TO CONSTRUCT AND TEST THE MULTI-COMPONENT TRAIT MODEL OF
PERSONALITY IN INDIAN PSYCHOLOGY

Submitted for the award of the degree of Doctor of Philosophy

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BY

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CERTIFICATE

This is to certify that the content in this Ph.D. thesis entitled ‘To Construct and Test the Multi-Component Trait Model of Personality in Indian Psychology’, is a bona fide record of independent research work done by Ms. Gitanjali Roy (Reg. No.: FoEdu./3/192) under my supervision and submitted to The Maharaja Sayajirao University of Baroda, Vadodara for the award of the Degree of Doctor of Philosophy. The results in the research have not been submitted elsewhere for the award of any degree or diploma. It is further stated that the doctoral research was carried out fulfilling the requisite attendance criteria as per O. Ph.D. 3 (i) of The Maharaja Sayajirao University of Baroda, Vadodara.

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ABSTRACT

As ecology and history shaped culture, any discussion of the roots and practices of a discipline like psychology needs to be couched in the historical context since the present emerges from the interaction between the past and the zeitgeist (Bhawuk, 2003a, 2005; Liu & Hilton, 2005; Triandis, 1994). It is important to do so because this would establish objectivity about the role of psychology in shaping our viewpoint and the knowledge that we create. Indian psychology has evolved from the epistemological field of Indian philosophy.

The present study, entitled “To test and construct the multi-component trait model of personality in Indian psychology”, makes an attempt to lay an objective eye on Indian Psychology, by identifying traits from *Triguna* and preparing a trait model of personality. The research began with an introduction of Indian psychology, Western and Indian perspectives on personality and related review of literature, followed by the rationale of the study, research objectives and questions. The conceptual framework of the Trait model of personality in Indian psychology and operational definitions of the traits incorporated in the study were mentioned ahead. For the empirical analysis of the conceptual trait model, a questionnaire was developed. The data was collected in two sets using this questionnaire. One set of data on 533 participants was analysed for descriptive statistics and exploratory factor analysis. The exploratory factor analysis revealed 11 factors of *Triguna* - *Sattvic* Knowledge, *Sattvic* spirituality, *Sattvic* habit, Tranquillity, Maturity, Emotional Stability, Empathy, *Tamasic* Knowledge, *Tamasic* habit, *Rajasic* Habit and Passion; with reliability ranging from 0.6 to 0.7. The 11 factor empirical model of personality in Indian psychology was subjected to confirmatory factor analysis through structural equation modelling. A second set of data on 1018 participants was collected for the same. The results of confirmatory factor analysis revealed a good model fit indices for 11-factor trait model of personality in Indian psychology. The questionnaire was standardized and norms were developed in form of stanine norms for general population, male and female group, and five professional groups (medical personnel, engineers, teaching professionals, administrative professionals and students pursuing

higher education). Personality profiles for males, females and of the above mentioned professional groups were generated as well. Conclusion and implications were drawn and mentioned in the end.

Keywords: Indian psychology, personality, trait model, exploratory factor analysis, structural equation modelling

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List of Abbreviations

AGFI - Adjusted Goodness of Fit

AMOS – Analysis of Moment Structures

ANOVA - Analysis of Variance

BG- *Srimad Bhagavad Gita*

CFA – Confirmatory Factor Analysis

CFI - Comparative Fit Index

CPI - Coping Strategy Inventory

EFA – Exploratory Factor Analysis

Em - Empathy

ES - Emotional Stability

GFI - Goodness Fit Index

GUVNL – Gujarat Urja Vikas Nigam Limited

M.P. – Madhya Pradesh

Ma - Maturity

MGVCL – Madhya Gujarat Vidhyut Company Limited

NFI - Normed Fit Index

OCB - Organizational Citizenship Behaviour

Pa - Passion

R1.1 - First trait and first item of *rajas guna* (similarly other traits and items of *rajas guna* should be encoded)

RG - *Rajas Guna*

RH - *Rajasic* Habit

RMSEA - Root Mean Square of Error Approximation

S.S.G. Hospital– Sir Sayajirao Gaekwad Hospital

SRT-TRAIT MODEL OF PERSONALITY IN INDIAN PSYCHOLOGY

S1.1 – First trait and first item of *sattva guna* (similarly other traits and items of *sattva guna* should be encoded)

SEM – Structural Equation Modelling

SG - *Sattva Guna*

SH - *Sattvic* Habit

SK- *Sattvic* Knowledge

SPSS - Statistical Package for Social Sciences

SRT – *Sattva, Rajas* and *Tamas*

SS - *Sattvic* Spirituality

STAS - State - Trait Anger Scale

T1.1 - First trait and first item of *tamas guna* (similarly other traits and items of *tamas guna* should be encoded)

TG - *Tamas Guna*

TH - *Tamasic* Habit

TK- *Tamasic* Knowledge

TLI - Tucker-Lewis index

Tr - Tranquillity

Tukey's HSD – Tukey's Highest Significant difference

VPI – Vedic Personality Inventory

From the time when man stepped in the age of civilization and science, he has made continuous attempts to explore and understand his nature and utilized this knowledge to improve his quality of life. This process soon made him realize that understanding one's nature was incomplete without an understanding of one's own self. This realization made him confront a formidable problem- "Who am I?" In the West, early attempts to understand a man were adapted from philosophical ideas and knowledge from natural sciences. Later, natural sciences and philosophies found different paths to explain the complexities of human behaviour, because merely explaining human nature through objective methods by physical and natural elements seemed incomplete. Terms like soul, mind, intuitive and empathic approaches etc. have emerged for explaining human nature, and this trend of thinking led to the emergence of psychology (Beena, 1990). Modern psychology takes this journey forward under the prime concept of personality. In modern times, one can see two leading perspectives of psychology, the Western psychology and the Indian psychology. Given below is a discussion on personality from both these perspectives.

1.1 Personality in Western psychology

The word 'personality' was derived from the Latin word 'persona' which referred to a mask used by actors in a play. It implied personality as an outward appearance of a person. The study of personality takes us back to a long history of elite philosophers of Greece and Rome, who proposed different personality theories. Modern theorists to a large extent echo the theories and approaches set forth by these thinkers. For example, Plato in 390 BCE saw human soul as seat of personality, whereas Alexander referred psyche as seat of personality. Human personality was viewed as a product of the interaction of divine and primal forces by Descartes (2009). In disparity with Descartes, Machiavelli believed that personality was best understood in social

context. Their ideas revealed compelling insights into the human psyche (Ellis, Abrams & Abrams, 2009). The meaning of personality extended far beyond the “superficial social image” concept and referred to something more essential and enduring about a person. Personality was not merely an outer appearance, it was something that influenced one’s thinking, feeling and behaviour.

The need to formulate specific and testable theories was vital in personality psychology and thus scholars moved from descriptive accounts of personality to specific theories and models (Ellis, Abrams & Abrams, 2009). Since the 4th century, Western psychology had witnessed six major approaches (psychoanalysis, behaviourism, humanistic, cognitive, type and trait approach), with numerous theories and different viewpoints to understand personality. These viewpoints indicated personality as a study of conscious and unconscious mind, behaviour analyses, and structure of the mind, needs, traits and types. All of these viewpoints provided a picture of the personality but from different angles.

The discussion of personality begins with the classic type theory of personality suggested by Hippocrates, an ancient Greek philosopher in 460 BC, in which he illustrated that every individual had four types of body fluids or four humours that discriminated people into four types. These four body fluids were –blood, yellow bile, black bile and phlegm and four types of people based on these fluids were happy, unhappy, temperamental and apathetic. This four humour theory gave rise to the concept of four temperaments of personality with different characteristic features: sanguine, melancholic, choleric and phlegmatic. This was one of the earliest theories of type approach. Later in the 19th century, Sigmund Freud, the founder of psychoanalytic approach, accentuated on biological drives like sex and aggression, conscious and unconscious mind and unavoidable conflicts in early childhood as

significant factors in the development of personality. He considered the conscious mind as a limited aspect of personality as it had only a small portion of one's thoughts, sensation and memories. He described it as the tip of an iceberg.

Conceivably, he gave more importance to the unconscious as it is a larger portion of the iceberg that was vast and the home to instincts, wishes and desires that directed behaviour of an individual. In 1923, he introduced id, ego and superego as three basic structures of personality, in which the Id was the reservoir of instincts and libido (the psychic energy manifested by instincts) and different functions to reduce tension by increasing pleasure. The ego tried to postpone, delay or redirect Id impulses and operated on the reality principle. The third structure, i.e. the superego contained the unconscious set of beliefs about right and wrong which were acquired during childhood and worked on morality principle. Rescinding Freud's concept of personality Carl Jung developed the analytical psychology on significant points that differed from psychoanalysis. Firstly, he redefined libido as a general life energy and not just restricted to sex. Secondly, he argued that human beings were not just victims of past events, but human personality was shaped by both childhood experiences in the past and future aspirations. And finally, he laid greater emphasis on unconscious so much that his personality theory revolved around unconscious. He probed more deeply into the unconscious, combined ideas from history, mythology, anthropology, and religion to form an image of human nature and added a new dimension: the inherited experiences of human and pre-human species. In a nutshell, Jung's theory focused on the inner growth of the individual rather than relationships with other people. In contrast, Freud's theory was concerned more with intra-psychic and effects of past experiences on the present (Schultz & Schultz, 2009). In Jung's view, the total personality was composed of distinct systems, namely ego, personal unconscious and

the collective unconscious and these systems influenced one another. He proposed eight psychological types of personalities based on the interactions of two attitudes (extroversion and introversion) and four functions (sensation, thinking, feeling, and intuition): extraverted thinking, extraverted feeling, extraverted sensing, extraverted intuiting, introverted thinking, introverted feeling, introverted sensing and introverted intuiting (Schultz & Schultz, 2009). Alfred Adler denied biological motives and role of sex given by Freud and established his approach 'Individual Psychology' that drew attention to the uniqueness of personalities. In his opinion personalities were shaped by social environments and interactions, and not by biological needs. He believed that attempts to overcome inferiority feelings (1938/1956), fictional finalism, and style of life, creative power and order of birth were motivating forces in behaviour and determinants to bring uniqueness in personalities. Henry Murray gave a variation to personality approaches by including the concept of needs to explain motivation and direction of behaviour. He explained need as physiochemical forces in the brain that organised and directed perceptual abilities and these forces may have arisen from internal processes such as hunger, thirst or any environmental events (Schultz & Schultz, 2009). He listed twenty needs that impelled behaviour and explained them in detail in his theory. A different explanation of personality development was brought into light by Erik Erikson in which he claimed eight psychosocial stages of life i.e. from birth to death with a series of personal conflicts. Maladaptive or adaptive responses to these conflicts resulted in the making of personality. Adams (1954) suggested that by examining our purposes whenever we use 'I', a good idea of personality can be attained. This 'I' was a summation of our likes and dislikes, fears and virtues, strengths and weaknesses. It separated one individual from all others (Schultz & Schultz, 2009).

Besides type theories and psychoanalysis, other traditional approaches to personality were behavioural, cognitive and social. The behaviouristic approach contained theories of learning or behaviour by E. Thorndike, Ivon Pavlov, John Watson and B.F. Skinner, which explained personality. Their theories postulated personality as conditioned behaviour that responded in specific ways to specific stimuli and with stimuli, personalities and behaviours can be systematized and controlled. Thorndike proposed that animals and human beings learned behaviour through association of a stimuli and a response. Pavlov's classical conditioning has been one of the ground breaking work to study behaviour. John Watson posited that human beings responded to rewards and punishments. With every reward a desirable behaviour was learned and with every punishment an undesirable behaviour was unlearned. Another eminent scholar, Albert Bandura (1999) proposed the social cognitive theory of personality which had observational learning, modelling, vicarious learning, and self-efficacy and reciprocal determinism as significant features. The social cognitive theory of Bandura (1991a) suggested the construction of moral standards - through cognitive processing, instructing moral precepts and evaluating reactions to meet ethical and moral significance. Beside these traditional approaches, a modern approach was pioneered by Abraham Maslow viz., Humanistic approach. He emphasised on psychological health, growth, virtues and potentials and criticised psychoanalysis. He claimed that Freud studied abnormal and emotionally disturbed people and by that ignored positive human qualities such as happiness, contentment and peace of mind (Maslow, 1970). According to him, the development of personality could be explained by a hierarchy of five innate needs and two meta-needs. Maslow (1968, 1970) suggested that this need hierarchy initiated and guided human behaviour. The five innate needs were: physiological needs, safety needs,

belongingness and love needs, esteem needs and self-actualization needs. The two meta-needs were: aesthetic needs and transcendental needs. Maslow suggested that an individual must satisfy needs from lower to higher levels in the hierarchy. Another humanistic theorist, Carl Roger (1961) adapted the values of the humanistic approach and viewed personality in terms of self, an organized, permanent, subjectively perceived entity which was at the very heart of all our experiences. He believed that humans have the ability, motivation and responsibility to understand and improve themselves and an innate tendency to grow and fulfil their potential. Based on this philosophy he made a framework for the patient-therapist relationship. He added to this approach an ultimate and necessary goal of life i.e., to become a fully functioning person. The desire to explore personality in more composite manner took scholars of the 20th century towards a newer approach.

The contemporary theorists of the 20th century, Gordon Allport and Raymond Cattell became the pioneers of trait approach to personality. They disagreed with the concept that a few instincts like sexual drive, striving for superiority, etc. motivated people, and were sufficient to define personality. Allport (1927) defined traits as distinguishing characteristics that guided behaviour and gave a few characteristics of traits – a) personality traits were real and existed within an individual; b) traits determined behaviour; c) traits can be measured empirically; d) traits were interrelated, even though they represent different characteristics; and e) traits may vary with the situation. Allport and Odbert (1936) adopted the lexical approach to identify personality traits. They listed 18,000 traits and processed them into three categories- cardinal, central and secondary traits. Raymond Cattell reduced the massive number of traits in Allport and Odbert's list to sixteen traits (Cattell, 1943) through a rigorous scientific approach called factor analysis. He labelled these 16

personality traits as source traits (Cattell, 1965) and defined them as basic structural units of personality. In other words, by assessing the range of these 16 traits in a person, the entire personality could be predicted.

Sculitz and Sculitz (2009) defined personality as those external and visible characteristics which other people were able to see. By external and visible characteristics, he meant the outward appearances of a person, the impressions made by him on others and characteristics displayed through behaviour like honesty, wisdom, wickedness, laziness etc. Morgan, King and Weisz (2004) stated that personality consisted of characteristics and distinctive ways of behaviour of an individual. By 'characteristics' he meant specific or unique behaviour and by 'distinctive' he meant discriminating between people. These elements were interdependent on each other. The characteristics helped in forming a psychological structure of an individual, which later governed every aspect of life such as learning, thinking etc. Weinberg and Gould (1999) suggested that personality was a blend of good and bad characteristics that made a person unique. An individual was able to attain success if good characteristics (like hard-working) were utilised to their maximum. Every view point above provided a comprehensive and rational understanding of pattern of human behaviour.

