# Annotating Sanskrit Texts based on Śābdabodha systems

K. V. Ramkrishnamacharyulu

Rastriya Sanskrit Vidyapeetham, Tirupati, India

## 1 वन्दनम्

श्री रामो विजयतेतराम् । श्री रामाय नमः । श्री गुरुभ्यो नमः । श्रीमद्रामानुजाय नमः ।

## 2 Introduction

Though Sanskrit has a huge repository of texts as well as well discussed grammar formalism, we still neither have a full fledged parser for Sanskrit based on this formalism nor do we have any annotated text.

We propose here a tagging scheme for manual tagging of Sanskrit texts, based on different grammatical relations that have been discussed by different schools of śābdabodha systems. We hope the tagging scheme proposed here serves as a good starting point for manual annotation.

The process of Śābdabodha involves identifying the relations between different words in a sentence. The traditional model of sentence analysis which is mainly based on Pāṇinian model provides us with various relations that are mainly Syntactico-Semantic in nature. Tradition treats a sentence as a series of modifier-modified relations(M.M.R.). *Ākāṅkṣā* (expectancy) plays a major role in establishing these relations.

Sentence is a group of words that are bound together by ākāṅkṣā. Sentences are of two types: vākya (simple sentence) and mahā-vākya (complex sentence).

Vākya is a group of words with one verb. Other words in the sentence satisfy the ākāṅkṣās (expectancies) of the main verb. These ākāṅkṣās are called utthita ākāṅkṣā(Natural expectancies). The main verb is the mukhya viśeṣya (head) which is modified by other words (modifiers) in the sentence.

Mahā vākya is a group of sentences which are inter-related and denote a single meaning. Here the head of the main sentence is modified by the heads of the other (subordinate) sentences. As such the relations between the main verb of the main sentence and the main verbs in sub-ordinate sentences denote

the inter-sentential relations. The ākāṅkṣā between the activities i.e. heads of the sentences is not natural but are triggered by special words in the sentence construction. These ākāṅkṣās, therefore, are called *utthāpyākāṅkṣā*.

The relations, thus, are of two types: external relations - relations between sentences and internal relations - relations between words within the sentences.

In what follows, we list different inter-sentential and intra-sentential relations. We indicate, wherever possible, the marker which helps in identifying these relations, semantics associated with these relations, language conventions associated with them, if any, followed by the proposed tag[1] with an example sentence.

## 3 Proposed Tagset

### 3.1 Inter-sentential relations

These relations are denoted by certain link words and non-finite verb forms. The ākāṅkṣā between two sentences is known only if the link words are present in the sentence. All such relations are marked by (...)_R where (...) denotes the part of the sentence, R is the inter-sentential relation. The inter-sentential relations may be further subclassified as

1. Relations denoted by non-finite verbs
2. Relations denoted by certain link words

**Relations denoted by Non-finite verbs**

1. पूर्वकालीनत्वम् (pūrvakālīnatvam)
   liṅgam: ktvā ending non-finite verb form
   Meaning: ktvā- ending verb form denotes the activity which preceeds an activity denoted by the main verb.
   Properties: The kartā of the ktvā ending verb is shared with that of the main verb[2].
   Proposed tag: (...)_ktvā
   Example: (रामः दुग्धं पीत्वा)_ktvā शालां गच्छति) ।
   (rāmaḥ (dugdhaṁ pītvā)_ktvā śālāṁ gacchati).

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[1] Though technically name of the relation should end in the bhāva pratyaya 'tva' as in 'kartṛtva', 'karmatva' etc., since we tag the words, we tag them as 'kartā', 'karma', etc.
Thus in the sentence
रामः गृहं गच्छति । (rāmaḥ gṛhaṁ gacchati),
rāma has kart.rtva of the kriyā denoted by *gam*, but we tag it as
रामः_kartā गृहं गच्छति । (rāmaḥ_kartā gṛhaṁ gacchati)

[2] समानकर्तृकयोः पूर्वकाले 3.4.21, (samānakartṛkayoḥ pūrvakāle)

2. प्रयोजनम् (purpose of the main activity)
   liṅgam: tumun-ending nonfinite verb form
   Meaning: The tumun-ending verb denotes the purpose of the main activity
   Properties: The kartā is shared in some cases. In some cases the karma or
   sampradāna of the main activity becomes the kartā of the purpose activity.
   proposed tag: (...)_tumun
   Example: (अहं प्रतिदिनं (योगशास्त्रं पठितुं)_tumun विद्यालयं गच्छामि) ।
   (aham pratidinaṃ (yogaśāstraṃ paṭhituṃ)_tumun vidyālayaṃ gacchāmi).
   (अहं भवन्तं मम गृहे (भोक्तुम्)_tumun आह्वयामि) ।
   (ahaṃ bhavantaṃ mama gṛhe (bhoktum)_tumun āhvayāmi).

