
राजन् + उप	सुपो धातुप्राति...	2.4.071/0650	प्रातिपदिकावयवस्य सुपो लुक्
	प्रथमानिनिर्दिष्टम्...	1.2.043/0653	समासशास्त्रे प्रथमान्तेन निर्दिष्टस्य उप इत्यस्य उपसर्जनसंज्ञा
उप + राजन्	उपसर्जनं पूर्वम्	2.2.030/0654	उपसर्जनस्य उप इत्यस्य पूर्वनिपातः
उप + राजन् + अ	अनश्च	5.4.108/0678	अन्नन्तात् अव्ययीभावात् टच्
उप + राज + अ	नस्तद्धिते	6.4.144/0679	नान्तस्य भसंज्ञकस्य टेर्लोपः
उपराज + स्	स्वौजसमौट्...	4.1.002/0183	प्रथमाविभक्तौ एकवचने सुप्रत्ययः
उपराज + अम्	नाव्ययीभावात्...	2.4.083/0657	अदन्तादव्ययीभावात् परस्य सोः अमादेशः
उपराजम्	अमि पूर्वः	6.1.107/0194	अदन्तादव्ययीभावात् परस्य सोः उमादेशः

टिप्पणी:- राज्ञः समीपम् उपराजम् । उपकृष्णवत् 'अव्ययं

विभक्तिसमीपसमृद्धिव्यृद्ध्यर्थाभावात्ययासम्प्रति...' 2.1.006/0652   इति सूत्रेण समीपार्थे उपशब्दस्य अव्ययीभावः । समासविधायकसूत्रे अव्ययमिति प्रथमाविभक्त्या निर्देशात् अत्र समीपार्थकस्य उप इत्यव्ययस्य उपसर्जनसंज्ञा । 'अनश्च' 5.4.108/0678 इति सूत्रस्य उदाहरणम् । अनेन सूत्रेण अन्नन्तात् अव्ययीभावात् समासान्तः टच्-प्रत्ययः । 'नस्तद्धिते' 6.4.144/0679 इति नान्तस्य भस्य अन्-रुपस्य टेः लोपः । अव्ययीभावस्य अव्ययसंज्ञायाम् 'अव्ययादाप्सुपः' 2.4.082/0452 इति प्राप्तं लुकं बाधित्वा सोः अमादेश ।

Figure 2 : Example from *Pāṇinīyavyākaraṇidāharaṇakoṣa*

परि॰ समासान्ताः (5.4.68)

राज्ञः समीपम् = उपराजम्

उप सु राजन् इस्	पूर्ववत् उपकुम्भम् के समान समीपार्थ में अव्ययीभावसमास होकर
उपराजन्	अनश्च (5.4.108) से समासान्त टच् प्रत्यय होकर
उपराजन् टच्	पूर्ववत् सु आकर
उपराजन् अ सु	यचि भम् (1.4.18), भस्य (6.4.129), नस्तद्धिते (6.4.144) से टि भाग का लोप होकर
उपराजन् अ सु	अव्ययीभाव संज्ञा उपराज की तो है ही; किन्तु टच् प्रत्यय के समास के अवयव होने के कारण टच् सहित उपराज अव्ययीभाव कहलाया । अतःनाव्ययीभावादतो॰ (2.4.83) के अकारान्त अव्ययीभाव मानकर सु को अम् हो गया ।
उपराज अम्	अमि पूर्वः (6.1.107)से पूर्वरुप होकर
उपराजम्	बना

राजसु अधिकृतम् अधिराजम् में विभक्त्यर्थ में समास होकर शेष सब कार्य पूर्ववत् हुए हैं ।टच् को समास का अवयव मानने से शेष पूर्ववत् ही लाभ है ।

Figure 3 : Example from *Aṣṭādhyāyībhāṣyaprathamāvṛtti*

In both these derivations, we observe that the *samāsānta-pratyaya tac* is added only after deciding the order of the components. Brahmadatta Jijñāsu adds the following note: *uparāja* gets the designation *avyayībhāva*. But since *TaC* is a part of the compound, *uparāja* followed by *TaC* will get the designation *avyayībhāva*.[20] This note intrigued us, and made us look at the original commentaries. There are differences of opinion regarding the order of operations shown in Figure 1, especially with reference to the deletion of case suffixes and addition of a *samāsānta*·elements. In the following sections we will discuss the arguments in favour and against the two questions:

1. When should case suffixes be elided?

    Should they be elided before assigning the label *upasarjana* or after?