1.2. Determinants of personality

Besides the versatile explanations of personality, Indian and Western psychology have accepted determinants of personality as an important concept. Heredity, physical environment, culture, and life experiences were four broad and important determinants which would resolve the formation, development and maintenance of personality. Hereditary or genetic factor explained the innate personality

characteristics and influenced an individual's specific responses to specific stimulus.

According to Allport (1927), no feature of personality is devoid of hereditary influence. Mendel in his experiment on pea seeds proved inheritance of traits and the field of personality neuroscience rested on the premise that the whole person cannot be understood without understanding the brain (DeYoung, 2010). Personality traits like empathy, altruism, intelligence etc. (Deary, Johnson, & Houlihan, 2009; Johansen, 2015; Matthews, Batson, Horn, & Rosenman, 1981; Rushton, Fulker, Neale, Nias, & Eysenck, 1986) and personality types like *vatta*, *pitta*, *kapha* (Govindaraj, et al., 2015) have a hereditary base. Heredity thus stayed an important determinant of personality. Besides heredity, the other three factors that develop personality were physical environment, culture and life experiences. The strong correlation between physical environment and culture has played a significant role in determining personality by nurturing different ideas and attitudes in a man. Huntington (1915) gave an exhaustive discussion on effects of physical environment on human nature. Climate and geographic region influenced the cultural variability. A difference in topography, brought differences in the expression or manifestation of personality traits (DeYoung, 2010). So, differences in geography and culture brought differences in manifestation of personality traits in people from Northern and Southern part of India. Specific and unique life experiences which would stem from either a sudden encounter or continuous association with one's environment were other determinants of personality. Sometimes traumatic experience like death of a parent leaves a long-lasting influence on the personality of an individual.

The following section includes description of personality according to Indian psychology.

1.3 Personality in Indian psychology

In Indian psychology, '*Svabhava*' and '*Prakriti*' are the nearest defining terms for personality (Srivastava, 2012). The word *Svabhava* is frequently mentioned in the *Rig Veda*, *Advaita Vedanta* and *Avadhuta Gita* and *Prakriti* is mentioned in *Sankhya Darshan* and *Bhagavad Gita*. These terms and concepts of personality are as old as human civilization and their source is *Vedic sutras*. They imply the natural form or condition of everything, particularly a person's nature, character, constitution, temper or disposition (Rao & Paranjpe, 2016). The *Vedic* explanation states that personality has a group of characteristics and behaviours that is integrated to make a holistic construct with the aim of self-realisation. The *Ayurveda* is an *UpVeda* or subsidiary to the *Atharva Veda*. The *Ayurveda* defines personality from dual perspectives - physiological and psychological. The physiological elements are namely the *tridosha*—*vata dosha*, *pitta dosha*, and *kapha dosha*. The psychological elements have three *gunas*, *sattva guna*, *rajas guna* and *tamas guna*. The concept of *triguna* is elaborately mentioned in *Sankhya darshan* (mentioned later in this section).

After the *Vedas*, the *Upanishads* and the *Darshan sastras* are considered important ancient scriptures of Indian knowledge tradition. They propagate *Vedic* explanation of personality in different ways. The *Upanishads* have explained personality as self, five sheaths (*panchkosas*), six passions resulting in six patterns of personality, three dimensions of mind (*triguna*) and three dimensions of the body (*tridoshas*). Description by few *Upanishads* are mentioned below-

Brihadaranyaka Upanishad (1.4.1.) says "At the beginning of this (universe), self (*viraaj*) was of the human form. He reflected and found nothing but himself". Thus the concept of self here can be understood as a symbol of Personality.

आत्मैवेदमग्र आसीत्पुरुषविधः, सोऽनुवीक्ष्य नान्यदात्मनोऽपश्यत्, सोऽहमस्मीत्यग्रे व्याहरत्, ततोऽहं नामाभवत्;
तस्मादप्येतर्ह्यामन्त्रितोऽहमयमित्येवाग्र उक्त्वाथान्यन्नाम प्रब्रूते यदस्य भवति; स यत्पूर्वोऽस्मात्सर्वस्मात्सर्वान्पाप्मन उउषत्

तस्मात्पुरुषह्; ओषति ह वै स तम् योऽस्मात्पूर्वो बुभूषति य एवं वेद ॥ १. ४. १ ॥

Mandukya Upanisad (verse 6 and 7) states- “the self of a man can be divided in five organs of action- speaking, handling, walking, generating and excreting; five living fires- *Prana, Apana, Ayana, Udana, Samana*; discursive mind (*manas*), descriptive mind (*buddhi*), mind-material (*Chitta*) and personality (*ahamkara*)”.

एष सर्वेश्वरः एष सर्वज्ञ एषोऽन्तर्याम्येष योनिः सर्वस्य प्रभवाप्ययौहि भूतानाम् ॥ ६॥

नान्तःप्रज्ञं न बहिष्प्रज्ञं नोभयतःप्रज्ञं न प्रज्ञानघनं न प्रज्ञं नाप्रज्ञम्। अदृष्टमव्यवहार्यमग्राह्यमलक्षणं

अचिन्त्यमव्यपदेश्यमेकात्मप्रत्ययसारं प्रपञ्चोपशमं शान्तं शिवमद्वैतं चतुर्थं मन्यन्तेस आत्मा स विज्ञेयः ॥ ७ ॥

Isa Upanishad (verse 12) states “into deep darkness do they enter who worship the *asambhuti* (the world of becoming detached from being). Into still greater darkness, as it were, do they enter who delight in *sambhuti* (pure being or *Bramh*)”? The knowledge of the self-sufficient world is the way of materialism. This is a result of shallow philosophy and if followed for a long time, it will result in darkness and sorrow. Hence, a person should have complete knowledge of pure being or *Bramh*, and not get misguided by materialism or temporary attractive things.

अन्धं तमः प्रविशन्ति येऽसम्भूतिमुपासते । ततो भूय इव ते तमो य उ सम्भूत्या रताः ॥ ईशोपनिषद् १२ ॥

Brahmanandavalli, the third chapter of *Taittiriya Upanishads*, explain personality as *Panchkoshas* or five sheaths. The *panchkoshas* is a classical Indian model of Personality which states that Self is covered with five sheaths that form personality- ‘*Annamaya*’ (food sheath), ‘*Pranamaya*’ (vital air sheath), ‘*Manomaya*’

(mental sheath), '*Vijnanamaya*' (intellectual sheath), and '*Anandamaya*' (bliss sheath) (Srivastava, 2012).

'*Annamaya*'; is the segment of human system that is nourished by '*anna*', or food.

अन्नं प्राणं चक्षुःश्रोत्रमनोवाचमिति । तहोवाच । यतोवा इमानिभूतानिजायन्ते । येन जातानि जीवन्ति । यत्प्रयन्त्यभिसंविशन्ति ।

'*Pranamaya*' is the segment which is nourished by '*prana*', or bioenergy.

प्राणोब्रह्मेति व्यजानात् । प्राणादध्येव खल्विमानि भूतानि जायन्ते । प्राणेन जातानि जीवन्ति । प्राणं प्रयन्त्यभिसंविशन्तीति ।

'*Manomaya*' is the segment nourished by '*mano*' or education.

मनोब्रह्मेतिव्यजानात् । मनसोह्येव खल्विमानिभूतानिजायन्ते । मनसाजातानि जीवन्ति । मनः प्रयन्त्यभिसंविशन्तीति ।

'*Vijnanamaya*' is nourished by '*vigyan*' or ego.

विज्ञानं ब्रह्मेति व्यजानात् । विज्ञानादध्येव खल्विमानि भूतानि जायन्ते । विज्ञानेन जातानि जीवन्ति । विज्ञानं प्रयन्त्यभिसंविशन्तीति ।

'*Anandamaya*' is the segment nourished by '*ananda*' or emotions (Das, 1987).

आनन्दोब्रह्मेति व्यजानात् । आनन्दाध्येव खल्विमानि भूतानि जायन्ते । आनन्देन जातानि जीवन्ति । आनन्दं प्रयन्त्यभिसंविशन्तीति ।

In *Arishadvarga*, Shankaracharya has mentioned six passions of mind that creates six patterns of personality - Erotic pattern (*Kama*), Aggressive pattern (*Krodha*), Egoistic pattern (*Mada*), Acquisitive pattern (*Lobha*), Infatuated pattern (*Moha*) and Envy (*Matsarya*).

काम क्रोदस्व लोभस्व देहे तिष्ठन्ति तस्करः ज्ञान रत्नो -पहरय तस्मात् जाग्रत ।

Despite of having differences in their explanations, every scripture provides a well-integrated and holistic nature of personality in itself. None of the theories

disputed the other. They all include important contents like origin, persistence, determinants and dynamics of personality.

Like *Upanishads*, *Satdarshan* also known as six philosophical schools of Indian psychology have explained personality from their varied and unique perspectives.

In *Nyaya Darshan* and *Vaishesika Darshan*, the unique Self (*atman*) is the essence of human personality. Its qualities are atomic, eternal, indestructible and infinite. This Self is in contact with the external world through senses, mind and body. When 'self' establishes a functional relationship with its adjuncts and external world, it is said to be existing as human personality (Sharma, 2001). The development of human personality is possible through valid knowledge (*prama*) and means of acquiring valid knowledge (*pramana*).

Kapil Muni propounded *Sankhya Darshan*, which advocates personality (*Prakriti*) as a composition of *Triguna*- *Sattvic* (purity), *Rajasic* (passion) and *Tamasic* (inertia) *Gunas*. *Triguna* are human temperaments with their specific qualities such as- *Tamas* has inertia, *Rajas* has passion and *Sattva* has illumination. The *sattva*, *rajas* and *tamas gunas* determine specific response to stimulus, food preference, activity, restraint, effort, knowledge, insight, confidence and happiness (Bahm, 1970).

Maharshi Patanjali, the founder of *Yoga Darshan*, has emphasised the importance of knowledge and practice of eight stages of yoga or *Astangyoga* to make a man free from the bondage of materialism, suffering, and desires. Every stage of yoga consists of certain vows that harness positive attributes of personality (*Prakriti*) such as non-violence, truthful, self-discipline, simplicity in life, non- stealing, clean body and mind, content, determine, self-education by reading scriptures, surrender to

God, steady mind and control over thoughts. These attributes make a person capable of achieving the ultimate aim of *Yoga* i.e. super consciousness. It is a state in which one is able to go beyond the present state of bondage, rise above error, and move into truth, perceive what is right and attain illumination (Chidananda, 1991).

Purva Mimansa Darshan by Jaimini is the condensed explanation of rightful means, i.e. *dharma* of obtaining personal happiness in this life and the life after. It relates personality of an individual to follow these rightful means and lead a rightful life.

Uttar Mimansa Darshan (Brahm Sutra) by Vyas claims that every individual should be directed towards attaining true liberation with the knowledge to know God or supreme power and surrender to Him. This is possible by performing duties and rituals that serve the purpose of purifying the mind (V. S., 3.4.27.). The concept of personality development in *Uttar Mimansa* is based on the purification of the mind by rituals and duties for attaining true liberation.

Other than the *satdarshan*, *Srimad Bhagavad Gita* is an integral part of *Mahabharata*, an epic scripture. It is also considered a principal *Upanishad* according to Adi Sankaracharya. The *Bhagavad Gita* is universally acknowledged as a classic text in understanding human personality and psychology. It explains the structure, nature and evolution of human personality with reference to the concept of *Triguna* (Das, 1991). According to *Bhagavad Gita*, personality (*Prakriti*) consists of dynamic organisation of *sattva*, *rajas* and *tamas gunas*. The difference in proportion of *gunas* leads to difference in personality, behaviour and cognition among individuals.

In Indian knowledge system, the study of the human mind, behaviour and personality has rested in the domain of Indian psychology and its scholars have

propounded various personality theories. Modern researchers have exercised the traditional knowledge to provide a conceptual framework of personality according to three *gunas* (*triguna* theory), three *doshas* (*tridosha* theory), *svabhava* etc.

Dwivedi (2002), Krishnan (2002), and Misra and Kumar (2011) have provided different concepts of personality. A brief description on *Sankhyan* view of human personality was presented by Naidu (1994) highlighting the power and flexibility of the transpersonal approach to account for a worldwide range of psychological phenomena under the title ‘traditional Indian personality concepts and the unrealized potential for a paradigm shift’. On account of the relation between personalities, self and consciousness, Dash and Rout (2004) presented the absolute and self-existent consciousness nature of personality in Indian psychology. Paranjpe (1986, 1998, and 2004) considered *jiva*, *svabhav*, *prakrti*, *ahamkara*, *aatman* and *purusha* as the most important concepts related to personality and self. Srivastava (2012) brought Indian concepts of self and personality into a light, and Bhawuk (2005) contributed the model of physical, social and metaphysical self and their relation to work, material path and spiritual path.

All of these theories have explained personality in their unique ways but concluded at a common point- self-realization. Amongst them, *Triguna* theory is a psychological construct of personality. It has attracted researchers in Indian psychology since the 1970s and is concluded to have three prime data- a) its inclusive properties and cross-cultural relevance (Wolf, 1996, 1999); b) its dynamic nature (Anuradha & Kumar, 2015; Beena, 1990; Bhal & Debnath, 2006; Biswas, 2010; Das, 1987; Ilavarasu, Mohan & Hankey, 2017; Janghel & Shrivastav, 2016; Marutham, Balodhi & Misra, 1998; Mohan & Sandhu, 1986; Sharma, 1990); and c) its typological structure, indicating a type approach of personality.

The above stated three reasons have been intriguing and have stimulated interest in scholars to investigate further. Till now, researchers have concluded *triguna* as type, temperament and also a trait (see section 1.2.2.), but its qualities (such as behavioural and cognitive) have not been used to propagate a personality theory. Hence, developing the SRT-trait model gives a categorical meaning to qualities of *triguna* as traits. But before moving to this model, a comprehensive read of *Triguna* and previous studies would be beneficial.

1.3.1 Triguna as Personality in Classical Indian literature

Triguna is the subtle basis of the existence of all things in the world. It has a material dimension and a mental dimension. The material dimension consists of the physical world and mental dimension consists of the psychological and spiritual world.

Triguna is an ancient concept of personality, explaining the mind-body complex. As mentioned earlier, it is a constituent of *Prakriti*. *Triguna* as a concept is derived from *Rig Veda*, *Atharva Veda*, followed by *Sankhya Darshan* and *Bhagavad Gita*. *Sattva*, *Rajas* and *Tamas gunas* are basic components that constitute *Triguna* and their predominance describe individual personality. These *gunas* are latent and cannot be perceived directly, but they affect the physical, psychological and behavioural components in human beings. Each *guna* causes an action of specific quality that brings differences in personality of individuals. A discourse on *Triguna* is mentioned in the verses of *Atharva Veda*, *Svetasvataropnihad*, *Maitrayani Upanishad*, *Chandogyopnihad*, *Ayurveda*, *Sankhya Darshan*, *Charaka Samhita*, *Sushruta Samhita*, *Mahabharata*, *Bhagavad Gita* and *Vivekchudamani*. These scriptures contain information on characteristic qualities of *triguna*, which are used to prepare the SRT-Trait model.