3. समकालीनत्वम् (Simultaneity)
   liṅgam: śatṛ or śānac
   Meaning: It denotes the activity occuring simultaneously with the main verb
   Properties: The kartā is shared with the main activity
   proposed tag: (...)_śatṛ/(...)_śānac
   Example: (बालकः (जलं पिबन्)_śatṛ गच्छति) ।
   (bālakaḥ (jalaṃ piban)_śatṛ gacchati).
   (बालकः (शयानः)_śānac हसति) ।
   (bālakaḥ (śayānaḥ)_śānac hasati).

4. भावलक्षणसप्तमी (bhāvalakṣāṇa saptamī)

   – अनन्तरकालिकत्वम् (Time of the completion of preceeding activity)
     liṅgam: kta - ending in $7^{th}$ case
     proposed tag: (...)_$kta_7$
     Example: ((रामे वनं गते)_$kta_7$ दशरथः खिन्नः) ।
     ((rāme vanaṃ gate)_$kta_7$ daśarathaḥ khinnaḥ).

   – समकालीनत्वम् (simultaneous events)
     liṅgam: śatṛ or śānac - ending in $7^{th}$ case
     propsed tag: (...)_$śatṛ_7$
     Example: ((रामे वनं गच्छति)_$śatṛ_7$ सीता अनुसरति) ।
     (rāme vanaṃ gacchati)_$śatṛ_7$ sītā anusarati.

   – पूर्वकालीनत्वम् (time of the main activity before the starting of the sub-
     ordinate activity)
     liṅgam: lṛṭ + śatṛ or śānac ending in $7^{th}$ case
     Proposed tag: (...)_lṛṭ-$śatṛ_7$
     Example: ((गोषु धोक्ष्यमाणासु)_lṛṭ-$śatṛ_7$ गतः) ।
     ((goṣu dhokṣyamāṇāsu)_lṛṭ-$śatṛ_7$ gataḥ).

**Relations denoted by words**

1. समानकालीनत्वम् (samānakālīnatvam)

   – liṅgam: yadā - tadā or yasmin kāle - tasmin kāle
   yadā or yasmin kāle in the subordinate sentence typically in the beginning and tadā or tasmin kāle in the beginning of the main sentence
   proposed tag: (...)_yadā$_1$
   Example: (तदा मयूरः नृत्यति (यदा मेघः वर्षति)_yadā$_1$) ।
   (tadā mayūraḥ nṛtyati (yadā meghaḥ varṣati)_yadā$_1$)

   – liṅgam: yadā or yasmin kāle
   Only yadā or yasmin kāle is present, and tadā or tasmin kāle is absent.
   proposed tag: (...)_yadā$_2$
   Example: (मयूरः नृत्यति (यदा मेघः वर्षति)_yadā$_2$) ।
   (mayūraḥ nṛtyati (yadā meghaḥ varṣati)_yadā$_2$)

   – liṅgam: tadā or tasmin kāle
   Only tadā or tasmin kāle is present, and yadā or yasmin kāle is absent.
   proposed tag: (...)_tadā
   Example: (मेघः वर्षति (तदा मयूरः नृत्यति)_tadā) ।
   (meghaḥ varṣati (tadā mayūraḥ nṛtyati)_tadā)

2. प्रतिबन्धः (conditional relation)

   – liṅgam: yadi - tarhi
   'yadi' in the beginning of a subordinate sentence and 'tarhi' in the main sentence;
   proposed tag: (...)_yadi$_1$
   Example: ((यदि त्वम् इच्छसि)_yadi$_1$ तर्हि अहं भवतः गृहम् आगच्छामि) ।
   ((yadi tvam icchasi)_yadi$_1$ tarhi ahaṁ bhavataḥ gṛham āgacchāmi).

   – liṅgam: yadi
   Only yadi is used,
   proposed tag: (...)_yadi$_2$
   Example: (अहम् आगमिष्यामि (यदि भवान् अपेक्षितं सौलभ्यं विधास्यति)_yadi$_2$) ।
   (aham āgamiṣyāmi (yadi bhavān apekṣitaṁ saulabhyaṁ vidhāsyati)_yadi$_2$).