2. At what stage should the *samāsānta* element be introduced?

    Should we introduce it at the beginning of the compound formation process or after deciding the order of the components?

4ʹ WHEN SHOULD CASE·SUFFIXES BE ELIDED?

If one deletes case suffixes before assigning the label *upasarjana*, it poses a problem in several cases. The designator of a word in nominative case in the governing rule, which sanctions the compound formation and decides the compound type, is the one which gets the label *upasarjana*. So when a governing rule has a nominative word indicating a case suffix, say X, that component in the *alaukikavigraha* which has the case suffix 'X' will get the label *upasarjana*. If this case suffix is deleted from the *alaukikavigraha*, then there is no room to assign the *upasarjana* label. We illustrate this with an example.

Consider the *alaukikavigraha rājan + Nas puruṣa + sU*. The governing *sūtra*, in this case, for compound formation is *ṣaṣṭhī* (A2.2.8). The *sūtra prathamānirdiṣṭam samāsa upasarjanam* (A1.2.43) says that in the *sūtra* providing for the formation of a compound (*samāsa vidhāyakasūtra*), the referent of the

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20. अव्ययीभाव संज्ञा उपराज की तो है ही; किन्तु टच् प्रत्यय के समास के अव्यय होने के कारण टच् सहित उपराज अव्ययीभाव कहलाया । अतः नाव्ययीभावादतो॰ (२.४,८३) के अ-कारान्त अव्ययीभाव मान्कर सु को अम् हो गया

   Aṣṭādhyāyībhāṣyaprathamāvṛtti by Brahmadatta Jijñāsu

word in nominative case in the *sūtra* will get designated as *upasarjana*. Now in the *sūtra* *saṣṭhī* (A2.2.8), there is only one word, and it is in nominative. Hence the word with a genetive ending (*saṣṭhī vibhakti*) in the *alaukikavigraha* viz. *rājan + Ñas* gets designated as *upasarjana*.

Now if the case suffix is deleted first, then in the absence of a genitive case marker, it is not possible to assign *rājan* the label *upasarjana*. In such a situation, with the help of a *sūtra pratyayalope pratyayalakṣaṇam* (A1.1.62)('an operation conditioned by an affix applies even if tĥe affix has been replaced by zero[21]'), one can still assign it the label *upasarjana* even after the deletion of a nominal ending (*subluk*). See for example, Figŭre 2. There is no blocking (*bādhyabādhakabhāva*) between the two operations - *subluk* and assigning the label *upasarjana*.

However, as is evident from this discussion even if there is no *bādhya-bādhakabhāva*, in order to designate a label *upasarjana* after the deletion of case suffixes, one needs to invoke another *sūtra, pratyayalope pratyayalakṣaṇam* (A1.1.62). Thus there is an extra effort involved in the process leading to prolixity (*gaurava*). If we first designate the word with a label *upasarjana* based on the case suffix and then we delete it, we need not invoke *pratyayalope pratyayalakṣaṇam* (A1.1.62). This results in brevity (*lāghava*).

5 AT WHAT ŜTAGE SHOULD THE SAMĀSaNTA ELEMENT BE ADDED?

Pāṇini introduced 20 entities called *samāsānta* in the *Aṣṭādhyāyī* from *samāsāntāḥ* (A5.4.68) to *niṣpravāṇiśca* (A5.4.160). They are: *ḌaC, a, aC, ahnādeśa, ṬaC, ṢaC, Ṣa, aP, aC, asIC, anIC, iC, jñu, anAÑ, niÑ, iṭ, lopa, datṛ, hṛt*, and *kaP*.

The *sūtra samāsāntāḥ* (A5.4.68) says that "The *taddhita* affix[22] introduced, henceforth, ʻoccurs at the end (*anta*) of a nominal stem termed compound (*samāsa*)"[23].

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21. The *Aṣṭādhyāyī* of Pāṇini, Sharma: 2000 : II : 63

22. It is appropriate to call it an element rather than affix, since in some cases it represents a replacement.

23. The *Aṣṭādhyāyī* of Pāṇini, Sharma : 2000 : IV : 704

In what follows we will first state Bhaṭṭoji Dīkṣita's position, where he treats *samāsānta* element sometimes as a terminating part of a compound and sometimes as a terminating part of the second component. We will argue that Bhaṭṭoji's treatment is faulty providing evidence from *Mahābhāṣya,* and also a supportive commentary by Nāgeśa.