Atharva Veda (X.8.43) is one of the first scriptures that contains information about *Triguna* as human temperament. It advocates that human temperament consists of *Tamas* that is harmful and destructive nature, *Rajas* that is selfish and sensuous in nature and *Sattva* that is selfless and serene in nature. *Atharva Veda* urges man to control *Rajas* and *Tamas* to avoid pain and sickness.

तस्मिन् यद् यक्समत्मन्वत् तद्वैब्रःमविदो विदुः (१०.८.४३)

Svetasvataropnisad (6.4) has mentioned that one can realize his true self by performing actions such as an offering to the supreme power and by merging *prakrti* and all its effects in *Brahman*.

आरभ्य कर्माणि गुणान्वितानि भावांस च सर्वान विनियोजयेद् यः

तेषां अभावे व्रतकर्मनासः कर्मक्षये याति स तत्त्वतो नयः ६.४

Maitrayani Upanishad (2.3) states that the elemental soul is the one that acts and internal soul is the one that causes the action. The elemental soul has various forms due to *gunas* and influence of internal soul on *gunas*. The mental or psychological phenomenon as outcome of predominance of each *guna* are—
Confusion, fear, drowsiness, sleep, sloth are caused by *tamas guna*; thirst, fondness, love, hatred, jealousy are effects of *rajas guna*; pleasure and happiness are outcomes of *sattva guna*.

अथान्यत्राप्युक्तं यः कर्ता सोऽयं वै भूतात्मा करणैः कारयितान्तःपुरुषोऽथ यथाग्निनायःपिण्डो वाभिभूतः कर्तृभिर्हन्यमानो नानात्वमुपैत्येवं
वाव खल्वसौ भूतात्मान्तःपुरुषेणाभिभूतो गुणैर्हन्यमानो नानात्वमुपैत्यथ यत्त्रिगुणं तुरशीतिलक्षयोनिपरिणतं भूतत्रिगुणमेतद्वै नानात्वस्य रूपं
तानि ह वा इमानि गुणानि पुरुषेणेरितानि चक्रमिव चक्रिणेत्यथ यथायःपिण्डे हन्यमाने नाग्निरभिभूयत्येवं नाभिभूयत्यसौ पुरुषोऽभिभूयत्ययं

भूतात्मोपसंश्लिष्टत्वादिति ॥ २.३ ॥

Chandogyopnishad has also briefly mentioned the elemental character of the three *gunas* in terms of three colours, three degrees or forms of development (स्थविष्ठ, मध्यम, अनिष्ठ) and three qualities of action (अधम, मध्यम, अग्र्य) and all that things in the universe are composed of them.

Sankhya karika has defined *sattva guna* as illumination, calm (S.K. 12); buoyant (S.K. 13); *rajas guna* as action-oriented, agitated (S.K. 12); exciting and mobile (S.K. 13); *tamas guna* as restrained, dull, torpid (S.K. 12); sluggish and obscuring (S.K. 13).

Radhakrishnan (1966) explicated, “*Samkhya* philosophy had established a dualism between *purusha* and *prakriti*, where *prakriti* is the source of all existence in presence of *purusha* though *purusha* is the disinterested spectator of the evolution of *Prakriti*”. Extending the knowledge of *Veda* and *Upanishads*, *Sankhya* propounded that everything in the universe, physical or psychological has originated from *mula-prakriti* which is tri-dimensional (Sharma, 1990). It can also be called to be of three tendencies or *Trigunas*, namely *sattva*, *rajas* and *tamas guna*. Under the influence of *purusha*, *prakriti* initiates the process of evolution and produce 24 evolutes or *tattva*. The first product of evolution is *mahat*, the cosmic that exists in nature. *Buddhi* is the psychological counterpart of *mahat*. It is the subtle substance of all mental processes, giving rise to *ahamkara* (ego), the principle of individuation. *Ahamkara* has three significant aspects. Its *sattvic* nature gives rise to *manas* (mind), five organs of perception (*gyanendriyas*- ear, skin, eye, nose and tongue) and five organs of action (*karmendriyas*- speech organs, genital organs, anus, hand and foot). From its *tamasic* aspect arises the five subtle elements (*tanmantras*) of sound (*shabd*), touch (*spars*), sight (*roop*), taste (*rasa*) and smell (*gandha*). These subtle elements develop into gross elements – sky or ether (*akash*), air (*vayu*), fire (*tejas*), water (*apas*) and earth

(*prithvi*). Its *rajasic* nature supplies energy for this line of development. The knowledge of *prakriti* and *purusha* brings liberation to human beings. Figure 1.1 eloquently explains this evolution process.

Figure 1.1. *Sankhyan philosophy of evolution*

Ayurveda is an important scripture in the field of traditional and contemporary medical science. It contains three *Samhitas* based on knowledge of therapeutics, surgery and the general principle of medicine, contributed by *Charaka Samhita*, *Sushruta Samhita* and *Vagbhata* respectively. Among them, *Charaka Samhita* (by sage *Charaka*) and *Sushruta Samhitas* (by sage *Susrta*) contains a detailed description of psychology and personality typology. Sage *Charaka* has followed the teachings of *Atharva Veda* and included it in *Charaka Samhita* according to which, a human being should be understood from psycho-somatic perspective. The physical perspective is composed of *vatta*, *pitta* and *kaph*, and mental is composed of *sattva*, *rajas* and *tamas gunas*. *Charaka* has given importance to psychosomatic disorders that are caused due to increase or decrease in *rajas* or *tamas guna* beyond the necessary degree. Like *Charaka*, Sage *Susrta* accepted the distinction between the physical and mental side

of personality and their respective *gunas*. His work in psychotherapeutics to treat psychosomatic disorders is considered superior to *Charaka* (Singh, 1977). *Charaka* and *Susruta* have given a description of 16 personality types based on *gunas* and are listed in Table 1.1.

Table 1.1

Types of personality as enlisted in Charak and Susruta Samhita

Seven types of <i>Sattva</i>	Six types of <i>Rajas</i>	Three types in <i>Tamas</i>
<i>Brahma Sattva</i>	<i>Asura Rajas</i>	<i>PasavaTamas</i>
<i>MahendraSattva</i>	<i>Rakshasa Rajas</i>	<i>MatsyaTamas</i>
<i>VarunSattva</i>	<i>Pisacha Rajas</i>	<i>VanaspatyaTamas</i>
<i>KuberSattva</i>	<i>Sarpa Rajas</i>	
<i>GandharvaSattva</i>	<i>Praita Rajas</i>	
<i>Yama Sattva</i>	<i>Sakuna Rajas</i>	
<i>Rishi Sattva</i>		

Mahabharata is one of the most celebrated epic *Purana*. In 1 of its 18 chapters, the *Vanaparva* (CCXI, 5-8) has mentioned *Triguna*. *Bhagavad Gita* (14.5-18) is an integral part of *Mahabharata* from *Bhismaparva*. It includes information and explanation of the *gunas* in detail. Both *Mahabharata* and *Bhagavad Gita*, have mentioned about the origin of *gunas*, their qualities and their expression in behaviour. But *Bhagavad Gita* has classified gross and subtle behaviour of human and non-human into three unique and universal *gunas* (Beena, 1990). The *Bhagavad Gita* has mentioned the qualities of three *gunas* as following: the qualities of *Sattva Guna* are to be pure, serene, luminous, stainless, and happy and be attached to knowledge (B.G.

14.6); to experience tranquillity of the senses and remain peaceful (B.G. 14.11); and to be wise (B.G. 14.17). The qualities of *Rajas Guna* are to have a passion, craving, thirst/ desire and a tendency to express that thirst, to be action-oriented and be attached to activity (B.G. 14.7); to be greedy and constantly plan new actions (B.G. 14.12). The qualities of *Tamas Guna* are ignorance, put believes in falsehoods due to veiled knowledge, experience loss of attention or alertness, feel tired, sleepy and lack interest in work (B.G. 14.8); have darkness in mind and heart and experience inertia (B.G. 14.13); tends to be delusional and utter ignorance (B.G. 14.17). Given below is the categorical (behavioural and cognitive) representation of the qualities of *Triguna* according to *Bhagavad Gita* -

- i. Food preferences- Food that provides longevity, vitality, strength, health, brings happiness, cheerfulness, nourishment, pleasant and tender is preferred by *Sattvic* (B.G. 17.8). Food rich in tastes like sour, bitter, salty, hot, spicy, dry and burnt is preferred by *Rajasic* (B.G. 17.9). Food that is stale, tasteless, smelly, spoiled, left over and untidy are preferred by *Tamasic* (B.G. 17.10).
- ii. Sacrifices- A *Sattvic* performs sacrifices which are in accordance with scriptures and without any expectations in return (B. G. 17.11). A *Rajasic* performs sacrifices to show-off or in greed of results and fruits of the actions (B.G. 17.12.). A *Tamasic* performs sacrifices which are not in conformity with scriptural injunctions like without offering any food and sacred chants of hymns and without true faith (B.G. 17.13.).
- iii. Habit- A *Sattvic* performs pro-social verbal, mental and physical actions. He uses words that are truthful, agreeable, and beneficial and avoid words that cause annoyance to others. He studies *Vedas*, *shastras* and chant divine's name, and have a cheerful mind, placidity, control of feelings and habit of

contemplation on God (B. G. 17.15-16.). A *Rajasic* performs verbal, mental and physical activity for the sake of popularity, honour or adoration, selfish gain, and yields in uncertain or momentary fruit (B. G. 17.18.). A *Tamasic* performs a verbal, mental and physical activity out of foolishness. He is unreasonably stubborn, indulges in self-humiliation and intends to harm others (B. G. 17.19.).

- iv. Attitude towards duties- A *Sattvic* performs the duties because they are prescribed by scriptures and performance of these duties require giving up of pleasant and unpleasant emotional attachments and fruits related to them (B.G. 18.9.). A *Rajasic* abandons the duties because of fear of physical strains (B.G. 18.8.). A *Tamasic* abandons the duties because of ignorance, and performs acts that are prohibited and motivated by desires (B.G. 18.7).
- v. *Gyana* (knowledge) –A *Sattvic* has knowledge that perceives imperishable divine in all things (B.G. 17.20). A *Rajasic* has knowledge by which he discriminates between various things (B.G. 17.21). A *Tamasic* has knowledge which is irrational, trivial and without real grasp of truth, but pretends to know everything (B.G. 17.22).
- vi. Mind set – A *Sattvic* is egoless, determined, stays unattached and unaffected by success and failure (B.G. 18.26); and has faith in goodness (B.G. 17.4). A *Rajasic* is full of attachments to materialistic desires, feels joy and sorrow strongly, seeks the fruit of actions, is oppressive in nature and practices impure conduct (B.G. 18.27); is greedy and aggressive (B.G. 14.12); and ambitious and anxious (B.G. 14.9). A *Tamasic* lacks devotion and self-control, is uncultured, arrogant, and deceitful, is inclined to rob others for their livelihood; is slothful, hopeless and procrastinates (B.G. 18.28); is stagnant,

gloomy and delusional (B.G. 14.13); has an altered view of the truth (B.G. 14.9); and is attracted by pretence and arrogance, and tortures himself with harsh austerities that are not in accordance with scriptures (B.G. 17.5-6).

- vii. Intellect- A *Sattvic* has an intellect by which he correctly determines the path of activity and renunciation, is aware about the dos and don'ts and of bondages and liberations (B.G. 18.30). A *Rajasic* has an intellect by which he is unable to perceive *dharma* from *adharma*, dos from don'ts (B.G. 18.31). A *Tamasic* has an intellect wrapped in ignorance, which makes him perceive *adharma* as *dharma* and sees all things upside down (B.G. 18.32).
- viii. Perseverance (*Dhrti*) - A *Sattvic* has an unwavering perseverance by which he has control over his mind, breath and senses (B.G. 18.33). A *Rajasic* has a perseverance to seek reward for his actions, grasp his thoughts, worldly possessions and enjoyments with extreme fondness (B.G. 18.34). A *Tamasic* has a perseverance that makes him evil-minded, sleepy, fearful, anxious, sorrowful and arrogant (B.G. 18.35).
- ix. Joy- A *Sattvic* finds joy in practicing adoration, meditation and serving God; initially it appears like poison but at the end it becomes like nectar (B.G. 18.36-37). A *Rajasic* feels delighted when stays in contact with sensual objects; initially it appears like nectar but eventually it becomes poison (B.G. 18.38). A *Tamasic* finds joy in sleep, indolence and obstinate error, and gets absorbed in enjoyments even if they have destructive ends (B.G. 18.39).

In *Vivekcudamani*, Sri Shankaracharya has explained personality using the concept of *Triguna*. He has mentioned the characteristics of all the three *gunas*. *Sattva guna* is explained as pure, modest and useful for liberation (Verse 117); harmless, cheerful, truthful, blissful, generous and content. It directs one towards *yama and*

niyam of *yoga darshan*, helps to control organs, develops faith, devotion and desire for liberation, self-purification, self-realisation and the attainment of supreme peace (Verse 118). Characteristics of *Rajas Guna* are greed, pride, envy, egotism, constant attachment to the worldly desires, an engrossment in sorrow and pain, and disturbances of mind (Verse 111); desires enjoyment and excitement, anger at any obstruction of the enjoyment; and jealousy (Verse 112). Characteristics of *Tamas Guna* are ignorance, dullness and sleep (Verse 115), the covering of truth with false knowledge, pretentious behaviour (Verse 113); lacks belief in supreme reality, but believe in falsehood and things that are unrealistic (Verse 114).

In present times, personality models are acceptable if supported with testing and experimentation (Ellis, Abrams & Abrams, 2009). Empirically fashioned studies on human personality takes psychology to a point, where it is able to predict human behaviour more accurately than in past. So, modern personality research of Indian psychology have brought a shift in the position of *Triguna* theory from classical literature to research with empirical and semantic groundwork by modern scholars. The next section includes such studies in detail.

1.3.2. Modern research on *Triguna*

Indian psychology has its roots in Indian philosophy and the concept of *Triguna* has been emphasised for explaining personality. The concept of *triguna* had always generated curiosity among researchers and had stimulated a huge amount of research. Since four to five decades, scholars have developed conceptual models of *triguna*, personality scales and studied the relationships between *triguna* and different variables like *yoga*, leadership, extrasensory perception, cognitive characteristics, psychological well-being etc. For the convenience of reference, the current study divides the previous studies into three sections. The first section includes studies

about the development of various conceptual models of *triguna*. The second section includes the development of personality scales on *triguna*. The third section includes studies which had additional conceptual frameworks and scales based on them, and correlations of these scales with other variables.