   – liṅgam: tarhi
   Only 'tarhi' is used, and the word 'yadi' is missing. proposed tag (...)_tarhi
   Example: (त्वम् इच्छसि (तर्हि अहं भवतः गृहम् आगच्छामि)_tarhi) ।
   (tvam icchasi (tarhi ahaṁ bhavataḥ gṛham āgacchāmi)_tarhi).

   – liṅgam: cet
   presence of the word 'cet' proposed tag: (...)_cet
   Example: ((त्वम् इच्छसि चेत्)_cet अहं भवतः गृहम् आगच्छामि) ।
   ((tvam icchasi cet)_cet ahaṁ bhavataḥ gṛham āgacchāmi).

– liṅgam: tarhi eva
group the words from the beginning up to tarhi_eva as one sentence, and the rest as second sentence
proposed tag: (...)_tarhi_eva
Example: ((त्वम् इच्छसि तर्हि एव)_tarhi_eva अहं भवतः गृहम् आगच्छामि) ।
((tvam icchasi tarhi eva)_tarhi_eva ahaṁ bhavataḥ gṛham āgacchāmi)).

3. कारणसत्वेऽपि कार्याभावः, कारणाभावेऽपि कार्योत्पत्तिः (Non productive effort (or) product without cause)

– liṅgam: yadyapi – tathāpi
proposed tag (...)_yadyapi$_1$
Example: ((यद्यपि अयं बहु प्रयासं कृतवान्)_yadyapi$_1$ तथापि परीक्षा तु अनुत्तीर्णा) ।
((yadyapi ayaṁ bahu prayāsaṁ kṛtavān)_yadyapi$_1$ tathāpi parīkṣā tu anuttīrṇā)

– liṅgam: yadyapi
Example: ((यद्यपि अनेन बहु प्रयासः कृतः)_yadyapi$_2$ परीक्षा तु अनुत्तीर्णा) ।
((yadyapi anena bahu prayāsaḥ kṛtaḥ)_yadyapi$_2$ parīkṣā tu anuttīrṇā).

– liṅgam: tathāpi proposed tag (...)_tathāpi
Example: (अयं तथा न कुशलः (तथापि प्रथमपुरस्कारं लब्धवान्)_tathāpi) ।
(ayaṁ tathā na kuśalaḥ (tathāpi prathamapuraskāraṁ labdhavān)_tathāpi)

– liṅgam: athāpi or evamapi
proposed tag (...)_athāpi
Example: (परीक्षायाम् अहम् अनुत्तीर्णः (अथापि पुनः लिखिष्ये)_athāpi) ।
parīkṣāyām aham anuttīrṇḥ (athāpi punaḥ likhiṣye)_athāpi)

4. हेतुहेतुमद्भावः (cause and effect)

– liṅgam: yataḥ-tataḥ or yasmāt-tasmāt
proposed tag (...)_yataḥ$_1$
Example: ((यतः अयं समये नागतः)_yataḥ1 ततः प्रवेशपरीक्षायां नानुमतः) ।
((yataḥ ayaṁ samaye nāgataḥ)_yataḥ1 tata.h praveśaparīkṣāyā.m nānumataḥ)

– liṅgam: yataḥ or yasmāt
proposed tag (...)_yataḥ$_2$
Example: (प्रवेशपरीक्षायां नानुमतः अयं (यतः समये नागतः)_yataḥ$_2$) ।
(praveśaparīkṣāyāṁ nānumataḥ ayaṁ (yataḥ samaye nāgataḥ)_yataḥ$_2$)

– liṅgam: tataḥ or tasmāt or ataḥ
proposed tag (...)_tataḥ

Example: (अयं समये नागतः (ततः अयं परीक्षायां नानुमतः)_tataḥ) ।
(ayaṃ samaye nāgataḥ tataḥ ayaṃ parīkṣāyāṃ nānumataḥ)

5. अनन्तरकालीनत्वम् (following action)
   liṅgam: tataḥ or tatastataḥ or anantaram or atha
   proposed tag: (...)_atha
   Example: (प्रथमम् अहं शृणोमि (अथ लिखामि)_atha) ।
   (prathamam ahaṃ śṛṇomi (atha likhāmi)_atha)

6. समुच्चयः (conjunction)
   liṅgam: api_ca or kiṃ_ca
   proposed tag (...)_apica
   Example: (भिक्षाम् अट (अपिच गामानय)_apica) ।
   (bhikṣām aṭa (apica gāmānaya)_apica)