1 Bhaṭṭoji on *samāsānta*

In the *Prauḍhamanoramā,* Bhaṭṭoji Dīkṣita writes

> *Samāsāntā iti | Samāsasya samāsārthottarapadasya vā*
> *caramāvayava ityarthaḥ | tenopaśaradamityatra "nāvyayībhāvāt"*
> *(A2.4.83) ityaṃ, dvipurītyādau "dvigoḥ"(A4.1.21) iti ñīp ca*
> *sidhyati|*

According to Bhaṭṭoji Dīkṣita, the *samāsānta* suffix can be either the terminating part of the complete analytical paraphrase or of the *uttarapada* of the *samāsa.* According to him, there are cases in which one needs to treat the *samāsānta* suffix as a part of the analytical paraphrase and cases where one needs to consider the *samāsānta* suffix as a part of an *uttarapada.* We explain both these cases with an example each.

Consider the formation of the compound *upaśaradam.*

Example 1:

alaukikavigrahaḥ : *śarad + Nas upa*

samāsāntaḥ : *śarad + Nas upa [T]a[Cf⁴*

Here the whole expression gets the label *samāsa.*

prātipadikasaṃjñā : *śarad + Nas upa a,* now it gets the label *prātipadika*[25]

upasarjanasaṃjñā : *śarad + Nas upa*[26] *a, upa* gets the label *upasarjana*

24. *avyayībhāve śaratprabhṛtibhyaḥ* (A5.4.107)

25. *kṛttaddhitasamāsāśca* (A1.2.46)

26. *prathamānirdiṣṭam samāsa upasarjanam* (A1.2.43)

pūrvanipātaḥ : *upa*[27] *śarad* + *Nas a*

subluk : *upa śarad a*[28]

sandhikāryam : *upaśarada*

liṅganirdhāraṇam : *upaśarada*, neuter gender[29]

vibhaktikāryam: *upaśarada* +*sU* → *upaśarada* + *am*, due to the replacement of *sU* by *am*[30]. *upaśarada* + *am* → *upaśaradam*[31]

Now we look at another example, which Bhaṭṭoji Dīkṣita used to show the necessity of considering *samāsānta*suffix as a part of an *uttarapada*. The example is generation of the compound *dvipurī*.

Example 2:

alaukikavigrahaḥ : *dvi* + *os pur* + os

samāsāntaḥ : [*dvi* + *os* (*pur* + *os*] *a*[32])[33]

prātipadikasaṁjñā : [*dvi* + *os* (*pur* + *os*] *a*)[34]

upasarjanasaṁjñā : [*dvi* + *os*[35] (*pur* + *os*] *a*)

pūrvanipātaḥ : [*dvi* + *os*[36] (*pur* · *os*]*a*)

subluk[37] : [*dvi* (*pur*] *a*)

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27. *upasarjanaṁ pūrvam* (A2.2.30)

28. *supo dhātuprātipadikayoḥ* (A2.4.71)

29. *avyayībhāvaśca* (A2.4.18)

30. *nāvyayībhāvādato 'mtvapañcamyāḥ* (A2.4.83)

31. *ami pūrvaḥ* (A6.1.107)

32. *ṛkpūrabdhūḥ pathāmānakṣe* (A5.4.74)

33. We have marked the expression that gets *samāsasaṁjñā* by [ ] and an expression in ( ) is the *uttarapada*. Note here that *a* of the *samāsānta* suffix is now part of the *uttarapada* but not of the *samāsa*.

34. *kṛttaddhitasamāsāśca* (A1.2.46)

35. *prathamānirdiṣṭaṁ samāsa upasarjanam* (A1.2.43)

36. *upasarjanaṁ pūrvam* (A2.2.30)

37. *supo dhātuprātipadikayoḥ* (A2.4.71)

sandhikāryam :[*dvi*(*pur*] *a*)

linganirdhāraṇam : [*dvi*(*pur*] *a*), feminine gender

vibhaktikāryam : [*dvi*(*pur*] *a*) → *dvipura* + *ñīp* → *dvipurī*.

In this example the *samāsānta* suffix *a* is a part of an *uttarapada*. Hence by the *vārttika akārāntottarapado dviguḥ striyām bhāṣyataḥ iti vaktavyam*[38] the feminine suffix will be added to the entire compound. The *vārttika* says that in a *dvigu* compound if the *uttarapada* is a *prātipadika* ending in *a* then the feminine suffix *ñīp* is added to the compound.

From these two examples, it is clear that in one example, to arrive at the desired form one has to accept a *samāsānta* suffix as a part of the *alaukikavigraha* while in the other, as a part of the *uttarapada*.