Given below is the first section of studies with the development of the conceptual model of *triguna*. These theoretical models define personality as a configuration of *sattva*, *rajas* and *tamas guna*.

Deo and Kulkarni (2004), Ilavarasu, Mohan and Hankey (2017), Krishnan (2002), and Subbarayudu, Rambai and Ramakrishna (2012) have developed a theoretical model of *Triguna* to understand personality. They interlinked all relevant philosophical information from the Indian knowledge system related to personality. They pointed out that human nature is a configuration of three qualities or *gunas*- *sattva*, *rajas*, and *tamas*. Further, they iterated characteristics of *triguna*.

Singh and Misra (2013) extended the psycho-lexical approach to Hindi, put together a huge set of personality descriptors and ultimately reduced to a manageable set of 295 trait terms. Principal Component Analysis (PCA) surfaced six factors namely, *rajasic*, *tamasic*, *sattvic*, competence, neuroticism, and extraversion.

Chokkalingam, Akhilesh, and Nagendra (2016) gave a theoretical model of *triguna* and categorized its qualities in 12 dimensions - faith, food, sacrifice, austerity, gift, obligatory work, knowledge, action, agent, intellect, determination and happiness. They suggested different ways to create a *sattvik* environment for organisational development.

Varshney and Swastik (2016) gave an integrated model of *Triguna* for application in the field of medicine. They studied the interrelationship between the

classical *trigunas* concept and human metabolism, *panchamahabhootas*, endocrinal system and pathology of *mānasika rogas*.

The second section included studies on the development of personality scales on *triguna*. These scales include items that measure *triguna* through their characteristics as mentioned in ancient scriptures.

One of the earliest inventory of *triguna* was developed by Uma, Lakshmi, and Parameshwaran (1971) named as '*Guna Inventory*'. This inventory was based on the descriptions of the characteristics of the three *gunas* as mentioned in *Sankhya Karika*. It consisted of 24 *sattvic* items, 27 *rajasic* items and 29 *tamasic* items in statement form. The response pattern was 3-point rating scale- agree, disagree and doubtful. The total score of each *guna* was a summation of the scores on the items of that *guna*.

Marutham, Balodhi and Misra (1998) developed the SRT factor inventory to understand the disposition of *Triguna* as factors in an individual. It consisted of 120 items with 4-point response scale that ranged from never true to always true. The 4-point scale was used to control mid-point rating. The inventory yielded three scores, one for each factor and these scores determined the range of each *guna* in individual personalities.

Narayan and Krishnan (2003) attempted to measure the three *gunas* through ten dimensions i.e. attribution, leisure, food, interest, praise and criticism, sympathy, right and wrong, working with determination, motivation to work and accepting pain.

Bhal and Debnath (2006) developed a scale to measure three *gunas* as illumination, passion and dullness through a four-step process and predicted ethical frameworks, spirituality and acts of software piracy in organizations. The first step contained definition of the construct and items of the three *gunas*. The second, third

and fourth steps contained empirical studies conducted on different samples to measure factor stability, reliability, discriminant validity, and other validities of the scale.

Shilpa and Murthy (2012) developed ‘Mysore *Triguna* Scale’ and ‘Mysore *Tridosha* Scale’ to assess personality in two major domains- *Tridosha* and *Triguna*. It consisted of 189 items, where each *guna* had 63 items with 3-point rating scale and stanine scores as standardized norms. This was one of its kind scale that had interrelated items of both physiological and psychological components of personality.

Janghel and Srivastav (2016) developed a personality scale for the adult population that assessed relatively distinct and clearly focused three personality attributes i.e. *sattvic*, *rajasic* and *tamasic* attributes of personality. The scale had 29 items based on three factors (e.g. *sattva*, *rajas* and *tamas*) and two response option, yes or no.

The third section includes studies with conceptual models (on *Triguna* from *Bhagavad Gita*, *Mahabharata* and *Sankhya Karika*) to develop personality scale and correlated *triguna* with other scales and variables.

Singh (1971) gave 11 categories of behavioural manifestations of *gunas* based on *Mahabharata*—1) Temperamental condition, 2) Cognition category, 3) Beliefs regarding creation, 4) Attitude towards people and human nature, 5) Values, 6) Self-feeling, 7) Affectivity in two groups –a. *Raga*, giving joy and b. *Dwesh*, giving pain, 8) *Abhinives* (Basic urge), 9) General motivation, 10) Interests, and 11) Habits. With these categories, he had prepared ‘An inventory on Mahabharata’. The inventory had 40 forced-choice items in an interview schedule, which gave the clinician a pattern to understand the nature of patient’s intra-psychic processes.

Das (1987) propounded a theoretical model- Gita Typology of Personality, which indicated that human nature comprised of *sattva*, *rajas* and *tamas guna*. It also contained the description of characteristics of the three *gunas* as outlined in the *Bhagavad Gita*. He used this model to develop an inventory and found that *sattva*, *rajas* and *tamas guna* had negative correlations among each other at significant levels.

Based on *Triguna* theory, Mohan and Sandhu (1986, 1988) constructed *Tri Guna* scale (TGS) of personality to assess personality in a holistic manner. It consisted of 49 statements to measure *sattvic guna*, *rajasic guna*, and *tamasic guna*. The statements were framed on life situations, views on philosophical, intellectual, social, emotional and religious outlooks, and personal habits like the choice of food, clothing, housing, music, literature etc. Each statement had three alternatives referring to *sattvic*, *rajasic* and *tamasic* mode of response. The participant were requested to respond by laying first, second and third preference to each of the alternative in every statement. The scale found a significant negative correlation between *sattvic guna* and both *rajasic guna*, and *tamasic guna*. Later, this scale was used to find a correlation between the *Triguna* Personality Inventory and Eysenck's personality questionnaire. The findings revealed that *sattva guna* had a significant and negative correlation with extraversion and psychoticism. *Rajas guna* had a negative correlation with neuroticism and positive correlation with extraversion. *Tamas guna* had a positive correlation with psychoticism.

Mathew (1995) defined *sattva* as stability, *rajas* as activation and *tamas* as inertia. He developed IAS rating scale of personality to measure three broad behavioural tendencies as inertia, I (*Tamas* tendency), activity, A (*Rajas* tendency) and stability, S (*Sattva* tendency). The scale had 35 subscales and a careful analysis revealed their predominant relation to *manomaya* and *anandamaya koshas*.

Sharma (1990) propounded a *Triguna* model of personality and prepared the SRT scale based on it. The scale had 88 items with a five-point rating scale (not at all to very much) response pattern. The scale identified personality *guna* system and gave categorical and percentile norms. The findings suggested a low correlation between *sattva*, *rajas* and *tamas scales* implying to the independence of the three dimensions. A few researchers used standardized *Triguna* inventory to find a correlation between *guna* and different variables.

Rao and Harigopal (1979) used Guna Inventory (Uma, Lakshmi & Parameswaran, 1971) along with standard five-run ESP test to explore the relation between *gunas* and Extra Sensory Perception (ESP). They found a negative correlation between *Tamas* and ESP.

Sitamma, Sridevi and Rao (1995) explored the relationship between the three *gunas* and cognitive characteristics - memory, intelligence, perceptual acuity and field dependence-independence. The cognitive characteristics were measured with the Group Embedded Figures Test (GEFT) test. The results revealed a significant negative correlation between Group Embedded Figures Test (GEFT) scores and *tamas*.

Kapur, Hirisave, Reddy, Barnabas and Singhal (1997) explored the relationship between temperament and *Triguna* of normal and psychologically disturbed children of 4 to 6 years of age. They had prepared a checklist of 17 items, describing *sattvic*, *rajasic* and *tamasic* temperamental traits. They found the *sattvic* disposition in the majority of the normal children and distinct temperamental profiles of normal and disturbed children group.

Wolf (1998) developed Vedic Personality Inventory to assess the validity of the Vedic concept of the three *gunas*. Descriptions of each *guna* were compiled from the 14th, 17th and 18th chapters of the *Bhagavad Gita*. The 56 items consisted of 15 *sattva*, 19 *rajas* and 22 *tamas* items. Inter sub-scale correlation showed positive association between items of *Tamas* and *Rajas* sub-scales. With this inventory, Wolf and Abell (2003) measured the effect of recitation of *Mahamantra Japa* on *triguna*. They found an increase in *sattva* and decrease in stress and depression as effects of reciting.

Zaidi and Singh (2001) studied the relation of *Triguna* with effects of life events and psychological well-being. Results indicated that an increase or presence of high *sattva* lead to low depression, whereas *rajas* lead to high depression. Healthy psychological well-being was distinguished by high *sattva*, low *rajas* and high *tamas*. Details about the scales used were not available.

Sebastian and Mathew (2001) conducted a study to understand the relation between *Triguna* Personality Dimensions and PSI (Parapsychological Investigation) on a sample of 200 males and 200 females around the age of 19 to 25 years. They used Inertia, Activity, Stability (IAS) rating scale (Mathew, 1995) for *Triguna* personality analysis and the PSI inventory for parapsychological investigation. The findings suggested a significant positive correlation between parapsychological investigation (PSI) and activation and stability in females, and positive and but not significant correlation in males.

Rastogi (2005) compared seven constructs of the psychological concepts of well-being from the Western perspective i.e. self-acceptance, positive relations with others, autonomy, environmental mastery, the purpose of life, satisfaction with life

and personal growth with *Triguna*. Findings indicated a negative correlation of psychological concept of well-being with *tamas* and *rajas*, and a positive correlation of psychological concept of well-being with *sattva*.

Kewalaramani (2006) found that emotional intelligence correlated positively with *sattva guna* and negatively with *tamas guna*.

Jain and Sharma (2008) investigated the relationship between *triguna*, subjective well-being, and satisfaction with life, physical health, mental health and spiritual health. The findings indicated no significant correlation between *triguna* and Physical Health (Body Mass Index). *Sattva guna* had a positive and significant correlation with Subjective Well Being, Satisfaction with Life and Spiritual Health. *Rajas guna* had no significant correlation with one of the factors of Mental Health (Satisfaction with Life) and with four factors of Subjective Well-Being (General Well-Being Positive-Affect, Expectation Achievement Congruence, Family Group Support, and Social Support). *Rajas guna* had significant negative correlation with eight factors of Subjective well-being i.e. Confidence in Coping, Transcendence, Primary Group Concern, Inadequate Mental Mastery, Perceived Ill-Health, Deficiency in Social Contacts, General Well-Being Positive -Affect and Total Subjective Well-Being. *Rajas guna* had a significant negative correlation with Spiritual Health. *Tamas guna* had a significant negative correlation with Mental Health, a significant negative correlation with Subjective Well-Being and Satisfaction with Life and a positive and significant correlation with two factors of Subjective Well-Being i.e. General Well-Being Positive-Affect and Social Support. *Tamas guna* and Spiritual Health had significant negative correlation with each other. Hence a decrease in *Tamas guna* increased mental health.

Shilpa and Murthy (2011) studied the relationship of three *doshas* (*vatta*, *pitta* and *kaph*), three *gunas* (*Sattva*, *Rajas* and *Tamas*) and their implications for an integrated personality composition at the physical and psychological level. They developed Mysore *Tridosha* Scale and the Mysore *Triguna* Scale. While studying the interrelation of *triguna*, they found a high and significant correlation between *rajas guna* and *tamas guna* in general adult group. The group of teaching professionals had high significant correlation with *sattva guna* and low with *rajas* and *tamas guna*. This indicated that when *sattva* was high, *rajas* and *tamas* were low and vice-versa.

Khanna, Singh, Singla and Verma (2013) examined the relationship between *gunas* and well-being indicators- psychological capital, personality, life satisfaction, and subjective happiness. They used Vedic Personality Inventory, Mental Health Continuum-Short Form, Psychological Capital Questionnaire, Big-Five Personality Inventory, Satisfaction with Life Scale and Subjective Happiness Scale. Findings suggested that *Sattva* was positively correlated with well-being. *Rajas* and *Tamas* had a negative correlation with well-being. Higher levels of *Sattva* and well-being were reported in the older age-group. Males scored higher on *Rajas* while no gender differences were found in well-being (Khanna, P., Singh, K, Singla, S. & Verma, V, 2013).

Arora (2015) did a preliminary exploratory study to find a correlation between *Triguna* with coping strategies among women. The *triguna* were measured by Vedic Personality Inventory (Wolf, 1998) and coping strategies were measured by Coping Strategy Inventory (CSI). The findings suggested that *sattvic* women had problem solving and cognitive restructuring as predominant coping strategies. The working *sattvic* women preferred problem solving and cognitive restructuring equally. The non-working *sattvic* women used problem solving as the predominant strategies. The

rajasic women had cognitive restructuring as the predominant coping strategies. The working *rajasic* women had cognitive restructuring as the predominant strategies and the non-working *rajasic* women had both cognitive restructuring and problem-solving as their predominant strategies. No strategies were used by *Tamasic* women predominantly. However, self-criticism and problem avoidance were noticed in these women.

Soubhari and Kumar (2015) used Vedic Personality Inventory (VPI) to analyse personality types and its predominance based on the *guna* theory, and the impact of each *guna* on the levels of stress. The results showed that students (< 30 years) had high *rajasic* and *tamasic* scores but low *sattvic* scores. According to the researchers, due to high manifestation of *rajasic* and *tamasic gunas*, students exhibited mixed behaviours such as they wished to stay active and aggressive, lazy and procrastinating, had variant wishes for different types of food, demands for entertainment and fun, and tried to make life more memorable, had a sharing and caring behaviour for their family and friends, liked to stay independent with nobody interfering in their personal affairs, and felt more stressed and worried about future. The retired participants scored low on *tamas* and *rajas* scores, and high on *sattva* scores. Besides, it showed that they were healthy and self-conscious, had more patience, had high spiritual ways to remain calm and moderated, surrendered themselves to supreme power and were able to manage stress by self-motivation techniques.

Kewalramani (2016) studied the interrelation between *Triguna* and state and trait anger. Two psychological scales – Spielberger's (1985) State-Trait anger scale (STAS) and Wolf's (1998) Vedic personality inventory were used. The results indicated a positive relationship between *-rajas guna* and state and trait anger, *tamas*

guna and state and trait anger, and negative relationship between *sattva guna* and state and trait anger.

Kumar and Balodhi (2016) used SRT inventory to find a predominance of *sattva*, *rajas* or *tamas guna* in people with the clinical condition and people without it. The results of the study showed dominance of *rajas guna* in a clinical population and *sattva guna* in a normal population.

Yadav, Prakash and Jain (2016) studied the correlation between *triguna* and risk-taking behaviour. Personality Assessment Profile (Parashar, Dhar & Dhar, 2011) was used to measure *Triguna* and Risk-taking Questionnaire (Sinha & Arora, 1983) was used to measure risk-taking behaviour. Findings suggested that *sattvic* personality and *tamasic* personality do not correlate with risk-taking behaviour. *Rajasic* personality and risk-taking behaviour had a significant positive correlation.