7. समानाधिकरणत्वम् (co-location)
   – liṅgam: yatra - tatra or yasmin - tasmin
     proposed tag: (...)_yatra₁
     Example: ((यत्र नार्यस्तु पूज्यन्ते)_yatra₁ रमन्ते तत्र देवताः) ।
     ((yatra nāryastu pūjyante)_yatra₁ ramante tatra devatāḥ)

   – liṅgam: yatra or yasmin
     proposed tag: (...)_yatra₂
     (अहो बृन्दावनं रम्यं (यत्र गोवर्धनो गिरिः)_yatra₂) ।
     (aho bṛndāvanaṃ ramyaṃ (yatra govardhano giriḥ)_yatra₂)

   – liṅgam: tatra or tasmin
     proposed tag: (...)_tatra
     Example: ((तत्र स्नात्वा नरो राजन्)_tatra गोसहस्रफलं लभेत) ।
     ((tatra snātvā naro rājan)_tatra gosahasraphalaṃ labheta)

8. असाफल्यम् (non-fulfilment of expected activity)
   liṅgam: kintu or parantu
   proposed tag (...)_kintu
   Example: (गजेन्द्रः तीव्रप्रयत्नम् अकरोत् (किन्तु नक्रग्रहात् न मुक्तः)_kintu) ।
   (gajendraḥ tīvraprayatnam akarot (kintu nakragrahāt na muktaḥ)_kintu)

## 4  Sentence Internal relations

These are of two types

– related to the words denoting activity,
– related to other words

## 4.1 Relations related to the activity-denoting words

These relations are triggered by the vibhaktis. However one vibhakti may indicate several relations. It is the context which indicates a particular relation. we mark these relations by REL where REL stands for the relation label.
These relations are also of two types:

– kāraka relations
– non-kāraka relations

– kāraka relations
  - kartā $k_1$
  - karma $k_2$
  - karaṇa $k_3$
  - sampradāna $k_4$
  - apādāna $k_5$
  - adhikaraṇa $k_7$

These kāraka relations may also be further classified as

- **कर्ता (kartā)** $(k_1)$

  * default $(k_1)$
    देवदत्तः_$k_1$ पचति ।
    devadattaḥ_$k_1$ pacati
    रथः_$k_1$ गच्छति ।
    rathaḥ_$k_1$ gacchati

  * अनुभवी (experiencer($k_1$-e)
    Example: घटो_$k_1$-e नश्यति ।
    ghaṭo_$k_1$-e naśyati.
    पुत्रः_$k_1$-e जायते ।
    putraḥ_$k_1$-e jāyate.
    सः_$k_1$-e सुखम् अनुभवति ।
    saḥ_$k_1$-e sukham anubhavati.

  * अमूर्तः (abstract) $(k_1$-a )
    Example: क्रोधः_$k_1$-a आगच्छति ।
    krodhaḥ_$k_1$-a āgacchati.

  * प्रयोजकः (prayojakaḥ) $(k_1$-p)
    देवदत्तः_$k_1$-p विष्णुमित्रेण पाचयति ।
    (devadattaḥ_$k_1$-p viṣṇumitreṇa pācayati.

  * प्रयोज्यः (prayojyaḥ) $(k_1$-j)
    देवदत्तः विष्णुमित्रेण_$k_1$-j पाचयति ।
    devadattaḥ viṣṇumitreṇa_$k_1$-j pācayati.

* मध्यस्थः (madhyasthaḥ) ($k_1$-m)
  देवदत्तः यज्ञदत्तेन _$k_1$-m विष्णुमित्रेण पाचयति ।
  devadattaḥ (yajñadattena) _$k_1$-m viṣṇumitreṇa pācayati.

* अभिप्रेरकः/उत्प्रेरकः (cause for temptation) ($k_1$-t)
  Example: मोदकः _$k_1$-t रोचते ।
  modakaḥ _$k_1$-t rocate.

* कर्म-कर्तृ (karma-kartṛ) ($k_1$-$k_2$)
  Example: भिद्यते काष्ठः _$k_1$-$k_2$ स्वयमेव ।
  bhidyate kāṣṭhaḥ _$k_1$-$k_2$ svayameva.
  पच्यते ओदनः _$k_1$-$k_2$ स्वयमेव ।
  pacyate odanaḥ _$k_1$-$k_2$ svayameva.

