Chapter 13
Gandhi's *Satya*: Truth Entails Peace

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Abstract What is Gandhi's *satya*? How does truth entail peace? *Satya* or truth, for Gandhi, is experiential. The experiential truth of Gandhi does not exclude epistemological, metaphysical, or moral facets of truth, but is an unequivocal acknowledgement of the subjective basis of the pursuit of objectivity. In admitting my truth, your truth, our truth, their truth, etc., Gandhi brought into clear focus the reality of I and we—the subjects (or viewpoints) of subjective experiences (views). The totality of these subjective viewpoints, along with their mutual relationships, constitutes an objective frame of reference for reconciling or putting together seemingly irreconcilable perceptions into a unitary whole of mutual understanding and an ever more refined comprehension of reality, thereby engendering peace. Considering the generality of the basic tenet—viewpoint dependence of views—of Gandhi's *satyagraha* and in view of the kinship between positive conception of peace and unity, I put forward '*satyagraha* for science' as a method to address numerous foundational problems in various branches of science centred on unity such as the binding problem in neuroscience.

Keywords Gandhi · *Satya* · *Satyagraha* · Peace · Satyagraha for Science

Introduction

'Traffic light turned red', I alerted the cab driver, lest the driver was unaware of the change in the state-of-affairs of the world out there. I saw a traffic light turning red, which happens to correspond to the traffic light turning red, which, in turn, gave me the licence to treat my individual subjective perception of reality as the objective reality we all are collectively suspended in. This conflation of reality and its models is justified by its undeniable utility in our everyday transactions with reality (cf. things, thoughts, and people). However, it is a philosophical mistake to confuse objective reality with the subjective perception modelling it. The price we pay for this

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commonplace mistake is discounted self: subtraction of the self in transmuting "I see it *as* red" to 'it *is* red'. Although unmindful of (what Saint Augustine christened) 'the region of unlikeness' we inhabit, this mortal mistake is inconsequential unless, say, I see a circle and you see a rectangle, when we both look at one and the same thing. I claim that 'it is a circle' and you claim that 'it is a rectangle'. One thing cannot be two things. Hence, a problem: what is the truth? Or a conflict: who is right? But first, how do we go about deciding 'what is true' or 'who is right'? It is in this context of resolving differences that we find Gandhi's *satya*—experiential truth—as a proper conception of truth. Here I show how Gandhi's *satya*, in reconciling seemingly incompatible truths, entails peace. In the following, I begin with an explanation of Gandhi's *satya*. Equipped with Gandhi's experiential conceptualization of truth, along with the admission of attendant subjectivity, I substantiate—based on a positive definition of PEACE as a state of unitary wholeness—the claim: truth entails peace. Gandhi's *satyagraha*—holding onto truth—a pathway to peace, in the light of its generality—different views can be united by relating underlying viewpoints—is also a pathway to solve problems of unity such as the binding problem, i.e., the problem of putting together colour and shape into the coloured-shapes populating our everyday experience in consciousness studies.

Before we get to the core of the chapter, a few terminological clarifications are in order. First, I use the word 'viewpoint' not only to denote a location in space from which a person views an object, but also as a stand-in for the self—entire enchilada of selves—autobiographical self, bodily self, cognitive self, conceptual self, ecological self, embodied self, emotional self, empirical self, experiential self, mental self, metaphysical self, moral self, narrative self, physical self, social self, spiritual self, transcendental self, etc. (see Gallagher, 2000). Also, a view (appearance, observation, perception, or subjective experience) is not only a view of an object, but is also [simultaneously] a view from a viewpoint (subject); as such appearances and observations are treated as perceptual experiences of a subject (see Albright, 1994, 2015). Furthermore, one might be able to step out of one's body (Altschuler & Ramachandran, 2007) or forced out (Kandel et al., 2000, p. 489), but not out of one's experience simply because of the primacy of experience (Posina, 2017), with experience subsuming cognition et al. (see Posina et al., 2017).

Gandhi's *Satya*

What is Gandhi's *satya* or truth? How did Gandhi conceptualize TRUTH? In Gandhi's own words, "truth is self-evident" (Gandhi, 1959, p. 10). First, let us ask: what is self-evident to all selves—to each self? That I am in excruciating pain is self-evident in my subjective experience of pounding headache; I need no brain scan to tell me that I am in pain. The sounds I hear, the scenes I see, the thoughts I think, and the emotions I feel are all self-evident in my subjective experience. Of course, there are many truths that are not self-evident. But, if the truth were to be self-evident, then it must be the truth of subjective experience. Thus, in Gandhi's conceptualization, truth is experiential (see

also Bilgrami, 2003). Even more importantly, the subject of subjective experiences (or viewpoint of observations) is integral to Gandhi's conception of truth: "It has been my experience that I am always true from my point of view" (Gandhi, 1955, p. 12). This [seemingly] nondescript observation of Gandhi has all the purchasing power we need to show that Gandhi's *satya*—experiential truth—entails peace.