Few researchers have conducted studies to relate *Ayurveda* based personality type with different variables. Mukherjee and Wahile (2006) explored *Ayurveda* and other Indian systems of medicines with the modern scientific approaches for better leads in the health care.

Sreelakshmi and Manay (2006) studied the relationships between the nutritive quality of food (*sattvic* food) and well-being (affective, cognitive and physiological experiences). They conducted a longitudinal study for a period of four years in which the participants were asked to change their food habits and food contents from *tamasic* and *rajasic* to *sattvic* food. Findings suggested that consumption of *sattvic* food had a significant positive effect on well-being.

The studies given below present the effect of *Yoga* on *gunas*.

One of the earliest studies on these lines, Balodhi and Singh (1985) found difference between modern and ancient Indian view on brain functions as enumerated in Hindu philosophy and yogic text.

Patil and Nagendra (2014) studied the effects of Yoga Personality Development Camp on *trigunas* of 200 children, aged 8-12 years. The findings suggested that yoga personality development camp resulted in a significant increase in *sattva guna*, and a significant decreased in *rajas guna* and *tamas guna*.

On the same lines, Betal (2015) conducted a study to measure changes in the dominance of either of the *gunas* through pranayama and meditation. Results concluded that practising these yogic processes helped to attain *sattvic guna* dominance and balance the other *gunas*. The *triguna* had a profound role in determining the behavioural characteristics of a person. Thus, these *gunas* were very effective in the framing different personality pattern.

Naorem, Subrahmanyam and Singh (2016) worked with 80 young widows (below 50 years) for eight weeks in an intervention program and used *yoga* as a tool. They used Vedic Personality Inventory on subjects before and after the intervention. The results indicated an increase in *sattva guna* and decrease in *tamas guna* with *yoga* practice.

The following studies show the relationship between *triguna*, job satisfaction, managerial and organizational behaviour.

Kaur and Sinha (1992) studied the relationship between *triguna* and organizational behaviour of 310 executives from 13 organizations. They identified four factors — *tamas guna*, *rajas positive guna*, *sattva guna*, and *rajas negative guna*. This was the first study which empirically identified a fourth factor, i.e. *rajas*

negative. The results indicated positive correlation between *sattva guna* and leader-member exchange, work ethic, personal effectiveness, self-actualizing behaviour, and organizational effectiveness. *Sattva guna* had a negative correlation with least preferred co-worker construct. *Tamas guna* had a negative correlation with work ethic, personal effectiveness, self-actualizing behaviour, and organizational effectiveness. *Rajas* positive *guna* had a positive correlation with LPC score, work ethic, and self-actualizing behaviour, whereas *rajas* negative *guna* had a negative correlation with work ethic.

Daftuar and Anjuli (1997) studied the correlation between *triguna* and three variable - occupational stress, organizational commitment and job involvement. The results indicated a significant negative correlation between job involvement and occupational stress, significant positive correlation between *sattva* personality type, organizational commitment, and occupational stress; and no significant correlations in case of *rajas guna*.

Brown and Chatterjee (1999) emphasized that the *Guna* theory had a global relevance as a guide to managerial behaviour over Western management practices. According to the researchers, being an egotistic, contractual or follower of legal values were the parameters of Western management and *guna* theory has a profound relevance in explaining them. The study indicated that managers and managerial practices must have a spiritual level of understanding and sensibility, and values which inhibited purposeful action and developed moral judgement.

Sharma (1999) investigated the relationships between *triguna*, self-concept and job-satisfaction. The self-concept was measured by Self-Concept Inventory (Basavanna, 1975), job satisfaction was measured by the scale of Job-Satisfaction

(Daftuar, 1988) and a shorter version of the SRT scale (Pathak, Bhatt & Sharma, 1992) was used to measure *triguna*. The results indicated a positive correlation between *sattva* and self-concept. Significant positive correlation between self-concept and *rajas guna* and negative correlation between job satisfaction and *rajas guna* were found. *Tamas guna* had no significant correlation with self-concept and job satisfaction.

Biswas (2010) explored various *guna* constructs by using structural equation modelling. The study was conducted on participants from three 5-star hotels, one budget hotel, one leading retailer in India, and one multinational bank operating in India. The research work affirmed a framework that was more holistic and had the potential to explain the behaviour of Indian managers more profoundly.

Anuradha and Kumar (2015) used the method of multiple regression analysis to predict the relationship between the three *gunas* and organizational citizenship behaviour, job satisfaction, and job performance. Results indicated that a high *sattva guna* strongly predicted organizational citizenship behaviour and job performance but not job satisfaction. *Rajas guna* was the second best predictor and had negative correlation with organizational citizenship behaviour and job performance. *Tamas guna* did not predict organizational citizenship behaviour, job satisfaction or job performance.

Following studies found correlation between *triguna* and *karma yoga* and transformational leadership.

Narayan and Krishnan (2003) studied the relationship between *gunas*, *karma-yoga* and transformational leadership on a sample of 105 pairs of managers. Each of the three *gunas*- *sattva*, *rajas* and *tamas* was measured on ten dimensions- attribution,

leisure, food, praise, interests and criticism, sympathy, right and wrong. Results indicated that the three *sattva* dimensions i.e. accepting pain, sympathy and motivation to work had positive correlation with qualities of transformational leadership. Two dimensions of *rajas* i.e. attribution and right and wrong had negative correlation with *karma yoga*. *Karma yoga* and transformational leadership had no correlation.

Kejriwal and Venkat (2004) conducted an experiment to observe the impact of three *gunas* and *vedic* worldview (understanding of *maya* and belief in *karma*) on the magnitude of transformational leadership. The *gunas* were presented to participants by portraying a political leader as being high on one or two of the *gunas*. The *vedic* worldview was presented by portraying the leader as having or not having such a worldview. A multifactor leadership questionnaire was used to measure the five factors of transformational leadership, i.e. attributed charisma, idealized influence, inspirational leadership, intellectual stimulation, and individualized consideration. The results indicated that *sattva guna* enhanced transformational leadership, whereas *tamas guna* reduced it. *Sattva guna* and *rajas guna* together enhanced transformational leadership but their effect on enhancement of leadership was less compared to the effect caused by *sattva guna* alone. Similarly, *sattva* and *vedic* worldview together enhanced transformational leadership but not like *sattva guna* alone.

Vimala (2004) studied the managerial skills and personality development. Madhu and Krishnan (2005) studied the effect of transformational leadership and leaders' *Karma-Yoga* on Organizational Citizenship Behaviour (OCB) of followers. They measured five dimensions of OCB i.e. altruism, conscientiousness, sportsmanship, courtesy, and civic virtue for the followers through peer evaluation

questionnaire. The findings suggested that through the combined effect of transformational leadership and *Karma-Yoga*, altruism and conscientiousness were enhanced and civic virtue and sportsmanship were reduced.

Dhulla (2014) integrated the philosophy of *Bhagavad-Gita* with transformational leadership. The progressive development of the personality from *tamas* to *rajas* to *sattva* and their impact on Transformational Leadership were conceptualised. Elankumaran (2004) prepared a *triguna* personality inventory to study the relationship between personality types, organizational climate and job involvement. Findings suggested that the *tamas* type personality had a negative correlation with job involvement.

Following studies indicate relationship between different variables like creativity, need hierarchy and *triguna*.

Kumar and Thomas (2013) studied the relationship between *triguna* and the nature of creativity in 40 managers from different metropolitan cities of India. They used the IAS rating scale, and Wallach and Kogan verbal creativity test. The results showed that managers with *sattvic* personality were able to display their creative abilities outstandingly as compared to than other groups.

Daftuar and Sharma (1997) conducted a study on employees of public sector organization to analyse the relation between Maslow's need hierarchy and *Triguna*. The findings suggested that employees with dominant *sattva guna* work at "the self-actualization" level of need hierarchy, employees with dominant with *rajas guna* work at "self-esteem" level and employees with dominant *tamas guna* work at the "basic needs" level. Employees with dominant *tamas guna* had significant negative

correlations with higher order needs indicating lack of motivation to move to any higher levels of needs.

Information from ancient scriptures indicate different ways of understanding *triguna*. One of the oldest scriptures the *Atharva Veda* recognised *triguna* as temperament, and the *Svetasvataropnisad*, *Maitrayani Upanisad*, *Chandogyopnisad*, *Sankhya Karika*, *Vivekcudamani*, *Ayurveda* and *Mahabharata* have mentioned the elemental qualities of each *guna*. *Charak Samhita* and *Sushruta Samhita* have mentioned seven types of personality in *sattva guna*, six types of personality in *rajas guna* and three types of personality in *tamas guna*. The *Bhagavad Gita* has mentioned the qualities of the *triguna* in two categories i.e. behavioural and cognitive.

Since the beginning of the 1970s, modern psychologists conducted more objective and scientific investigations in the field of personality. The examples of modern studies include- representation of *triguna* as a ‘type model’ of personality, model development on *triguna* by integrating it with medical field, defining *triguna* under different terminologies and by means of inferential statistical methods like Principle Component Analyses constructing a six-factor personality structure. These studies have shaped a more systematic and wide frame of understanding *triguna* and establishing ‘type’ approach in Indian psychology.

1.4. Rationale for present research

Previous studies indicate that the *triguna* theory represents the ‘type’ approach to personality (Charak & Susruta; Das, 1987; Deo & Kulkarni, 2004; Krishnan, 2002).

This ‘type approach’ indicated that each *guna* represented a personality type with a set of unique qualities. That is, if an individual had a dominant *guna*-type, he has the set of qualities of only that dominant *guna*. This approach neglected the presence of

qualities of other two *gunas*. But *triguna* are inseparable and interdependent (B.G. 7.12). Qualities or traits were required to be recognized as independent attributes (Allport, 1937). Hence, the unique set of qualities of *Triguna* could discriminate between two personalities and provide a better representation of personality. The ‘trait approach’ magnifies the contributions of each trait in varying degrees. For example, the *rajas guna* consists of characteristics like ambition, passion, and boastful. A personality analysis in ‘type approach’ would measure the presence of *rajas guna* and indirectly imply the presence of ambition, passion, and boastful evenly. In ‘trait approach’ independent contribution of each trait i.e. ambition, passion, and boastful would be measured for understanding the personality.

The ‘SRT-Trait Model of Personality in Indian psychology’ is developed in the current study to measure the contributions of individual traits of *triguna* in formation of personality. From the classical Indian literatures the qualities of each *gunas* are derived and congregated as patterns of thoughts, feelings, and behaviours. This model suggests that individual differences lie in terms of differences in traits within each *guna*. On the empirical grounds, two highly objective methods, factor analysis and structural equation modelling are used for the statistical evaluation of these traits and the SRT-Trait model. According to the context of the SRT trait model, the ‘SRT-Trait Scale of Personality’ is developed and standardised.

1.5. Objectives

1. Conceptualizing the SRT-Trait Model of Personality in Indian psychology.
2. Developing SRT-Trait scale of Personality in Indian psychology for measuring the traits of *Triguna*.

3. Standardizing SRT-Trait scale of personality by establishing norms for the general adult population.
4. Identifying SRT-Trait based personality profile for various professions.
5. Identifying SRT-Trait based personality profile for males and females.

In the words of McAdams and Pals (2006), the goal of Personality psychology has been to provide an integrated framework for understanding a person as a whole while keeping in mind individual difference. Two perspectives of psychology, both Indian and Western, have made several attempts to accomplish such ambitious goals. In Western psychology, personality theories like Tripartite theory, Eysenck's Personality Theory, Cattell's Trait Theory and Allport's Trait Theory; descriptive methods like Self-report, life-history data and projective methods; and approaches like psychoanalytical approach, humanistic approach, behaviouristic approach etc. were few of such attempts. Among them, the Trait approach has been considered as contemporary, easy to implement and understand, objective and accentuated on measuring personality traits with statistical methods. It has a development and biological basis of existence (DeYoung, 2010).

Indian psychology has *triguna*, also known as three primal qualities of matter, as an ancient and the most distinguished concept of personality, explains the mind-body complex. As mentioned earlier, it is derived from *Rgveda*, and later adapted by *Atharva Veda*, *Sankhya Darsan*, *Yoga Darsan*, *Bhagavad Gita* and *Ayurveda*. The *Sankhya* philosophy of personality i.e. *triguna* theory has wide empirical and philosophical acceptance. According to *Sankhya Darshan*, every living and non-living being is made up of three *gunas*- *sattva*, *rajas*, and *tamas*. Different combinations of *triguna* form the basic elements of everything in this universe. So, all species of living and non-living beings are composed of same *triguna*, differing in their arrangements and combinations. *Sankhya karika* enumerated that *prakriti* is the carrier of *triguna*. *Sankhyan* philosophers characterize *prakriti* as the ultimate cause of universe and creation, as matter, *maya*, subtle and be visible only from its creations. Under the influence of *purusha*, the eternal spirit or pure consciousness, *prakriti* causes the

evolution of every form of living and non-living being in-universe. Each *guna* in *Triguna* has specific and unique characteristic qualities such as *sattva guna* has illumination, *rajas guna* has passion and *tamas guna* has inertia.

Among the modern studies, *triguna* as personality has been explored by various scholars. Sinha (1915) claimed *triguna* to be eternal and in permanent conjunction with one another. They are mutually overpowering, supporting, producing, and intimately mixing with one another. The *gunas* and their qualities were claimed to be inherited (June, 2001) like the mental and physical traits (B.G. 4.13; Saxena, 2016). Studies have deliberated *triguna* as the temperament that is biological nature of human being (*Atharva Veda* 8.12; Bahm 1970; Kapur, 2016). *Bhagavad Gita* (7.12) enumerates that three *gunas* are inseparable and have dynamic nature. An individual can oscillate between three *gunas* and their qualities under various physical, psychological and social influences. Changes in environment, surroundings, situations and family conditions could bring alterations in the dominance of any of the three *gunas* and their qualities. Studies by eminent scholars support the dynamic nature of *Triguna*. Wolf and Abell (2003) reported an increase in *sattva guna* by chanting *Hare-Krishna maha-mantra*; while Sedlmeier, Eberth, Schwarz (2014) linked the dominance of *sattva guna* with psychological well-being in comparison to *rajas* and *tamas guna*. Shilpa and Murthy (2012) branded *gunas* as psychological attributes responsible for the manifestation of behaviour and bringing differences in personality.

The studies of personality in Indian psychology have conceptualized *triguna* as type, traits, and temperament. They have highlighted the biological basis, dynamic nature and psychological nature of *triguna*, but have grappled minimally with the ‘characteristic qualities of *triguna*’ to formulate a model of personality. The absence

of such formulation of trait-based model led to the development of SRT-trait model of personality in Indian psychology. The next section would unfold the process of making of SRT-Trait model of personality in Indian psychology by exploring trait approach in Western psychology with studies and models.

2.1 Trait Approach in Western Psychology

In the light of trait approach, personality could be envisioned like a constellation of traits. These traits function as the basic unit of personality which manifest in habitual patterns of behaviour, thought, and emotion. For convenience the studies related to exploration of traits were clustered in current study in two groups.