* करण-कर्तृ (karaṇa-kartṛ) ($k_1$-$k_3$)
  Example: असिः _$k_1$-$k_3$ छिनत्ति ।
  asiḥ _$k_1$-$k_3$ chinatti.

* षष्ठी - कर्ता (ṣaṣṭhī kartā) (K1-6)
  Example: आचार्यस्य _$k_1$-6 अनुशासनम् ।
  ācāryasya _$k_1$-6 anuśāsanam.

• **कर्म (karma)** ($k_2$)
  * default ($k_2$)
    Example: शत्रून् _$k_2$ जयति ।
    śatrūn _$k_2$ jayati.
    ओदनं _$k_2$ भुङ्क्ते ।
    odanaṃ _$k_2$ bhuṅkte.

  * उत्पाद्यम् (created)($k_2$-u)
    Example: ओदनं _$k_2$-u पचति ।
    odanam _$k_2$-u pacati.

  * विकार्यम् (raw meterial)($k_2$-v)
    Example: सुवर्णं _$k_2$-v कुण्डलं करोति ।
    suvarṇam _$k_2$-v kuṇḍalaṃ karoti.

  * प्रयोज्य-कर्ता (prayojya-kartā) ($k_2$-j)
    Example: बालं _$k_2$-j क्षीरं पाययति ।
    bālaṃ _$k_2$-j kṣīraṃ pāyayati.

  * आधारः (location) ($k_2$-l)
    Example: वैकुण्ठम् _$k_2$-l अधिशेते ।
    vaikuṇṭham _$k_2$-l adhiśete.

* देशः (village, town, state, country etc) ($k_2$-p)
  Example: कुरून्_$k_2$-p स्वपिति ।
  kurūn_$k_2$-p svapiti.

* कालः (time) ($k_2$-t)
  Example: मासम्_$k_2$-t आस्ते ।
  māsam_$k_2$-t āste.

* भावः (activity) ($k_2$-a)
  Example: गोदोहम्_$k_2$-a आस्ते ।
  godoham_$k_2$-a āste.

* मार्गः (road measurment) ($k_2$-m)
  Example: क्रोशम्_$k_2$-m आस्ते ।
  krośam_$k_2$-m āste.

* सम्प्रदानम् (recipient) ($k_2$-$k_4$)
  Example: पशुना रुद्रं_$k_2$-$k_4$ यजते ।
  paśunā rudraṃ_$k_2$-$k_4$ yajate.

* अनीप्सितम् (not intended) ($k_2$-an)
  Example: ग्रामं गच्छन् तृणं_$k_2$-an स्पृशति ।
  grāmaṃ gacchan tṛṇaṃ_$k_2$-an spṛśati.

* अकथितम् (not expected) ($k_2$-un)
  Example: गोपः गां_$k_2$-un दोग्धि पयः ।
  gopaḥ gāṃ_$k_2$-un dogdhi payaḥ

* गति-कर्म (gati-karma) ($k_2$-g)
  Example: रामः ग्रामं_$k_2$-g गच्छति ।
  rāmaḥ grāmaṃ_$k_2$-g gacchati.

* करणम् (instruments of playing) ($k_2$-$k_3$)
  Example: अक्षान्_$k_2$-$k_3$ दीव्यति ।
  akṣān_$k_2$-$k_3$ dīvyati.
  कन्दुकं_$k_2$-$k_3$ क्रीडति ।
  kandukaṃ_$k_2$-$k_3$ krīḍati.

* यं प्रति कोपः (yaṃ prati kopaḥ) ($k_2$-k)
  Example: क्रूरम्_$k_2$-k अभिक्रुध्यति ।
  krūram_$k_2$-k abhikrudhyati.

* मन्य-कर्म (in disrespect) ($k_2$-d)
  Example: न त्वां तृणाय_$k_2$-d / तृणं_$k_2$-d मन्ये ।

na tvāṃ tṛṇāya$_k_2$-d / tṛṇam$_k_2$-d manye.

* षष्ठी-कर्म (ṣaṣṭhī-karma) ($k_2$-6)
  Example: शब्दानाम्$_k_2$-6 अनुशासनम् ।
  śabdānām$_k_2$-6 anuśāsanam.

- करणम् (instrument) ($k_3$)

  * default ($k_3$)
    बालः कुञ्चिकया तालम् उद्घाटयति ।
    bālaḥ kuñcikayā tālam udghāṭayati.