Truth Entails Peace

Let us consider a conflict or disagreement familiar to all students of *Anekantavada* of Jainism, including Gandhi. It is the familiar story of blind men getting to know an elephant. Being blind, they try to figure out what an elephant is like by feeling it with their hands. The one who touched the elephant's ear asserted: elephant is like a plantain leaf, while the one who touched elephant's belly asserted: elephant is like a wall, while the one who touched the elephant's tail asserted: elephant is like a snake. Needless to note, they end up arguing which, not surprisingly, does not bring them any closer to the truth of what an elephant is like. How can we turn this futile argument into a fruitful pursuit of truth?

Gandhi claimed "to be a passionate seeker after Truth" (CWMG, 1958, pp. 230–231). So, let us imagine the blind men (seeking the truth about an elephant) as Gandhis, say: Tall Gandhi, Medium Gandhi, and Short Gandhi. The Tall Gandhi, upon touching the ear of the elephant, would say: I think elephant is like a plantain leaf, while the Medium Gandhi, upon touching the belly of the elephant, would say: I think elephant is like a wall, while the Short Gandhi, upon touching the tail of the elephant, would say: I think elephant is like a snake. In adding 'I think', [every] Gandhi transformed what would have otherwise been branded as subjectivity, which is rather removed from matters of truth and reality, into positional objectivity, with the position being the subject (I) of subjective experiences (see Sen, 1993). The totality of these subjects (Tall Gandhi, Medium Gandhi, and Short Gandhi) constitutes an objective system of coordinates to put together seemingly incompatible pieces of knowledge—plantain leaf, wall, and snake—into a unitary understanding, i.e., the elephant. The operation of putting together, which is a process of resolving arguments or conflicts, can be made more concrete with a simpler example. Consider a cylinder standing on its base; the front-view of which is rectangle, while the top-view is circle. Before we know, we have a conflict—rectangle *vs.* circle—if we discount the viewpoints. Once we incorporate the viewpoints, the two viewpoints together constitute a coordinate system within which we can put together the seemingly incompatible pieces of knowledge into a unitary understanding:

$$\text{Rectangle}_{\text{Front}-\text{view}} \text{ AND } \text{Circle}_{\text{Top}-\text{view}} = \text{ Cylinder}$$

In the present context, it is important to note that the notion of PEACE, engendered by resolving conflicts, is a positive definition of peace characterized by wholeness and unity, where all parts of the whole fit-together somewhat like the parts—eyes, nose,

mouth, ears, neck, hands, legs, etc.—of a body fit-together into the body (see Fiala, 2018). Peace, when understood as a unitary whole resulting from putting together all that fits together, which is determined by the totality of viewpoints, is synonymous with truth. By virtue of the reflexivity of entailment relation (Lawvere & Rosebrugh, 2003, p. 196), we conclude truth entails peace, which is in accord with Gandhi's assertion: "Truth is the end" (Gandhi, 1955, p. 37).

Satyagraha for Science

It is interesting to note that Gandhi's truth—subjectivity of the pursuit of objectivity—is reminiscent of the contemporary understanding of scientific practices seeking the unity of sciences, especially James Clerk Maxwell's doctrine-dependent differential visibility of phenomena (Lawvere, 2001) and F. William Lawvere's Functorial Semantics, wherein subjective generalization—abstract theories and concrete models—of objective particulars is determined by doctrines (Lawvere, 2004; see also Lawvere & Rosebrugh, 2003, pp. 14–15, 239–240; Lawvere & Schanuel, 2009, pp. 84–90, 180–182, 309). Here particulars, generals, and doctrines correspond to objects, subjective experiences (views), and subjects (viewpoints), respectively (Posina, 2020).