2   Patañjali on *samāsānta*

If we look at Patañjali's commentary, then it is clear that he subscribes to only the first view viz. that the *samāsānta* suffix is a part of complete *alaukikavigraha*, and not the *uttarapada*. The discussion on the status of *samāsānta* elements in *Mahābhāsya* appears under the commentary of the *sūtra gostriyorupasarjanasya* (A1.2.48) ('The final long vowel of a *prātipadika*) ending in a word 'go' or a feminine suffix (at the end of a word which occur) as '*upasarjana*' (gets shortened').

The part of the commentary relevant for our purpose is stated below (692 Quoted Objection (*akṣepavārttikam*)

kapi ca 4

kapi ca pratiṣedho vaktavyaḥ   bahukumārīkaḥ bahuvṛṣalīkaḥ

Tr: In the case of *kap* also the prohibition (of the shortening of the final long vowel) be stated, (as in the case of) *bahukumārīkaḥ, bahuvṛṣalīkaḥ*.

Note: During the process of compound formation *bahu + Jas kumārī + Jas* there is a possibility of the introduction of a *samāsānta* suffix *kaP*, by the *sūtra nadyrtaśca* (A5.4.153). There is also a possibility of the shortening of the final

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38.   MBh A2.4.30 (II.480.6)

vowel *ī*, by the *sūtra gostriyorupasarjanasya* (A1.2.48). However, in the presence of *kap* vowel shortening in such cases should be prohibited. On this *Bhāsyakāra* comments

(694 Quoted Answer (*samādhānavārttikam*))

> *uktam vā | kimuktam?¦ kapi tāvaduktaṁ - "na kapi" iti*
> *pratiṣedhaḥ- iti|*
>
> *(nirākaraṇabhāsyam)*
> *naitadastyuktam ¦ ke'ṇaḥ iti yā hrasvaprāptistasyāḥ pratiṣedha*
> *iti| kuta etat?¦ anantarasya vidhirvā bhavati pratiṣedho vā iti ||*
> *avaśyaṃ caitadevaṃ vijñeyam | yo hi manyate yā ca yāvatī va*
> *hrasvaprāptistasyāḥ sarvasyāḥ pratiṣedha iti, ihāpi tasya*
> *pratiṣedhaḥ prasajyeta- priyaṃ grāmaṇi brāhmaṇa kulamasya*
> *priyagrāmaṇikaḥ, priyasenānikaḥ ||*

Tr: It (The prohibition of the vowel shortening in the above mentioned cases) is already mentioned. What is mentioned? *na kapi* (A7.4.14), states the prohibition (of shortening of the final long vowel, when it is followed by a suffix *kap*). It (the prohibition of in the presence of the affix *kap*) is not stated. The prohibition of the vowel shortening that is possible due to the *sūtra ke'ṇaḥ* (A7.4.13) is stated. On what basis? A rule either prescribes or prohibits only that which is nearest to it. This should definitely be accepted. (Otherwise) If one accepts the applicability of the shortening of the vowel at all places then in the example *priyagrāmaṇikaḥ* also the prohibition would be affected. The paraphrase of *priyagrāmaṇikaḥ* is *priyaṃgrāmaṇi brāhmaṇakulam asya*. The component *grāmaṇi* in the paraphrase is neuter because of the coreferential word *brāhmaṇakulam*. Hence, the short vowel replacement that could apply here is by *hrasvo napuṃsake prātipadikasya* (A1.2.47).

Note: Here the argument is that, there is no necessity of the *vārttika* '*kapi ca*', on the ground that the *sūtra* '*na kapi*' (A7.4.14) already provides such a prohibition. But this argument is ruled out on the ground that the prohibition or prescription is always with respect to the nearest rule, and thus '*na kapi*' (A7.4.14) prohibits its previous rule *ke'ṇaḥ* (A7.4.13) and not any *sūtra*. If it were not so,

then '*na kapi*' (A7.4.14) would have prohibited the shortening of the long vowel in the case of *priyagrāmaṇikaḥ* as well. But as we notice that the shortening of the vowel does not happen in *priyagrāmaṇikaḥ*, one must accept that *na kapi* (A7.4.14) prohibits only *ke'ṇaḥ* (A7.4.13) and as such, we do require the *vārttika* '*kapi ca*'.