The first group includes the studies that have defined characteristics of traits. Traits are the specific response to specific stimuli and a result of integration of numerous specific habits that were expressed as a characteristic mode of the individual's reaction to his surroundings (Perrin & Klein, 1926; Allport, 1927). These characteristics of traits helped in predicting behaviour and personality. In 1937, Allport added that traits were neuro-psychic structure that defined and manifested behaviour. Bouchard and McGue (2003), Fleeson (2001), Fleeson and Gallagher (2009), and Riemann, Angleitner and Strelau (1997) suggested that traits were probable descriptions of the frequency and intensity with which an individual exhibited various behavioural, motivational, emotional, and cognitive states. Individuals with a high degree of dominance of traits experienced its manifestation more often and more intensely than an individual with a low dominance of the same trait. For example a person high in Extraversion would be talkative, outgoing, and excited more often than someone low in Extraversion, but even the person low in Extraversion would experience those states occasionally (DeYoung, 2010). Hence,

traits are the pattern of behaviour, thoughts and actions and responses to specific stimuli.

The second group included studies related to the development of trait theories and models. Sir Francis Galton (1822-1911) was one of the first scientists who proposed a lexical hypothesis to identify personality traits. He suggested that significant characteristics of people can be reflected in form of words and such words can be used to define personality. Various psychologists turned to language as a source of attributes for a scientific taxonomy (Allport & Odbert, 1936; Baumgarten, 1933; Klages, 1926) because lexical hypothesis posits socially relevant and significant personality characteristics that were encoded in the natural language. Allport adapted lexical hypothesis for building a strong rationale for selection of attributes those defined personality (Matthews, Deary & Whiteman, 2009) and found 17,953 words in the English language which could be referred as personality traits (Hall & Lindzey, 1978). Allport and Odbert (1936) organized this list into four major categories- personality traits, temporary states, personal conduct and physical characteristics. Later, Allport classified personality traits into three main categories, cardinal traits, central traits and secondary traits. He claimed that only a small number of traits dominated a person's behaviour and these traits were Central Traits. The less influential aspect of a personality were the secondary traits, such as disliking being in closed spaces or crowds.

The list of trait names suggested by Allport influenced many researchers in trait psychology to look for more significant personality traits. Varied number of personality traits emerged down the line as an attempt to accurately define maximum aspects of personality, like Cattell's sixteen trait model, McCrae and Costa's big five and Eysenck's three-factor model.

Eysenck (1965 and 1967) developed an influential model of personality that determined personality traits in four levels of hierarchy. At the bottom of this hierarchy lied the specific behaviours, which vary according to stimuli and environment. Repetition of specific behaviours as a normal response made them habitual responses, the next in hierarchy. Habitual responses when repeated, formed another level in hierarchy i.e. lower order trait. The lower order traits on repetition formed super-trait or higher order traits, the highest level of a hierarchy. Eysenck gave three higher order traits- 1) extroversion-introversion, 2) emotional stability-neuroticism and 3) psychoticism. To understand the dynamics to these hierarchy levels, consider an example where Introversion, a higher order trait was a combination of lower order traits like shyness and habitual and specific responses like avoiding public settings, limit social activities, few friends etc. Eysenck related personality traits with the functioning of the autonomic nervous system and genetic inheritance (Eysenck & Eysenck, 1985).

Cattell (1950) defined personality as a predictor of what a person would do in a given situation. He categorised traits as- source traits and surface traits. He claimed that source traits were more influential than surface traits in describing a person. Cattell (1943) used Allport and Odbert's list for his multidimensional model of personality. As the size of the list was too large, Cattell (1943, 1945) reduced them into 4500 and then to 35 using semantic and empirical clustering procedures (John, 1990; John, Angleitner & Ostendorf, 1988). Cattell (1945) conducted several oblique factor analyses and obtained 12 personality factors, which eventually became part of his sixteen personality factors (John & Srivastava, 1999). He acclaimed a large number of surface traits like unselfishness, sharing, and non-greedy to form sixteen source traits like altruism through clustering. Source traits formed the structure of

personality and their knowledge provided predictions about behaviours (Engler, 2014). Cattell's pioneer work and the availability of a relatively short list of traits, stimulated other researchers to examine the dimensional structure of trait ratings (Ashton, Lee, Perugini, Szarota, Reinout, Di Blas, Boies & De Raad, 2004; John & Srivastava, 1999). Cattell and Eysenck differed on two grounds, firstly Eysenck's model of personality was based on neurotic and psychotic patients hence it was insufficient to comprehend the behaviour of normal people. Secondly, he emphasised the necessity of a large number of traits to get a complete picture of personality (Eysenck, 1991).

Fiske (1949) created a simplified descriptions of 22 traits from Cattell's list of traits which were highly similar to the Big Five.

Tupes and Christal (1961) re-analysed correlation matrices from eight different samples and found strong and recurrent five-factors. These five-factor structure of personality was replicated and postulated by Botwin and Buss (1989); Borgatta (1964); Conley (1985); DeRaad, Mulder, Kloosterman, and Hostee (1988); Digman and Inouye (1986); Digman and Takemoto-Chock (1981); Field and Millsap (1991); Goldberg (1981, 1990); John (1990); Norman (1963); Peabody and Goldberg (1989); and Saucier and Goldberg (1996b).

Costa and McCrae (1976) subjected Cattell's 16PF to cluster analyses and it resulted into three broad personality dimensions: neuroticism, extraversion and openness to experience. Later, they included agreeableness and conscientiousness and announced the Big Five dimensions of personality (Costa & McCrae, 1985; McCrae & Costa, 1987).

The above mentioned trait theorists believed that traits were inferred from patterns of behaviour and experiences, and cannot be directly observed. Hence, each of the big five factors had six facets to measure behaviour and experiences, and define personality. Traits were not evident to the same extent or had identical manifestations, but any trait could be observed in a subset of situations (DeYoung, 2010). The concept of a trait in Western psychology has been explained as a response to conditioned stimuli, an element of behaviour, motivation and cognition. Personality models based on traits were prepared using the lexicon method, hierarchical representation of traits, correlational matrices and cluster analyses. Trait approach to personality were well etched in Western psychology, unlike in Indian psychology.

As mentioned in the previous chapter, most of the studies on *triguna* has explained personality in a typological framework (consisting of three *gunas*) where the qualities of *triguna* are used as an adjunct to understand each type. A couple of studies have concluded *triguna* as traits. Few used the qualities of *Triguna* to prepare personality scales to measure *guna* (*sattvic*, *rajasic* and *tamasic*) personality. In the development of the SRT-Trait model of personality, the qualities of *triguna* were used and designated as traits of *triguna*. It is an effort to adapt trait approach (like Western psychology) in Indian psychology. The first step included a collection of 689 traits i.e. personality defining words from ancient scriptures and previous studies through lexical approach. These traits were abridged by the semantic method, text clustering method and factor analysis. Further, structural equation modelling analysed the empirical fitness of the ‘SRT-Trait model of Personality’. The following section contain details about the preparation of the conceptual framework of the Trait Model of Personality in Indian psychology.

2.2 The SRT-Trait model of Personality in Indian Psychology

In the ancient Indian knowledge tradition, personality has been referred as '*svabhava*'.

This term explained different facets of personality such as emotions, thoughts, feelings, behaviour and temperament. The *Upanishads*, *Sankhya darshan*, *Yoga Sutras*, *Bhagavad Gita*, *Ayurveda* and *Vivekchudamani* were selected as principle Indian scriptures because they explained personality through the *Guna* theory.

According to the *guna* theory, *purusha* and *prakriti* are the reason for the existence of every being and *prakriti* acts as a carrier of the three *gunas*. These three *gunas*- *sattva*, *rajas* and *tamas guna* govern the psychological and physiological processes of an individual. Each *guna* contains a few characteristic qualities, which are indicators of the presence of *guna* in behaviour. From the above-mentioned scriptures (in English and Hindi versions), traits of each *guna* were collected through the lexical approach i.e. use of natural language led to extensive, socially relevant, scripture dominant, specific and significant personality traits. For e.g. from the *sattva guna*, purity, illumination etc. were collected as *sattvic* traits. Appendix A on page 151 contains the list of traits. These traits were condensed in order to predict and measure specific behaviour in a given situation. In the following sections a detailed procedure of development of the theoretical framework of the 'SRT-Trait Model of Personality in Indian Psychology' is mentioned.

2.2.1 Lexical study of Traits of personality in Indian psychology

Various psychologists have turned to natural language as a source of attributes for scientific taxonomies (Allport & Odbert, 1936; Baumgarten, 1933; John & Srivastava, 1999; Klages, 1926), by extracting personality relevant terms from the dictionary. The natural language has been regularly used in daily interaction to define attributes of an individual. Hence, personality expressions recorded in the natural language offer an

extensive and finite set of attributes (Goldberg, 1981). Appendix A on page 151 contains 689 personality relevant terms from the *Sankhya Karika*, *Yogasutra*, *Vivekcudamani*, *Ayurveda*, *Bhagavad Gita* and previous studies on *triguna* as taxonomy of personality.

For a systematic organisation of these traits, they were sorted in following three categories- the first category included frequently mentioned traits, the second included set of similar meaning traits and the third category included those traits which weren't on the first and second category. Traits from the first category were reduced to singles. In the second category, traits with similar meaning were grouped as one term. Rest of the traits were put in the third category. After this sorting, the list contained 125 traits. After a discussion with the subject experts, the number of traits were recommended to be condensed using methods like text clustering. Text clustering is a scientific method to reduce these traits further in an organised, small and manageable number. Wei, Lu, Chang, Zhou and Bao (2014) found it a useful technique because it kept the semantic relation of words intact while reducing them to meaningful text. With this method, semantic relations between the traits were found in the current study. This semantic relation was formed considering the closest link that could connect them. So, these 125 traits were sorted in a way which was different to the traditional methods of categorizing as mentioned earlier in this section. The result of this sorting is mentioned below.

The five traits of *sattva guna* were formed by grouping traits that could semantically be related and whose inference could be interpreted in a common direction. The traits- stainless, purity in self, actions and thoughts, blissful, cheerful, follows *yama* and *niyam*, control over organs, firm, self-control, patience, unattached to worldly matters, absence of greed and generous were combined and grouped under

'*Sattvic* habits', because they influence behaviour or habits. This trait drives a person to maintain a clean and healthy body and mind (not because of any illness but by choice). Also, they prefer vegetarian and nutritious food.

Gentle, kind, non-egoistic and humble were conjoined as 'Empathy' because they hold a close meaning to empathetic behaviour. This trait drives a person to be understanding and affectionate to others and regulate their behaviour with patience and politeness.

The trait 'Maturity' contained traits – to have regulation of emotions, not acting on wishes, not moved by joy and sorrow, content, free from dejection, devoid of all expectations, virtuous, wise, compassionate, acts according to principles, courageous, modest, fearless, and eloquent. These qualities were combined as 'maturity'. This trait drives a person to be down to earth, modest, help and acknowledge the contributions of others and believes in the presence of spiritual forces as contributing in life.

Inclined to self-realisation, reads '*shastras*', devoted to God, practice austerities as guided by scriptures, serves the teacher and is attached to happiness were grouped under '*Sattvic* knowledge' because they indicate inclination for *sattvic* knowledge. This trait directs a person to understand the mysteries and purpose of life, and the materialistic world and spiritual world through reading and practice, to have faith in supreme power, feel connected to nature and the higher self and pay respect to living and non-living beings.

Calm, serene, tranquil, and peace-loving and stays away from spite were combined as 'Tranquillity' because together they define a sense of contentment. This trait brings a conscious self-regulation directed towards spirituality in a person. It

makes them regulate their desires, be self-satisfied and happy and maintain equipoise in situations like success, failure, happiness and sorrow.

Altruism (Keown, 2000; B.G.3.21) and non-violence (Subbarayudu, Rambai & RamaKrishna, 2012) are important aspects of *sattva guna*. They are included because of their significance in the *Bhagavad Gita* and the above mentioned two studies. The trait 'altruism' nurtures an unselfish regard for others and directs a person to perform *nishkaama karma*. It makes a person dedicated to the growth and welfare of others. The trait 'non-violence' brings lack of violence and aggression in speech, thought and actions of a person. They do not cause injuries to any living and non-living being.

The seven traits of *Rajas Guna* are Passion, Boastful, Opportunist, *Rajasic* Habits, Emotional Fluctuation and *Rajasic* Knowledge.

'Passion' consisted of following traits - action-oriented, attached to action, ambitious, passionate, and motivated. All these traits indicate a behaviour in which a person is full of plans and keeps shifting from one task to another before finishing previous plans. This trait brings high motivation for the achievement of wealth, fame etc.

'Boastful' consisted of- being proud of oneself, arrogant, egoistic and pretentious. These traits drive a person to talk highly about the own self and one's family achievements and material gains. They tend to display authority and only show concern about things that are related to their own self and significant others.

'Opportunist' consisted of- constantly planning new actions for one's self-interest only. This trait makes a person an opportunist, who tends to be selfish and

look for personal interest instead of the group. They apply values according to their own requirements.

'*Rajasic* habits' consisted of -putting faith in God for luxurious life, being full of desires, jealous, and envy. This trait brings in the tendency to put faith in Gods and demi-gods only to gain praise, honour and materialistic gains.

'Emotional fluctuation' consisted of – discontentment, intolerant and impatient, high on emotions specially anger, aggression, joy and sorrow. These traits bring extremity of moods, feelings and emotions in small fractions of time.

'*Rajasic* knowledge' consisted of - accepting knowledge that helps in earning materialistic pleasures, prays for self-gain only, wants to earn profit from every action, and stays attached to worldly things. These traits make a person inclined to materialistic desires and pleasures like being presentable and focused on making a good impression, spending too much money, showing inconsistency in eating and sleeping patterns.

Pessimism, *Tamasic* habits, Lethargy, Immorality, *Tamasic* Knowledge and Procrastination belong to *Tamas Guna*. These six traits of *Tamas Guna* were formed in the following manner:-

'Pessimism' was formed by grouping - disappointed, hopeless, and irrational. This trait brings a dominance of negative emotions, such as greed, anger, guilt, frustration, complaining nature and a gloomy view of the environment.

'*Tamasic* Habits' consisted of – a desire to get easy money, avoid hard work, practice austerity that are forbidden by scriptures, desires to hurt other beings without reason. This trait brings disorder and a lack of discipline in all spheres of life such as being addicted due to lack of knowledge and prefer stale, partial or overcooked food.

Torpid, lazy, inactive, inertia, lethargic, pass time by sleeping, dull and indolence were grouped as 'Lethargy'. This trait explains the lack of inclination for any activity in a person.

'Immorality' consisted of – unreliable, dishonest, deceitful, and immoral. This trait makes a person leap over moral values, become corrupt, exploit the law, be selfish and insensitive towards everything and not think of the welfare of the family.