Oftentimes, parallels or analogies tend to be the basis for the development of methods, models, and theories. For example, in introducing category theory Lawvere and Schanuel (1997, p. xiii) discuss how analogies became methods: "they [categorical ideas] first appeared only as dimly perceived analogies between subjects. Since Eilenberg & MacLane (1945), when the notion of 'category' was first precisely formulated, these analogies have been sharpened and have become explicit ways in which one subject is transformed into another." Along these lines, Lawvere (2002, p. 1) notes: "I noticed the analogy between the triangle inequality and a categorical composition law. The categorical connection is sufficient to suggest a whole system of constructions and theorems appropriate for metric spaces!" Later, Lawvere (2005, p. 1) adds: "Rejecting the complacent description of that identification (of triangle inequality and composition law) as a mere analogy or amusement, its relentless pursuit is continued, revealing convexity and geodesics as concepts having a definite meaning over any closed category."

It is in this spirit, having noticed 'unity' in the positive conception of peace and having recognized the generality of *satyagraha* as a method to bring about peace, i.e., reconcile differences in views by relating the underlying different, in Gandhi's words, "angles of vision" (Gandhi, 1955, p. 64; see also ibid. p. 21; Gandhi, 1968, p. 107, 264, 311; Juergensmeyer, 2007), I put forward '*satyagraha* for science' as a method for pursuing, at various scales, unity in science.

Problems of unity or putting together are ubiquitous in science. For example, Albright et al., (2000, p. S2), upon summing up a century of neuroscience research, conclude: "the issue is whether we can succeed in developing new strategies for combining reductionist and holistic approaches in order to provide a meaningful

bridge between molecular mechanism and mental processes: a true molecular biology of cognition." In a similar vein, Carla Shatz, in charting a post-reductionist science, acknowledges: "the challenge now is how to put the molecules back into cells, and the cells back into the [neural] systems, and systems back into [brain] trying to really understand behaviour and perception" (Gershon, 2001). In physics, there are the problems of unifying classical and quantum mechanics and of unifying quantum mechanics and relativity theory.

In mathematics, there is the problem of unifying algebra, arithmetic, calculus, logic, and geometry. Note that these struggles for unification are no idle pursuits: unification allows one "to put the vast storehouse [of bits and pieces of knowledge] in order, and to find the appropriate tool when it is needed, so that the new ideas and methods collected and developed as one goes through life can find their appropriate places as well" (Lawvere & Schanuel, 1997, p. xiii). In fact, "the unification of mathematics is an important strategy for learning, developing, and using mathematics" (Lawvere & Schanuel, 2009, p. 378). The great geometer Charles Ehresmann cautioned: "without some unifying theory, the mathematicians would fatally tend to use divergent, incompatible languages, like the builders of the tower of Babel" (Ehresmann, 1966, p. 4). Ehresmann envisioned a mathematical education that recognizes unifying theory as fundamental: "theory of categories seems to be the most characteristic unifying trend in present day mathematics; for that reason, I think it will soon have to be taught at the university level like other fundamentals as early as linear algebra or topology" (ibid. p. 5). All the more important is the fact that "explicit use of the unity and cohesiveness of mathematics sparks the many particular processes whereby ignorance becomes knowledge" (Lawvere, 1991, p. 2). James Clerk Maxwell's Electromagnetic Field (Maxwell, 1865), in providing a unified account of electricity, magnetism, and light, is a stellar example of the significance of unification. More broadly, "Mathematics is the key for the understanding of the whole Universe, *unifying all human thinking*, from Sciences to Philosophy and Metaphysics. So, the great ideal of Plato and Leibniz, the ideal of Mathematics as the essence of all knowledge, might at last be attained" (Ehresmann, 1966, pp. 6–7, *emphasis mine*; see also Lawvere & Schanuel, 2009, p. 129).

A foundational problem of unification in neuroscience is the binding problem of putting together *qualitatively* different perceptual attributes (e.g., colour, shape) into the unity (coloured-shapes) of our conscious experience (Albright et al., 2000, pp. S36-S37; Brook & Raymont, 2017; Croner & Albright, 1999; Kandel et al., 2013, p. 368, 437, 447; Roskies, 1999). The problem is particularly difficult because we are fluent in putting together quantities (e.g., addition, multiplication), but not so much so in putting together *qualities*. Note that the unification we are seeking is an understanding of the unity of conscious experience: "binding of visual attributes is tantamount to their reaching the perceiver's awareness" (Albright et al., 2000, p. S37). For example, colours and shapes are unified in our conscious experience: every time we see a colour, it is the colour of a shape and every shape we see has a colour. An amusing quail-story in this context is: painters, envious of musicians, who readily produce pleasant sounds (music) without verbal meanings, sought to create visual music, i.e., pure colour devoid of shape. Unfortunately, no matter how and

what coloured paint painters splashed on a canvas, it always conveyed some shape to their chagrin, which they deftly labelled abstract painting (see Gage, 1993).