Now *Bhāṣyakāra* presents another argument against the necessity of the *vārttika*. The argument goes like this

> *(uktyantarabhāsyam)*
> *idaṃ tarhyuktam - 'kapi kṛte anantyatvād hrasvatvaṃ na*
> *bhaviṣyati"ːɪ idamiha sampradhāryaṃ - kap kriyatām,*
> *hrasvatvamiti ɪ kimatra kartavyaṃ ? ˌ paratvāt kap ˌ antaraṅgaṃ*
> *hrasvatvam ˌ antaraṅgataraḥ kap*

Tr: Then one may state this: after the addition of *kap* suffix the long vowel would not be in the final position and hence, there is no possibility of its shortening. Here it is to be decided: introduction of *kap* suffix or the shortening of the final vowel? Which one will take precedence? (Since the *sūtra* introducing *kap* *nadyṛtaśca* (A5.4.153) is later in the *Aṣṭādhyāyī* than the *sūtra* *gostriyorupasar-janasya* (A1.2.48) resulting in the vowel shortening, following *vipratiṣedhe paraṃ kāryam* (A1.4.2)) *kap* should be introduced first. (On the other hand,) the vowel shortening operation is internally conditioned. (Following the *paribhāṣā asiddhaṃ bahiraṅgamantaraṅge* vowel shortening takes precedence). (The introduction of the suffix) *kap* is intensly internally conditioned (*antaraṅgatara = prakarṣeṇa antaraṅga*). But this *kap* is called a *samāsānta*. (Thus it is externally conditioned. How can it be intensly internally conditioned?)

Objection *(ākṣepabhāṣyam)*

na cāyaṃ kap samāsānta ityucyate

Objection Rejected *(ākṣepabādhakabhāṣyam)*

tādarthyāttācchabdyaṃ bhaviṣyati yeṣām padānām samāsaḥ na tāvattesāmanyadbhavati kapaṃ tāvat pratīkṣate

The maxim is 'the use of a word x (to refer to y) on account of (y), being for

the sake of the item denoted by x. The *alaukikavigraha* which is going to get a label *samāsa* will not undergo any operation till the *samāsānta* affix (in this case *kap*) is introduced.

Note: Here the basic argument is after the introduction of the affix *kap* the long vowel is no longer the final one, and hence there would not be shortening of the long vowel, and hence there is no need to state the *vārttika kapi ca*. But then the main question is on what basis the conflict between the introduction of *kap* and the shortening of vowel is resolved? The introduction of *kap* is by the *sūtra nadyṛtaśca* (A5.4.153), while the shortening of the long vowel is by the *sūtra gostriyorupasarjanasya* (A1.2.48), and hence on the basis of *vipratiṣedhe paraṃ kāryaṃ* (A1.4.2) the introduction of *kap* is preferred over the vowel shortening. However there is another way of resolving the conflict, based on the conditions causing the operations. On this basis, the vowel shortening being internally conditioned should take precedence over the introduction of the *samāsānta* affix which is externally conditioned. However, *Bhāṣyakāra* argues that the introduction of *samāsānta* affix is not externally conditioned, rather it is intensly internally conditioned. In support of this he quotes a maxim *tādarthyāttācchabdyaṃ bhaviṣyati*. The word *samāsa* in *samāsānta* refers to the *alaukikavigrahavākya* which is going to get a label *samāsa*. And till the *samāsānta* affix is introduced (at the end of the *samāsa* which refers to *alaukikavigraha*) other operations pertaining to compound formation will not take place. Therefore the introduction of *samāsānta* is intensly internally conditioned, and only after this other operations will resume.

On this *Udyotakāra Nageśa* comments as :

samāsaśabdena tadarthamuttarapadaṃ lakṣyata iti bhāva iti
kaścit vastutastu samāsārthaṃ. vigrahavakyam lakṣyata iti
bhāṣyāśayastathaivānyatra dṛṣṭatvāt[39]

Tr: Some argue that the term *samāsa* in the *sūtra samāsāntāḥ* refers to the subsequent component. However, in reality, the intension of the *Bhāṣyakāra* as observed at other places is that the term *samāsa* refers to the *alaukikavigrahavākya*.

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39. MBh A1.2.48 (I.57)

Similarly, in the commentary on the *Praudhamanoramā*, we note the following observation under the commentary on *samāsāntāḥ* (A5.4.68).

> *evañcālaukikavigrahavākye samāsasaṁjñā samakālameva*
> *samāsānta iti siddhāntaḥ*[40] |

Tr: Therefore the finally established opinion is in the *alaukikavigrahavākya* the introduction of *samāsānta* affix and the assignment of the label *samāsa* take place simultaneously.