'*Tamasic* knowledge' consisted of – ignorant, devoid of far-sightedness, delusional and obscure. This trait veils one's intellect and makes one a believer of dark knowledge, ghosts and black magic, perform austerity with an intention of causing pain and destruction to one-self and others.

'Procrastination' included - stay far behind time, postponing most of the tasks, taking more than the required time to complete a task, insubstantial in doing any work seriously and pays no attention to work. This trait makes one unwilling to take up responsibility and if taken then postpone it without any suitable reason.

Table 2.1 in Appendix B on page 165 showed the list of 19 traits as a result of the text clustering in brief. The Trait model of personality in Indian psychology was conceptualized with 19 traits. Operational definitions for each trait were mentioned in Table 2.2 in Appendix B on page 167. These operational definitions provided a functional pattern of each trait. These definitions were framed under the guidance of the supervisor and previously mentioned experts.

The knowledge and information of Indian psychology and Indian philosophy could not be thought without constantly referring to the ancient language in which they were written and practised. It was noticed during the whole time of the study, that English was not the only language in which the study could be conceptualized

and conducted. Hindi and Sanskrit language played a very important role in it. Hence along with English, Hindi (devanagari) language was used for naming the traits. This version was added after the traits were named in English. The purpose was to tap the essence of the Indian knowledge system.

The 19 traits provided the theoretical structure of SRT-Trait model of personality. However, theories and ideas were more acceptable with testing and experimentation (Ellis, Abrams & Abrams, 2009). Also, the study and research on human personality must include an objective and the empirical method to reach a point in which psychology is able to predict human behaviour more accurately. Thus, a questionnaire was prepared with items tapping the operational definition of 19 traits. With an appropriate set of data, collected with this questionnaire, several trials of oblique factor analyses were conducted to identify a stable structure of the trait model. The following chapter includes the methodology to check the empirical qualities of the theoretical SRT-trait model and development of SRT-trait scale of personality in Indian psychology.

The current study was conducted in four phases and with each phase objectives of the study were abided. In previous chapter, the first phase and the first objective were addressed i.e. conceptualizing the SRT Trait Model of Personality in Indian psychology. It involved an exhaustive study of the ancient literature and a process of ideation, identification and finalization of the traits to develop the model. The second objective and second phase included construction of the SRT-Trait scale of Personality in Indian psychology for empirical validation of the model. For this objective the following steps were implemented- item writing, item analysis, sampling and administration of the questionnaire and the exploratory factor analysis. From exploratory factor analysis, a cluster of traits and items were derived to form the final scale. This cluster of traits resulted in formation of a base model. In the third phase, the final scale was used to collect another set of data for confirmation of the base model. This was done by conducting confirmatory factor analysis i.e. structural equation modelling. In the fourth phase, the third and fourth objective of the research were fulfilled i.e. development of norms and preparing personality profiles according to professions and gender categories.

3.1. Phase one

The details about the development of the theoretical SRT-Trait model had been mentioned in Chapter 2. Operational definitions for the 19 traits were encoded in colloquial speech to prepare the items for SRT trait personality scale. The procedure is mentioned in the next section.

3.1.1 Item writing

A pool of items were prepared to tap the construct of each trait thoroughly. Each item was well-thought-out and written with simple and unambiguous words, easy syntax

and in statement format. This was necessary because poorly worded items introduce a potential source of error variance, reducing the strength of correlations among items and diminishing the overall objective of scale development (Worthington & Whittaker, 2006). The items were written taking cognitive and behavioural dimensions of each trait into context. Approximately seven to ten items were prepared for representing each trait. The English version of the draft was translated in Hindi and back translated by two language professionals. The scale had items in both Hindi and English language. Hindi was chosen as second language because of its wide usage over any native language. This gave a first draft of the SRT-trait scale with 159 items. It was then given to experts in the field of philosophy, psychology and Sanskrit for content validity as elaborated in next section.

3.1.2 Content validity of the inventory

Content validity is the measure of the legitimacy of items with respect to their content. The first draft of the SRT-trait scale was given to seven experts in the field for content validation. Of the seven experts, four experts had previously provided their guidance in the process of the identification and finalisation of the 19 traits. A brief introduction of these four experts is as follows – a) Ex-Vice Chancellor of The Maharaja Sayajirao University of Baroda, who has in-depth knowledge of Indian psychology; b) Retired Head of the Art History Department, The Maharaja Sayajirao University of Baroda who has a voluminous experience of teaching and research in Indian psychology; c) an Assistant Professor in the Department of Psychology, The Maharaja Sayajirao University of Baroda; d) practicing Ayurveda professional. Besides these four, two professors from the Department of Philosophy and one professor from Sanskrit Department of The Maharaja Sayajirao University of Baroda agreed to provide their guidance for validation. All seven experts were given the first

draft of the SRT-trait scale of personality with 159 items based on 19 traits, and their operational definitions (*see* Appendix C on page 169). Experts were asked to evaluate the items on following criteria-

1. To indicate whether the item was relevant and restricted to the operational definition of each trait, without any correspondence to other traits.
2. To indicate whether the item was clear in its communication with a least possibility of other interpretation.

Five out of seven experts suggested modification of fifteen items, elimination of seven items and accepted the remaining 137 items without any changes. Table 3.1(a) in Appendix D on page 185 had the list of items for modification and elimination. After deleting the seven items, modifying 15 items and adding 3 items (suggested by the experts), the scale consisted of 155 items. Table 3.1 (b) in Appendix D on page 186 contained the second draft of the SRT-trait scale of personality is attached. It was presented to the supervisor and experts for any further suggestions. After a week it was collected from them with an approval to use it for the data collection. The scoring pattern is mentioned in the following section.

3.1.3. Scoring pattern of the SRT-Trait Scale

The second draft of the SRT-Trait scale of personality had a five-point Likert scale scoring method. Each statement had five options as a response - Not at all, Little Bit, Sometimes, Most of the times and Always. The participants had to mark anyone of the responses according to the applicability of the item to their behaviour. The responses were coded as shown in Table 3.2. This coding does not imply any rank or order.

Table 3.2

Scoring pattern for Trait scale of personality

Not at all	1
Little bit	2
Sometimes	3
Most of the times	4
Always	5

This coding pattern was applicable to every item and there was no items with reverse scoring. The obtained scores were used for the item analysis (item discrimination and item-total correlation), exploratory factor analysis and reliability analysis. Details of these analyses are mentioned in section 3.3.

3.2. Phase Two

This phase includes the data collection for the exploratory factor analysis, the reliability of scores and the finalization of the scale for the confirmatory factor analysis.

3.2.1 Sample

The population within the age group 20-60 years and with graduation as the minimum educational qualification were targeted for drawing the sample. For a representative sample, data were collected from more than one city, i.e. Vadodara, Ankleshwar and Nagpur. The sample included the following professions- employees of private and government organizations, students pursuing higher education in different subjects, medical professionals, engineers, practitioners of law, administrative staff, clerks and

teaching professionals. A minimum of 500 participants were targeted for the sample, as it is the minimum recommended sample size for conducting a study on the general population (Gay, 2004). The permission letter duly signed by the Head of the Department of Psychology, The Maharaja Sayaji Rao University of Baroda, was obtained. The letter stated the purpose of the study, the sample size and an assurance to maintain confidentiality of data and use it for academic purposes only. Those organisations from Vadodara, Ankleshwar and Nagpur, which permitted the collection of data are listed below in Table 3.3.

Table 3.3

List of organisations

1.	Asian Paints Ltd., Ankleshwar
2.	Faculty of Arts, The Maharaja Sayajirao University of Baroda
3.	Faculty of Science, The Maharaja Sayajirao University of Baroda.
4.	<i>Gattu</i> Primary School, Ankleshwar
5.	Reliance Industries, Vadodara
6.	Persistence Pvt. Ltd., Nagpur
7.	Pioneer College of Physiotherapy, Vadodara.
8.	S.S.G. Hospital, Vadodara
9.	Sigma School of Engineering, Vadodara
10.	Sigma School of Physiotherapy, Vadodara
11.	Tikitar Industries, Vadodara
12.	Zenith School, Vadodara.
13.	Zydus Cipla, Ankleshwar

Note: EME School, Bright Day School and Sayajiganj police station in Vadodara did not grant any permission.

The data collected from above listed organisations was used for an exploratory factor analysis.

3.2.2 Data collection for the exploratory factor analyses

The participants were briefed about the research and their consent was taken. Then the questionnaires were handed to them. They had to fill in the demographic details before moving to the items. As per the instructions, participants had to read every item and check one of the options on the item's applicability to their behaviour. From Zenith School, Vadodara and Gattu School, Ankleshwar, 30 and 20 teachers respectively provided data. From Sigma School of Physiotherapy, Pioneer School of physiotherapy and SSG Hospital Medical College, 50 data sets were collected. From Sigma School of Engineering, Vadodara, 55 data sets were collected. From Tiki-Tar Industries and IPCL, Vadodara, 50 datasets were collected. From home-makers, 40 data sets and another 40 data sets were collected from software engineers of Persistent Pvt Ltd. Profession-wise distribution of data is presented below in Table 3.4.

Table 3.4

Sample distribution of 533 participants

Profession	No. of participants
Administrative professionals	125
Engineers	107
Home-makers	40
Medical professionals	88
Students	100

Teaching professionals	93
Total sample	553

Table 3.4 shows the sample distribution of 533 participants. Eighty-eight medical professionals included homeopathy practitioners, allopathic practitioners, nurses, resident doctors, physiotherapists and mental health professionals. A hundred and seven engineers included professional practitioner of engineering in the field of software, mechanical, electrical, electronic and civil. Ninety three teaching professionals included teachers of primary and secondary school and various departments of college and university. A hundred and twenty five administrative professionals consisted of administrative assistant, executive administrative assistant, secretary, clerk and front office manager. Forty home-makers included females who managed their household as a principal occupation. A hundred students consisted of students pursuing higher education in various disciplines. Of 533 participants, 203 were females and 330 were males. The dataset collected from above sample was coded and used to analyse the psychometric properties and exploratory factor analysis. The next section includes details about these properties.

3.2.3. Psychometric analysis

The initial psychometric analyses included the item analysis, where the item discrimination value and the item-total correlation were calculated. Items with appropriate item discriminative values and item total correlations were selected for Exploratory Factor Analysis (EFA) to determine latent factors. Lastly, a reliability coefficient of each factor was calculated by Cronbach Alpha. The sections ahead explain each of the above-mentioned analyses in detail.

3.2.3.1. Item analysis

Item analysis is a powerful technique available for establishing the adequacy of a scale and its items. It may greatly improve the effectiveness of the test items and the validity of test scores based on the item performance data for a newly constructed scale. Given below analyses include content validity, item difficulty and item validity (item discrimination).

For content validity, as mentioned in previous section the items were examined by experts. Item difficulty is an important factor because a high index indicates a difficult item and a low index indicates an easy item. This value is useful in ability tests but for personality inventories, item difficulty is not necessary (Sharma, 1990). Hence, item difficulty was not calculated. Item validity was assessed through 'item discrimination'. Item discrimination refers to the ability of an item to differentiate among participants with high disposition and low disposition on the same trait. The method included here was to select the 25% participants with the highest scores and the 25% participants with the lowest scores on each trait with the help of Quartile Deviation (Sharma, 1990). Once these two groups were formed, a t-test was used to compute the significance of the mean difference between the high and low group for each item of all traits. Table 3.5 in Appendix E on page 198 shows the item discrimination values obtained for all 155 items. The significance threshold was set at .05. All 155 items in Table 3.5 have satisfying discriminant value. The interpretation of abbreviates in the table are as followed: S1 to S7 represent seven traits of *Sattva Guna*, R1 to R6 represent six traits of *Rajas Guna* and T1 to T6 represent six traits of *Tamas Guna*. Items were given a prefix with respect to their respective trait. For e.g. item S1.1 represents the first item (1) of the first trait of *Sattva Guna* (S1). These abbreviations are used in following tables too.

The item total correlation was performed to check inconsistency of any item in the trait and thus discard it. As mentioned earlier, this analysis helps in eliminating ‘non-useful’ items from the trait group, before they are subjected to the factor analysis. Items with item-total correlation values greater than 0.30 are appropriate (Nunnally & Bernstein, 1994; Traub, 1994; Vaus, 2002) and must remain in the scale. The item-total correlation was measure by Pearson’s correlation between the scores of an item and its construct. Table 3.6 in Appendix E on page 205 shows the item-total correlation values. Table 3.6 shows that all items have acceptable item-total correlation value that is, more than 0.3 and they have positive correlation with their trait. For further analysis, they were subjected to the ‘Exploratory factor analysis (EFA)’.

3.2.3.2 Exploratory Factor Analysis

Exploratory Factor Analysis is one of the categories of factor analyses. It is used to identify and confirm a smaller number of factors or latent constructs from a large number of observed variables (Worthington & Whittaker, 2006). The other category of factor analysis is the confirmatory factor analysis, which confirms the factor model extracted in an exploratory stage. EFA is commonly used by researchers during the scale development to cluster items into common factors and interpret the factors according to their item loadings (Bryman & Cramer, 1999). It helps with one of the core questions– how many factors or constructs underlie the set of items? Before moving ahead to the EFA, a few of its important concepts such as factors and loadings and their acceptable values must be understood. A factor is a collection of items that are grouped according to their high correlation among each other. Loading refers to the measure of association between an item and a factor (Bryman & Cramer 2005). It is also referred as item loading or factor loading. According to rules set by Kaiser

(1960), items with low (≤ 0.3) loading value and factors with low Eigenvalue (≤ 1) should be rejected to get a better factor. Unrelated items, those which do not belong together or do not define the construct, should be deleted (Munro, 2005). A cross loading item with a loading of 0.3 or more should be removed from the analysis (Tabachnick & Fidell 2001; Worthington & Whittaker, 2006).

According to Gerbing and Hamilton (1996), exploratory factor analysis methods like principal-axis and maximum-likelihood are able to discover a correct factor model satisfactorily. So, an EFA with principal axis factoring and oblique rotation was used to identify latent factors in accordance with the traits of theoretical model of the SRT-trait model in Indian psychology. EFA assesses the construct strength during the initial development of an instrument (Worthington & Whittaker, 2006) and identifies the misfit items of an intended factor. The data collected from 533 participants were subjected to exploratory factor analysis. Appropriate Eigenvalues of factors and loading values of items were criteria to eliminate misfit items. The first trial with Principal component analysis and oblique rotation method with Kaiser Normalization, resulted in 42 factors, clustering 155 items. The result of the initial analysis could not be accepted because few factors had single items and few items had close cross-loadings over more than two factors. Repetitive factorization resulted in the elimination of 77 misfit items. The remaining 78 items were distributed into 18 factors that is, eight traits of *sattva*, three traits of *rajas* and seven traits of *tamas*. This empirical structure was different from the theoretical structure of the SRT-Trait model as new factors evolved when few items of the *rajas guna* traits pooled in with the *sattva* trait and *tamas* trait. Table 3.7 in Appendix E on page 212 presented these 78 items with their traits. The internal consistency was found appropriate for only 7 factors out of 18. The rest of the 11 factors had low-reliability

values. With the reliability values and the reduction in a number of appropriate traits from 18 to seven, a redo of the factor analysis was done. Worthington and Whittaker (2006) had mentioned that the process of scale development using EFA is a relatively dynamic process of examination and revision followed by more examination and revision. Number of EFA were carried out with Maximum likelihood and Principle axis factoring (Gerbing & Hamilton, 1996), Promax (Worthington & Whittaker, 2006) with Kaiser Normalization and suppressed value of coefficient < 0.3 . The items with cross-loadings or least contribution in the internal consistency were labelled as misfit items and deleted.