Returning to the problem of unification, the problem of putting together is not limited to visual domain: at the next level, we have the problem of combining *qualitatively* different perceptual modalities—visual, auditory, tactile, taste, and smell—into the unity of consciousness that we all experience (Albright et al., 2000, pp. S36-S37; Brook & Raymont, 2017; Croner & Albright, 1999; Kandel et al., 2013, p. 368, 437, 447; Roskies, 1999). Andrée Ehresmann and her colleagues developed a general mathematical framework: Memory Evolutive Systems (MES), wherein the problem of putting together or binding is modelled as colimit (which is a generalization of the more familiar operation of sum to accommodate putting together of structures along with their mutual relations; Ehresmann & Vanbremeersch, 2007, pp. 49–71). It is fascinating to note that, although MES was developed completely independent of *satyagraha*, the formation of colimit in MES as a solution to the binding problem is reminiscent of putting together different views into a unitary whole, by way of analysing views into views-viewpoints, as we discuss below. In MES, views and their underlying viewpoints are explicitly modelled as co-regulators and their underlying landscapes, with colimit of different partial views, i.e., co-regulators corresponding to different landscapes, resulting in unified conscious experience. Considering the generality of MES, it can be applied to problems of putting together at various scales beginning with atomic physics and going all the way to social conflicts and philosophical differences (Ehresmann, 2012; Ehresmann & Vanbremeersch, 2007, pp. 65–66, 79, 226, 230–231, 283; Ehresmann & Vanbremeersch, 2019).

Let us now examine the problem of putting together in detail. As I eat Tirupati Laddu, I experience the sweet taste, savour the mouth-watering aroma, see the pleasant yellow colour and round shape, feel the smooth indentations of the laddu on my fingertips and its soft granular texture in my mouth, and hear the barely audible sound of chewing not as discrete perceptual attributes suspended in some experiential void, but as a unitary whole. Now, the question is: what does Gandhi's *satyagraha* have to say about how *qualitatively* different vision, audition, touch, taste, and smell can all be put together into a unified conscious experience? Treating different perceptual attributes (e.g., yellow laddu) as different views from their respective viewpoints (eyes), we find that vision is a view from the viewpoint of eyes (or photoreceptors), touch is a view from the viewpoint of skin (mechanoreceptors), smell is a view from the viewpoint of nose (chemoreceptors), etc. (see Albright, 2015, p. 22, 38; Kandel et al., 2013, pp. 449–451). Going by our earlier experience with resolving different views—rectangle *vs.* circle—into the unity of cylinder by relating corresponding viewpoints: front-view and top-view, we realize that first the viewpoints—chemoreceptor, photoreceptor, and mechanoreceptor—need to be related to one another (recollect that it is the relation between front-view and top-view that determined the putting together of rectangle and circle into cylinder). Once we have a space of sensory transducers converting environmental energy, wherein the relations between chemical, light, and mechanical stimuli is specified enough to form an objective frame of reference (as in the case of front-view and top-view), then sights, sounds, smells, and tastes will all fall into place resulting in a unified

conscious percept (just as circle and rectangle combined into a circle as soon as we recognized circle as top-view and rectangle as front-view). Constructing a totality of *qualitatively* different types of stimuli (light, chemical, and mechanical) requires conceptualizing quantities with different physical units as categories (universes of discourse) of a Grothendieck-Cantor type of abstraction (Lawvere, 2003).

Admittedly, the programme of research we arrived at by applying the method of Gandhi's *satyagraha* to the binding problem is monumental (application of *satyagraha* was never easy and not meant for selfie-scientists; cf. Geman & Geman, 2016). Fortunately, students of consciousness studies are not all alone in struggling with *qualities*; we are in good company: "the core of mathematical theories is in the variation of quantity in space and in the emergence of *quality* within that" (Lawvere, 2014, p. 3 / 716, *emphasis mine*). Even more fortunately, the basic ingredients that we need—COHESION and QUALITY—have been axiomatized (Lawvere, 2007), which enables us to begin conceptualizing a category of *quality types*, wherein the mutual relations between *qualities* are specified, as a first step towards the objective reference frame of *qualitatively* different physical stimuli (viewpoints) that is needed to put together different perceptual attributes (views) into a unified conscious experience.