6 CONCLUSION

Based on the above discussions we conclude that the *samāsānta* suffix is a part of an analytical paraphrase (*alaukikavigraha*) only, and the *alaukikavigraha* along with the *samāsānta* suffix gets the designation *samāsa*. Dīkṣita's view on *samāsānta* suffix as a part of an *uttarapada* is not acceptable. The reason being lack of any evidence (*pramāṇa*) that tells us the word *samāsa* in *samāsānta* as an *uttarapada*. Dīkṣita has extended the meaning of the word *samāsa* in *samāsānta* as an *uttarapada* by *lakṣaṇā* to explain the correct forms such as *dvipurī, dvidhurī* etc. In the *Mahābhāṣya*, nowhere do we find any support for this explanation. Now one may wonder, what does Patañjali has to say about the forms such as *dvipurī* etc. Patañjali rejects the *vārttika akārāntottarapado dviguḥ striyām bhāṣyataḥ iti vaktavyam*, because in the *sūtra dvigoḥ* (A4.1.21) he says that the feminine suffix is added to the entire *dvigu* compound ending in *a*. So, there is no need to consider the suffix *a* to be part of an *uttarapada* following the *vārttika*. In conclusion, the *samāsānta* suffix is a part of the analytical paraphrase only.

Thus the generation process of the compounds, which is inferred from the traditional commentators viz. Patañjali and Nageśa, starts with the *alaukikavigraha*, then *samāsāntā* suffix is added to it. The whole string now gets the designation *samāsa* and such a *samāsa* gets the designation *prātipadika*. This is followed by the *aluk* related operations(in case of *aluk* compounds). Then assignment of the label *upasarjana* and consequent placement as prior or subsequent constituent take place. At this point, entities called *samāsānta* come into effect. There follow

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40   PMa (A5.4.68) (I:578)

operations on prior constituents *pūrvapadākārya*, subsequent constituents *uttarapadakārya*, word operations *padakārya*, and phonological operations that apply at junctures *sandhikārya*; finally, the gender, number and accent of the newly formed lexeme are decided and an appropriate case ending is added to get the compound. Figure 4 shows this process of the generation of Sanskrit compounds. This process has been implemented computationally, and the software is available for access at http://sanskrit.uohyd.ac.in/scl → tools → Compound Generation
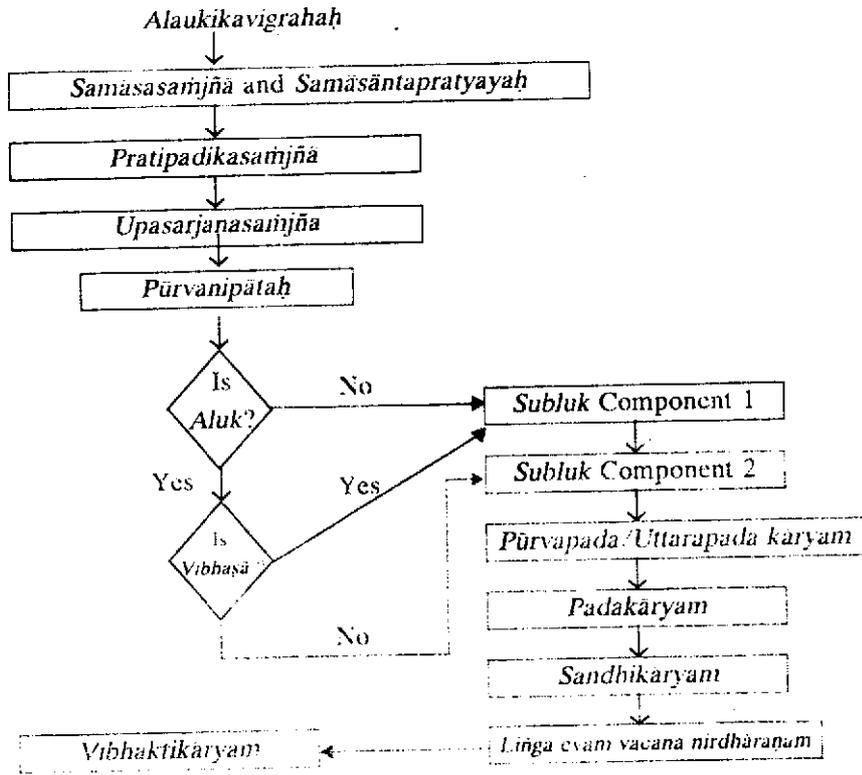

Figure 4 : Process of Compound Generation (2)

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