  * कर्म (karma) ($k_3$-$k_2$)
    Example: पशुना$_k_3$-$k_2$ रुद्रं यजते ।
    paśunā$_k_3$-$k_2$ rudraṃ yajate.

  * परिक्रयणम् (money in bonded labour) ($k_3$-m)
    Example: शतेन$_k_3$-m परिक्रीणाति ।
    śatena$_k_3$-m parikrīṇāti.

- सम्प्रदानम् (recipient) ($k_4$)

  * सत्वाश्रयः (recipient with ownership) ($k_4$-o)
    देवदत्तः ब्राह्मणाय$_k_4$-o गां ददाति ।
    devadattaḥ brāhmaṇāya$_k_4$-o gāṃ dadāti.

  * स्वीकर्ता (recipient without ownership) ($k_4$)
    देवदत्तः रजकाय$_k_4$-o वस्त्रं प्रक्षालनाय ददाति ।
    devadattaḥ rajakāya$_k_4$-o vastraṃ prakṣālanāya dadāti.

  * क्रियया अभिप्रेतः (intended to relate with activity) ($k_4$-i)
    example: पत्ये$_k_4$-i शेते ।
    patye$_k_4$-i śete.

  * श्लीप्स्यमानः (addressed through praise etc.) ($k_4$-a)
    example: कृष्णाय$_k_4$-a श्लाघते ।
    kṛṣṇāya$_k_4$-a ślāghate.

  * उत्तमर्णः (a creditor) ($k_4$-u)
    example: देवदत्ताय$_k_4$-u शतं धारयति ।
    devadattāya$_k_4$-u śataṃ dhārayati.

  * ईप्सितम् (desired) ($k_4$-d)
    Example: पुष्पेभ्यः$_k_4$-d स्पृहयति ।
    puṣpebhyaḥ$_k_4$-d spṛhayati.

* यं प्रति कोपः सः (point of anger) ($k_4$-k)
  Example: हरये_$k_4$-k क्रुध्यति ।
  haraye_$k_4$-k krudhyati.

* प्रीयमाणः (location of desire) ($k_4$-p)
  Example: देवदत्ताय_$k_4$-p रोचते मोदकः ।
  devadattāya_$k_4$-p rocate modakaḥ

* यस्य विप्रश्नः (enquiry about) ($k_4$-e)
  Example:- कृष्णाय_$k_4$-e राध्यति ।
  kṛṣṇāya_$k_4$-e rādhyati.

* परिक्रयणम् (money in bonded labour) ($k_4$-b)
  Example: देवदत्तः शताय_$k_4$-b परिक्रीतः ।
  devadattaḥ śatāya_$k_4$-b parikrītaḥ

- अपादानम् (apādānam) ($k_5$)

  * default (point of departure/seperation) ($k_5$)
    वृक्षात्_$k_5$ पर्णं पतति ।
    vṛkṣāt_$k_5$ parṇaṃ patati.

  * भय - हेतुः (cause of fear) ($k_5$-f)
    Example: गृहस्थः चोरात्_$k_5$-f बिभेति ।
    gṛhasthaḥ corāt_$k_5$-f bibheti.

  * आख्यात - उपयोगे (teacher) ($k_5$-u)
    Example: छात्रः उपाध्यायात्_$k_5$-u अधीते ।
    chātraḥ upādhyāyāt_$k_5$-u adhīte.

  * यस्मात् वारणम्(point for obstruction) ($k_5$-o)
    Example: कूपात्_$k_5$-o अन्धं वारयति ।
    kūpāt_$k_5$-o andhaṃ vārayati.

  * यस्य / यस्या अदर्शनम् इष्टं सः / सा (person intended not to be seen)
    ($k_5$-n)
    Example: मातुः_$k_5$-n निलीयते कृष्णः ।
    mātuḥ_$k_5$-n nilīyate kṛṣṇaḥ

  * प्रकृतिः (raw material) ($k_5$-p)
    Example: मृदः_$k_5$-p घटः जायते ।
    mṛdaḥ_$k_5$-p ghaṭaḥ jāyate.

  * प्रभवः (place of first appeerence) ($k_5$-a)
    Example: हिमवतः_$k_5$-a गङ्गा प्रभवति ।

himavataḥ $k_5$-a gaṅgā prabhavati.

* पराजयः (defeat from activity)[3] ($k_5$-d)
  Example: अध्ययनात्_$k_5$-d पराजयते ।
  adhyayanāt_$k_5$-d parājayate.

- अधिकरणम् (location) ($k_7$)
  * कालः (time) ($k_7$-t)
    Example: त्रेतायुगे_$k_7$-t रामः आसीत् ।
    tretāyuge_$k_7$-t rāmaḥ āsīt.

  * देशः deśaḥ (place) ($k_7$-p)
    Example: रामः आयोध्यायाम्_$k_7$-p आसीत् ।
    rāmaḥ āyodhyāyām_$k_7$-p āsīt.

  * विषयः viṣayaḥ (other than above) ($k_7$-v)
    Example: मोक्षे_$k_7$-v इच्छा अस्ति ।
    mokṣe_$k_7$-v icchā asti.

  * समयस्य अवधिः (time duration) ($k_7$-td)
    Example: जनवरीतः_$k_5$-a (मई पर्यन्तं)_$k_7$-td विरामः ।
    janavarītaḥ_$k_5$-a (maī paryantaṁ)_$k_7$-td virāmaḥ.

  * अन्तराल-देशः (place in between) ($k_7$-pd)
    Example: तिरुपतितः_$k_5$-a चन्द्रगिरिपर्यन्तं_$k_7$-td भवनानि सन्ति ।
    tirupatitaḥ_$k_5$-a candragiriparyantaṁ_$k_7$-td bhavanāni santi.

– अकारकसम्बन्धः साक्षात् क्रियया (Non kāraka relations, but direct relations with the activity)

- सम्बोधनम् (addressed) (radr)
  Example: भो राम_radr माम् उद्धर ।
  bho rāma_radr mām uddhara.

- प्रसज्यप्रतिषेधः (uncompounded negation) (rneg)
  Example: रामः गृहं न_rneg गच्छति ।
  rāmaḥ gṛhaṁ na_rneg gacchati.

- साम्यम् (similarity) (rs)
  Example: ब्राह्मणवत्_rs अधीते ।
  brāhmaṇavat_rs adhīte.

- क्रिया - आवृत्त्यन्तरालसमयः (time duration between the repetition of the same activity) (rtd)

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[3] पराजेः असोढः parājeḥ asoḍhaḥ 1.4.26

Example: अद्य भुक्त्वा दिनद्वयात्_rtd भोक्ता ।
adya bhuktvā dinadvayāt_rtd bhoktā.

- तादर्थ्य (purpose) (rtv)
Example: छात्रः अध्ययनाय_rtv विद्यालये वसति ।
chātraḥ adhyayanāya_rtv vidyālaye vasati.
सा क्रयणाय_rtv आपणं गच्छति
sā krayaṇāya_rtv āpaṇaṃ gacchati.

- हेतुः (cause) (rhv)
Example: विद्यार्थी अध्ययनेन_rhv विद्यालये वसति ।
vidyārthī adhyayanena_rhv vidyālaye vasati.

- वीप्सा (repitition) (rrpt)
Example: शकुन्तला आश्रमे प्रतिवृक्षं_rrpt सिञ्चति ।
śakuntalā āśrame prativr̥kṣaṃ_rrpt siñcati.

- क्रिया-आवृत्ति-गणना (counting of repetition) (rcrpt)
Example: बालकः पाठं पञ्चवारं_rcrpt पठति ।
bālakaḥ pāṭhaṃ pañcavāraṃ_rcrpt paṭhati.

- क्रियाविशेषणम् (manner adverb) (rad)
Example: हस्ती मार्गे मन्दं_rad गच्छति ।
hastī mārge mandaṃ_rad gacchati.
मृगः वेगेन_rad धावति ।
mr̥gaḥ (vegena)_rad dhāvati.

- अत्यन्त-सम्बद्धः कालः (complete relation with time) (rt2)
Example: बालकः गुरुकुले मासम्_rt2 अधीतः ।
bālakaḥ gurukule māsam_rt2 adhītaḥ

- अत्यन्त-सम्बद्धः मार्गः (complete relation with road) (rr2)
Example: पाठः क्रोशम्_rr2 अधीतः ।
pāṭhaḥ krośam_rr2 adhītaḥ

- अत्यन्त-सम्बद्धः कालः (प्रयोजनः) सफलः (complete relation with time with result) (rt3)
Example: बालकेन मासेन_rt3 अनुवाकः अधीतः ।
bālakena māsena_rt3 anuvākaḥ adhītaḥ.

- अत्यन्त-सम्बद्धः मार्गः (प्रयोजनः) सफलः (complete relation with road with result) (rr3)
बालकेन क्रोशेन_rr3 अनुवाकः अधीतः ।
bālakena krośena_rr3 anuvākaḥ adhīta.h.

- Other Relations

- षष्ठी (ṣaṣṭhī relation) (r6)
  (अध्यापकस्य)_r6 पुस्तकं छात्राः पठन्ति ।
  adhyāpakasya_r6 pustakaṃ chātrāḥ paṭhanti.

- आरम्भसमयः मापने (starting point of time) (rst5)
  Example: कार्तिक्याः_rst5 आग्रहायणी मासे ।
  kārtikyāḥ_rst5 āgrahāyaṇī māse.

- आरम्भदेशः मापने (starting point of place) (rsp5)
  Example: तिरुपतितः_rsp5 चन्द्रगिरिः क्रोशे ।
  tirupatitaḥ_rsp5 candragiriḥ krośe.

- लक्षणम् (point of direction) (rd)
  Example: वृक्षं प्रति_rd विद्योतते विद्युत् ।
  vṛkṣaṃ prati_rd vidyotate vidyut.
  पक्षी भवनस्य उपरि_rd डयते ।
  pakṣī bhavanasya upari_rd dayate.
  रामः ग्रामं प्रति_rd गतः ।
  rāmaḥ grāmaṃ prati_rd गतः ।

- तादर्थ्य (purpose) (rt)
  Example: बालकाय_rta पुस्तकं क्रीणाति ।
  bālakāya_rt pustakaṃ krīṇāti.

- हेतुः hetuḥ (rh)
  Example: कुम्भकारः दण्डेन_rh घटं करोति ।
  kumbhakāraḥ daṇḍena_rh ghaṭaṃ karoti.

- सह सम्बन्धः (associative) (ras)
  (पुत्रेण सह)_ras पिता गच्छति ।
  (putreṇa saha)_ras pitā gacchati.

- विना (non-associative) (rnas)
  (धर्मेण विना)_rnas जीवनं नास्ति ।
  (dharmeṇa vinā)_rnas jīvanaṃ nāsti.

- विभक्तः (comparison between two) (rv5)
  माथुराः पाटलीपुत्रकेभ्यः_rv5 आढ्यतराः ।
  māthurāḥ pāṭalīputrakebhyaḥ_rv5 āḍhyatarāḥ

- निर्धारणम् (Isolating one from a group – in the superlative degree context)
  (rn7 / rn6).
  गवां_rn7 कृष्णा बहुक्षीरा ।
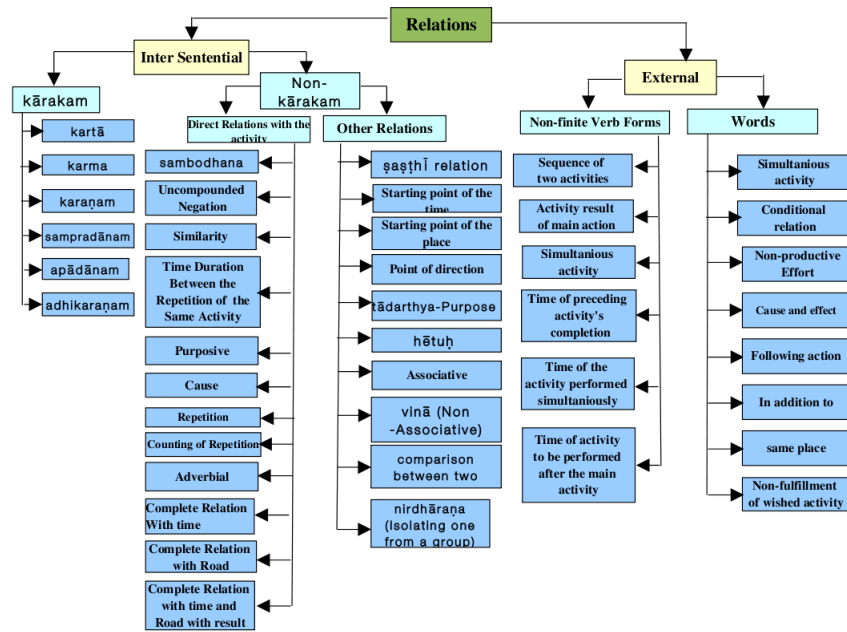  gavāṃ_rn7 kṛṣṇā bahukṣīrā
  गोषु_rn6 कृष्णा बहुक्षीरा ।

goṣu rn6 kṛṣṇā bahukṣīrā

# 5 Appendix



**Fig. 1.** Relations in anvaya-prakriyā