Let me now bring back our enlightening elephant. Peter Johnstone (University of Cambridge) named his magnum opus: *Sketches of an Elephant* (Johnstone, 2002). Here the elephant is a mathematical object called topos. One familiar example of topos is the topos of sets, where a set is a collection of elements (Lawvere & Rosebrugh, 2003, pp. 1–2). For example, Fruits = {banana, apple} is a set of two elements: banana and apple. Sets such as the just mentioned Fruits, along with functions between sets (a function f from the set Fruits to a set Colours = {yellow, red} is an assignment of an element in the set Colours to each element in the set Fruits; e.g., f (banana) = yellow and f (apple) = red) form a topos by virtue of the following properties that the category (mathematical universe of discourse) of sets and functions has: 1. There is an empty set {}, 2. There is a single-element set {•}, 3. Sum of sets is a set, 4. Product of sets is a set, 5. Totality of all functions from a set to a set is a set, and 6. There is a two-element truth value set {false, true} (ibid. pp. 111–113; Lawvere & Schanuel, 2009, pp. 13–18, 352–353). Once you abstract out these properties and call it a topos, then you will find that there are other mathematical universes of discourse (categories such as graphs and dynamical systems) that have these properties and hence are toposes. Before long you have one saying "topos is a space", another saying "topos is a theory", yet another saying "topos is a mathematical universe" and there is no stopping them sayings, all of which reminded Johnstone of our enlightening elephant: "topos resembles an elephant in that it is possible to come up with very different descriptions of what topos is, depending on the direction from which one approaches it" (Johnstone, 2002, p. vii; see also Sen, 1980). Application of Gandhi's *satyagraha* immediately suggests forming an objective reference frame of 'directions of approach' (viewpoints) to put together different [incomplete/partial] descriptions (views) into a complete picture of topos. Unfortunately, Johnstone, not having the aid of Gandhi's *satyagraha*, could not get the moral of our enlightening elephant story: "the important thing about the elephant is that 'however you approach it, it is

still the same animal'; this book is an attempt to demonstrate that the same is true of topos" (ibid. p. viii). The problem with Johnstone's self-comforting reading is that, however, Johnstone approaches it, it is still the same elephant, *but* depending on the direction Johnstone approaches it, Johnstone may find it to be a snake or a wall or a plantain leaf (as we discussed earlier); it's only by putting together these views by way of taking into account the underlying viewpoints that Johnstone may get to know that there is an elephant.

Concluding Remarks

Gandhi's *satya*, by virtue of being an experiential conceptualization of truth, undid the cardinal sin of cognition: treating subjective models of reality as reality. In doing so, Gandhi paved the way for peace by acknowledging the subjective nature of the pursuit of truth. This acknowledgement constitutes a method for resolving incompatible percepts into a mutually agreeable reality within the objective framework formed of the totality of contending subjects (viewpoints).

In light of the realization that Gandhi's oft-repeated claim: "the only means for the realization of Truth is *ahimsa*" (Gandhi, 1940, p. 615) is an assertion of the ontological determination of epistemology (Posina, 2016), along with the presently discussed Gandhi's experiential conceptualization of truth and the application of Gandhi's *satyagraha* to the foundational problems of unity in neuroscience and mathematics, one cannot help but cease to read the title of Gandhi's autobiography: *My Experiments with Truth* (Gandhi, 1940; here it is worth noting the etymological kinship between experience and experiment, which is planned perception) metaphorically and start recognizing Gandhi as a serious scientist. The genius of Gandhi that flowered in the field of science, in addition to blooming in metaphysical realm and blossoming in political arena, is a middle way paved in his thoughtful synthesis of Hindu absolutism with Jain *anekantavada* (Rao, 2017, p. 40; see also Gardner, 2011, pp. 289–330).

In closing, I address potential criticisms. One immediate criticism is the absence of *purva-paksha* or the contrary point of view. There is no engagement with any of the many well-established theories of truth. Yes, truth, as Gandhi recognized, "is as old as hills" (Gandhi, 1955, p. 7); naturally, there is no dearth of theories of truth. However, my objective here is to bring Gandhi's scientific genius into figural salience—for all to see. Not unlike beauty defined as figure-sans-background, Gandhi's experiential conception of truth needs no background of other theories to stand out. So is the case with peace. While contemporary peacebuilders think of truth as the first step in bringing about lasting peace (Tolbert, 2016), Gandhi's *satyagraha* was aeons ahead in realizing that we need to hold onto truth every step of our way towards peace (Gandhi, 1968). It is this incomparable genius of Gandhi that Einstein celebrates: "Generations to come, it may be, will scarce believe that such a one as this ever in flesh and blood walked upon this Earth" (Einstein, 1950, p. 240).

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Venkata Rayudu Posina is constructing a category of Reflecting, which is required, in addition to the familiar categories of Being and Becoming, to synthesize ontology and epistemology into which reality is analyzed.