Gradually, 35 fit items distributed over 11 factors were retained with better factor solutions. Table 3.8 in Appendix E on page 216 shows these items for the final scale. Each factor had an appropriate Eigenvalue (≥ 1). Table 3.9 in Appendix E on page 218 presents the item loading of the 35 items distributed over 11 factors.

The EFA was started with 19 traits and 155 items. In the process, 120 items were found misfit and deleted, but a few items could unite themselves with items of different traits to form 11 factors. Given below are the 11 factors, with their item combinations, names and descriptions.

The first factor has items of *tamasic* habit, pessimism and *tamasic* knowledge. It describes the pessimistic outlook, faith in black magic to overcome problems and unhygienic habits. This factor is named '*Tamasic Knowledge*'.

The items of *sattvic* knowledge have spread across the second and fourth factor. The second factor consisted of few items of *sattvic* knowledge and few items of maturity. They imply the ability to understand and believe in supreme power. It is named '*Sattvic Knowledge*'.

The third factor contains items of *rajasic* knowledge, *tamasic* knowledge and immorality. They describe performing severe rituals and putting faith in Gods and demi-gods for acquiring materialistic gains, the fulfilment of wishes and easy money. This factor is named '*Rajasic Habit*'.

The fourth factor holds the remaining items of *sattvic* knowledge indicating an inclination towards spiritual knowledge for understanding the self, and improving thinking and living. It is renamed '*Sattvic Spirituality*' because items of *sattvic* knowledge merged with items of maturity to form the second factor.

The fifth factor contains items of *sattvic* habit, tranquillity and non-violence. They describe the capacity to control one's temper and maintain calmness. Hence, this factor is named '*Tranquillity*'.

The sixth factor holds the remaining items of maturity trait (few merged with *sattvic* knowledge). They imply to be modest and not driven by materialistic desires like money, fame, awards and success. So this factor is named as '*Maturity*'.

The seventh factor holds the remaining items of tranquillity and a reverse scored item of emotional fluctuation. Together, they describe a state of indifference and equanimity. As the fifth factor is already named tranquillity, this factor was given a new name – '*Emotional Stability*'.

In the eighth factor, items of altruism and empathy are checked. They indicate being compassion towards people without having any personal connection with them and even with the deprived. This factor is named '*Empathy*'.

The ninth factor contains items of *Sattvic* habit and a reverse scored item of *Tamasic* habit. They describe being considerate to one's physical health and having good organisation skills. This factor is named '*Sattvic habit*'.

The tenth factor contains items of lethargy and procrastination. They indicate having a sluggish and irresponsible behaviour. This factor is named '*Tamasic* habit'.

The 11th factor has items of passion and ambition. They indicate being zealous and busy. This factor is named 'Passion'.

Table 3.10 in Appendix E on page 220, shows the operational definition of 11 traits of the empirical SRT-trait model. Some of the items of the traits - maturity, composed, passion, lethargy, immorality and procrastination were removed from the SRT-Trait conceptual model, because they were found to be misfits in the empirical model. The reduction in the number of traits implies that a few traits are measurable only when combined with others. They have an independent theoretical identity but cannot be measured empirically. Each of the 11 traits explains behaviour, empirically stated as variance. Table 3.11 contains the variance, number of items and eigenvalue of each trait.

Table 3.11

Details about 11 traits

Sr. no.	Factor name	No. of items	Variance (in %)	Eigen value
1.	<i>Tamasic</i> Knowledge	7	13.141	4.599
2.	<i>Sattvic</i> Knowledge	4	23.133	3.497
3.	<i>Rajasic</i> Habit	5	30.026	2.412
4.	<i>Sattvic</i> Spirituality	4	35.300	1.846
5.	Tranquillity	3	39.895	1.608
6.	Maturity	2	44.237	1.520
7.	Emotional Stability	2	48.218	1.393

8.	Empathy	2	52.031	1.335
9.	<i>Sattvic</i> habit	2	55.592	1.246
10.	<i>Tamasic</i> habit	2	58.692	1.085
11.	Passion	2	61.682	1.047

Table 3.11 shows that all the 11 factors have Eigen values more than one and variance shared between the traits. The overall variance indicate that together, all the factors predict 61.68 % of behaviour.

3.2.3.3 Discriminant validity

According to Fornell and Bookstein (1982) discriminant validity is present when the variance shared between the construct and any other construct in the model is less than the variances that construct shares with its indicators. To measure the discriminant validity between the 11 factors, Pearson's correlation was used. Table 3.12 shows the variance shared between the 11 traits of SRT-Trait model.

Table 3.12

Variance shared between 11 traits

Factor	1	2	3	4	5	6	7	8	9	10	11
1	1										
2	-.223	1									
3	.186	.016	1								
4	.007	.403	.273	1							
5	-.271	.145	.124	.298	1						
6	-.060	.090	.010	.153	.227	1					

7	-.102	.003	.241	.150	.265	.051	1				
8	-.254	.302	.032	.280	.195	.144	.237	1			
9	-.019	.146	.024	.159	.111	.083	.149	.221	1		
10	.382	-.276	.160	.000	.021	.100	.030	-.121	.084	1	
11	.101	-.006	.122	-.008	.076	-.192	-.055	-.091	.047	.001	1

Table 3.12 indicates low correlational values between the traits, suggesting independence of each trait.

3.2.3.4 Reliability Analysis

Reliability refers to the ability of a questionnaire to consistently measure an attribute and to measure how well the items fit together, conceptually (Devon et al. 2007; Haladyna 1999). For a scale, the reliability refers to the extent to which the test is likely to produce consistent scores. The internal consistency method was used to examine the reliability of the complete SRT- Trait scale and each trait. Table 3.13 shows reliability for full scale and each of 11 traits.

Table 3.13

Reliability of 11 traits

Trait	Reliability (Cronbach Alpha)
1. <i>Tamasic</i> Knowledge	0.6
2. <i>Sattvic</i> Knowledge	0.8
3. <i>Rajasic</i> Habit	0.6
4. <i>Sattvic</i> Spirituality	0.8
5. Tranquil	0.7

6. Maturity	0.6
7. Emotional Stability	0.6
8. Empathy	0.6
9. <i>Sattvic</i> habit	0.6
10. <i>Tamasic</i> habit	0.6
11. Passion	0.6
Full scale	0.7

Table 3.13 shows the reliability of full Trait Scale and each factor measured by Cronbach alpha. The full scale reliability value is 0.7, indicating a good and consistent reliability of the items for a newly formed questionnaire (DeVellis 1991; Devon et al. 2007). The reliability of the 11 factors ranged from 0.6 to 0.8 indicating them to be good and reliable. This scale was finalized for the data collection from 1000 participants. The data so collected would be subjected to a confirmatory factor analysis to confirm the 11 factor model.

3.3. Phase three

A Confirmatory Factor Analysis (CFA) is performed to validate the empirical model evolved from EFA. Performing EFA and CFA in different data sets yields a generalizability of the model and conducting both EFA and CFA on the same data reduces such a possibility. Thus, the third phase includes data collection for Confirmatory Factor Analysis (CFA).

3.3.1. Data collection for Confirmatory factor analysis

The SRT trait scale with 35 items was used for collecting data and establishing norms.

A sample of 1000 participants is considered excellent for a confirmatory factor

analysis (Comrey, 1973). As the sample size was larger than the first data collection (see section 3.2.1.), more organisations were approached. The characteristics of the population and procedure of administration of the scale remained similar to the initial data collection. In addition to the previously mentioned organisations (as in the first data collection), the data collection was extended to professional and educational organizations in Nagpur and Sagar (M.P.). Details of the organisations and the targeted population are mentioned in Table 3.14. A prior verbal consent from authority of organisations was taken to publish this list for academic use only.

Table 3.14

List of organisations for second data collection

	Name of organisation	Population
1.	Bank of Baroda, University campus branch, Vadodara.	Bank employees
2.	Centre for Advanced Studies and Department of Psychology in The Maharaja Sayajirao University of Baroda, Vadodara.	Research scholars
3.	Civil court and family court, Vadodara.	Lawyers
4.	Department of Chemistry, Criminology, Biology, Physics and Psychology, Hari Singh Gaur University in Sagaur, Madhya Pradesh.	Professors, lecturers, research scholars and students of Master programme
5.	Department of dermatology, obstetrics and gynaecology Sir Sayajirao Gaekwad (S.S.G.) Hospital, Vadodara.	Doctors
6.	Experimental school, The Maharaja Sayajirao university of Baroda, Vadodara.	Teachers and principal
7.	Four Nagar palika schools, Vadodara	Teachers and the Principal
8.	GUVNL, Vadodara.	The engineers, clerks and Administrative professionals
9.	Life Insurance Cooperation India Ltd, Vadodara	Administrative professionals

10.	MGVCL, Vadodara.	The engineers, clerks and Administrative professionals
11.	Persistent Pvt. Ltd., Nagpur	Software engineers and members of administrative staff
12.	Pioneer College of Physiotherapy, Vadodara.	Physiotherapists (practitioners and lecturers)
13.	Pioneer School of Homeopathy, Vadodara.	Homeopathy doctors and students in final year of masters
14.	Pioneer School of Nursing, Vadodara.	Nursing staff, students of Master's Program
15.	Sigma School of Bio-Chemistry, Vadodara.	Professors of college and the students of Master's Program
16.	Sigma School of Engineering, Vadodara.	Professors of college and the students of Master's Program
17.	Sigma School of Physiotherapy, Vadodara.	Physiotherapists (practitioners and lecturers)
18.	Tikitar Industries, Vadodara.	The members of administration, accounts and front office.

The authorities of every organisation mentioned in table 3.14, were approached with a permission letter for data collection authorized by Department of Psychology, The M.S. University of Baroda. The letter included the purpose of

research, sample size and confidentiality rule. After receiving verbal and written consent from the authorities of organisation and participants, a suitable date was fixed with them for collection of data. The consent form is attached in Appendix C on page 183.

The employees of MGVCL and GUVNCL have a common building, functioning from different floors and cubicles. Amongst them, 250 engineers, 200 members of the administrative staff and 30 members of the clerical staff were given the SRT-trait scale. On the next day, 110 engineers, 100 members of the administrative staff and 30 members of the clerical staff returned the questionnaire. A day later, 90 engineers and 50 members of the administrative staff returned the questionnaire, and remaining 50 engineers and 50 members of the administrative staff had misplaced their questionnaires. From the total data collected from MGVCL and GUVNL, 12 data sets of the engineers, 100 of administrative staff and 20 of clerical staff were discarded, because they left 20-30 items unanswered. The final number of usable data was 188 from the engineers, 50 from the administrative staff and 10 from the clerical staff of MGVCL and GUVNL.

Authorities of Shikshan Samiti, Govindrao Madhyavati shala, Vadodara were approached with an application to allow the data collection from teachers of Nagar Nigam Palika (government school), Vadodara. After a week, the permission was granted for three schools in Fatehganj and one school in the Nizampura area. Each school had the same number of staff members - ten teachers, one headmistress, one or two members of the clerical staff and one or two peons. All the teachers and the principal were informed about the research and the scale was handed to them. After a couple of days, the same were collected back. Similarly, Principals (Gujarati medium and English medium) of the Experimental School, The Maharaja Sayajirao University

of Baroda were approached and within a couple of days, the data from 20 teachers were collected. In total a data set of 60 teachers were collected and coded.

Fifteen research scholars of the Faculty of Education and Psychology, The Maharaja Sayajirao University of Baroda agreed to participate and requested a soft copy of the scale. Within a day, the data was received from all.

Fifty Administrative professionals of the Life Insurance Cooperation of India, agreed to participate as subjects in the research. In a day's time, they returned the scale with all items attended to. One of the officers requested a soft copy, so the data was collected through email from him.

Lawyers in Nyaya Mandir i.e. session court and family court of Vadodara were approached. Of the lawyers present, 90 agreed to participate. Three lawyers requested for a soft copy of the scale and a personality analysis report. It took two to four days, to distribute and collect the scale. Including the soft copies, 82 were usable and 8 were discarded for the same reasons as mentioned above.

Data from 120 students of the master program and 50 medical professionals were collected from the Homeopathy, Nursing and Physiotherapy School of Pioneer College. Data of 30 physiotherapists were collected from the Sigma College of Physiotherapy and 50 of professors of Engineering School of Pioneer College were collected.

From the Physics, Biology and Chemistry departments of the Hari Singh Gaur University, Sagar, M.P., data sets of 50 professors and 50 research scholars were collected. Further, from Sociology, Criminology and Forensic Science departments, data sets from 40 professors, 20 research scholars and 110 students of the master programme were collected. The total data collected was- 90 professors, 70 research

scholars and 110 master's students. Out of this total, 25 data sets of research scholars were discarded for the same reasons as mentioned above.

From Persistent Pvt. Ltd., Nagpur, data from 100 computer engineers and 3 members of the administrative staff were collected in soft copy format.

In the S.S.G. Hospital, Vadodara, three doctors and two resident doctors of dermatology and five resident doctors of obstetrics and gynaecology agreed to participate. Due to time constraint, none of them was able to attend to the scale.

Another 23 data sets were collected from home-makers, 21 from psychologists. The latter was included in medical professionals group due to the proximity of professions.

It took nearly, eight to nine months to collect data from 1018 participants.

Table 3.15 shows the number of people in each profession.

Table 3.15

Sample distribution of 1018 participants

S. No.	Groups	Total no. of Participants
1.	Administrative professionals	257
2.	Engineers	107
3.	Home-makers	22
4.	Lawyer	96
5.	Medical professionals	101
6.	Self- employed	42
7.	Students	229

8.	Teaching professionals	164
	Total	1018

Table 3.15 shows the sample distribution of 1018 participants. A hundred and one medical professionals include homeopathy practitioners, allopathic practitioners, nurses, resident doctors, physiotherapists and mental health professionals. A hundred and sixty four teaching professional include teachers of primary and secondary school and various departments of college and university. A hundred and seven engineers include professional practitioners of engineering in the field of software, mechanical, electrical, electronic and civil. Ninety six lawyers include practitioners of law such as advocates and public notaries. Two hundred and twenty nine students consist of students pursuing higher education in different disciplines. Two hundred and fifty seven administrative professionals consist of administrative assistants, executive administrative assistants, secretaries, clerks and front office managers. Twenty two home-makers include females who managed their household. