Beyond Smoke and Fire: Towards Developing New Tools For Teaching *Anumāna*

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Abstract

This paper presents a few novel teaching tools for teaching *Anumāna*. A major difference between teaching Greek Logic (or Modern Logic) and *Anumāna* is that there are several teaching tools, in the form of examples and practice problems, for the former. On the other hand, for teaching *Anumāna*, the same traditional examples are being used *ad nauseam*. This presents a major problem in teaching *Anumāna* especially to a contemporary audience and also to non-*darśana*/non-philosophy students. There is a need for more relatable examples and problems so that students can analyse and evaluate an *Anumāna* just as they do so when learning Greek or Modern Logic. This will help them acquire greater clarity about the concepts involved in *Anumāna*. Further, with growing interest in Indian Knowledge Traditions and with Philosophy electives being offered at school level, it is necessary to develop innovative teaching tools which can cater to such needs. This paper hopes to be a step in that direction.

Keywords: Anumana, Logic, Vyapti, Philosophy teaching

Introduction

This paper aims to be a contribution to philosophy teaching (or *darśana*[2] teaching) rather than a philosophical paper. It is

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motivated by the following two avenues open to graduates of Philosophy.

Firstly, there is now an increasing interest in the Indian Knowledge Traditions and attempts are being made to introduce them at the school level. The All India Council for Technical Education (under the Ministry of Education) has also launched a new cell called Indian Knowledge System[3] to preserve and promote research in traditional disciplines. The National Education Policy 2020 (NEP) also mentions the inclusion of 'knowledge of India' in school curriculum. It adds that "An engaging course on Indian Knowledge Systems will also be available to students in secondary school as an elective" (NEP p.16). The model examples and problems suggested in this paper will help in the development of suitable study material for such courses. Secondly, with a spurt of liberal arts universities opening up in the country (and also with the increase of IITs) Philosophy graduates must prepare for the possibility that they will be teaching non-philosophy students (students whose major is not Philosophy).

For both these reasons there is a need to develop new tools for teaching Indian Philosophy in general. One of the important tools that a teacher uses in the class are examples and exercises. Neither the school student nor the student majoring in a non-philosophy discipline may appreciate or even understand traditional examples used to teach Indian Philosophy and there are hardly any exercise books available at the disposal of the teacher at that level.

This paper attempts to fill this gap by focusing on the topic *Anumāna* and proposes certain novel examples and model exercises which can be used while teaching students. A major

2 The word 'philosophy' is used to refer to both Philosophy and *Darśana*. The author is aware of the conceptual and methodological differences between the two and does this only for the sake of ease of reading.

3 Their page can be accessed at https://iksindia.org/

difference between teaching Greek or Modern Logic and *Anumāna* is that there are several teaching tools, in the form of examples and practice problems, for the former. On the other hand, for teaching *Anumāna*, the same traditional examples are being used *ad nauseam.* In our experience[4] of teaching *Anumāna*, the example of smoke-and-fire is so pervasive that after the topic has been taught, if a student is asked "What is *anumāna?*" they are very likely to just say "smoke and fire" rather than explaining it conceptually!

The Class XI textbook for Philosophy (Bhatt, 2011) demonstrates the real need for developing such exercises. We would like to state categorically that the intention in taking this book as an example is only to save ourselves from the possible charge of arguing against a straw man or of filling a need which does not exist. It will be noticed that in general there is a theoretical bent to the exercise problems given at the end of the chapter. However, relatively, the chapters on Greek Logic and Modern Logic (Unit 7, 8, 9) are ably aided by several practice problems. On the other hand, the chapter of *Anumāna* (Unit 10) is effectively bereft of this advantage. Even when the examples are used, they are the traditional ones. This has two undesirable side-effects. Firstly, the students, because of not being able to relate to these examples, may not understand the concept sufficiently. Secondly, since only traditional examples are given, students may think that this model of inference is only of historical value and may not see its current relevance. This, in turn, prompts the student to ask the question which many teachers dread to hear "Why should I learn this?"

It is not only this pragmatic gap which the current paper wishes to fill. We contend that the ability to generate new examples is a testament to how well one has understood a concept. Further, it also helps us to understand the limits of a particular

4 I am deeply indebted to Dr. K E Gopala Desikan with whom I co-taught the course *Logic and Argumentation* and co-developed these examples.

concept (i.e. if we are unable to give a variety of examples, it is indicative that the theory has limited applicability). With *anumāna* particularly, the additional advantage is that since this inference pattern is very frequent, almost ubiquitous, in all pre-modern philosophical literature in Sanskrit irrespective of the *śāstra*, a good grasp of *anumāna* will help the students pursuing higher studies in *Vedānta* or *Mīmāṃsā*, *Vyākaraṇa* or *Alaṅkāraśāstra*.

With this brief background, we would now like to present certain model exercises which can be used to teach *Anumāna*.

Model Problems For Teaching *Anumāna*

The key concepts involved in *Anumāna* are the following: *Hetu*, *Sādhya*, *Pakṣa*, *Vyāpti* and *Hetvābhāsa* (which is useful in evaluating an *Anumāna*). The following model problems and examples have been designed to help the student understand the above concepts in a step-by-step manner. Firstly, the student should become familiar with the basic components of an *anumāna* which are *hetu*, *pakṣa* and *sādhya*. Analogous to how students studying Aristotelean syllogism are given exercises to identify the middle term, major term and minor term, teachers can give exercises to identify the *hetu*, *pakṣa* and *sādhya* by using the following examples:

Model Problem 1: Identify *Hetu*, *Pakṣa* and *Sādhya*

1. Since the product is a convenience product, our pricing should be low.
2. X occupies space because of being in time.
3. A triangle is a polygon since it is a 3-sided closed figure
4. Oh don't worry! Covid-19 cannot survive in India because of our tropical climate.
5. As we see, people are consuming more rice during lockdown inspite of its increasing prices. This shows that it is a giffen good.

6. Look at that open drain! No wonder we had an outbreak of dengue here.

Note that at this point we don't have to worry about whether it is a good *anumāna* or not. Students can also be given problem of the converse nature. That is, provide the *pakṣa*, *sādhya* and *hetu* and ask them to construct the *anumāna*. For example:

Model Problem 2: Formulate the *Anumāna* using the following as *hetu*, *pakṣa* and *sādhya*

1. *Pakṣa*: Chemical 'X', *Sādhya*: Acidic , *Hetu*: Turns blue litmus red
2. *Pakṣa*: Light, *Sādhya*: Wave, *Hetu*: produces inference patterns
3. *Pakṣa*: Human beings, *Sādhya*: Mammals, *Hetu*: have vertebrate
4. *Pakṣa*: Airavata[5], *Sadhya*: conceivable, *Hetu*: possible

Once the students are used to these 3 basic elements, we can now proceed to the heart of the *anumāna* scheme – the *vyāpti*. Using the same examples as given above, the student can now be asked to formulate both *anvaya vyāpti* and *vyatireka vyāpti* for those inferences.

The *anvaya vyāpti* would be of the form: 'Wherever there is *hetu* there is *sādhya.*'

The *vyatireka vyāpti* would be of the form: 'Wherever there is no *sādhya* there is no *hetu.*'

However, the crucial aspect of the *vyāpti* statement is that it must include an example. This is the key difference between the universal proposition in Modern logic and *Anumāna*, in that the latter assumes that the generalization uses non-empty classes (in

5 Indra's elephant.

more technical language, there is an assumption of the existential import). Hence, when asking the student to formulate the statement of *vyāpti*, they must be asked to furnish a suitable example.

This has an addition advantage as follows: firstly, it can help then decide whether it is a good *anumāna* (if it is conditional, *sopadhika hetu*, then it is unlikely to serve as an *vyāpti*). Secondly, they will be able to decide if this is *kevānvayi hetu* (where they are not able to give *vyatireka vyāpti*) or *kevalavyatireki hetu* (where they are not able to give *anvaya vyāpti*) or *anvayavyatireki*. Thirdly, it can help them identify *hetuvābhāsa* if any. For example, if they are not able to furnish both positive or negative example, it means that there is neither *sapkṣa* nor *vipakṣa*, thereby committing the fallacy called '*asādhāraṇa vyabhicāra*.'

Model Problem 3: Formulate the *vyāpti* statement in the following case. For each, decide whether only *anvyavyāpti* is possible, *vyātirekavyāpti* is possible or both are possible.

1. Look at that open drain! No wonder we had an outbreak of dengue here.
2. Some philosophical thought-streams believe that Brahman alone is Real. They argue that everything else is unreal since it is ever changing.
3. Words, being nothing but an ordered collection of sounds, are eternal.
4. Mahabharata is a sacred text because it was authored by Vyāsa

They can also be given problems of the following type: Assume the following *vyāpti* "Whatever has mass cannot travel at the speed of light, like a chair." Assume that muons travel at speed of light. What can you conclude about their mass?

Once the students have mastered the identification of *hetu*, *pakṣa* and *sādhya,* the formulation of *vyāpti,* they can now be

asked to put all these together to construct the standard *pañcāvayava anumāna.*

Model Problem 4: Set out the following in the standard form of an *anumāna*.

1. According to some philosophical thought-streams, whatever is nameable is also knowable. Based on this they argue that God is knowable. Set out this argument in the form of an *anumāna*.
2. Every metal expands on heating.And contracts on cooling. That is why rail tracks change their dimensions in different seasons.
3. A triangle is a polygon since it is a 3-sided closed figure
4. India is a democracy since it has a population of more than 10 million.
5. Boxing should be banned since it is a form of violence for entertainment.

After these steps, comes the task of evaluating an *anumāna*. Just like students of Informal Logic are given exercises to identify fallacies, here too, we can give practice arguments to the students to identify the *hetvābhāsa*.

Model Problem 5: Identifying *Hetvābhāsa*

1. Rama is not a bachelor. Because of being married to Sita. (Assume Rama and Sita to be the characters of Ramayana.)
2. We know that the Veda-s are authored because they are a collection of sentences
3. Ravi is a bachelor because he is married. (Assume that Ravi is indeed married)
4. Light is a wave because it produces inference patterns.
5. Kochi is the capital of Kerala because of having the highest population density among all cities in Kerala. (Assume that Kochi indeed has the highest population density among all cities in Kerala).
6. Superman is a plant because he derives energy from the sun.

7. A crow can fly because it is a bird.

Conclusion

In general, teaching philosophy is a problem which requires the attention of existing academicians and research scholars who are planning to take up teaching. Further, teaching philosophy at non-university level and/or to non-philosophy students requires even more specialized attention. The problem is accentuated in the case of Indian Philosophy because of the language barrier, and also because of being seen as a historical artefact. This paper is an attempt at addressing this need and it does so by taking the topic, *Anumāna*. We have highlighted the lack of problems and exercises for teaching Anumāna and have tried to fill this lacuna by providing new examples and model exercises. There is further scope for developing such examples and practice problems for other concepts in Indian logic like *chala*, *jāti*, *nigrahasthāna*, *pūrvavat*, *śeśavat* and *sāmānyatodṛṣṭa anumāna*.

One of the most prominent philosophers of the 20th century, M.Hiriyanna said that the job of Indian philosophers is to interpret the classical texts, not to make them "attractive or agreeable — but only quite intelligible to those that for one reason or another have no direct access to old Indian thought" (*The Study of Indian Philosophy* in Hiriyanna 1972, p.113) We hope that the tools suggested in this paper makes *Anumāna* more intelligible to a diverse set of students eager to study Indian logic.

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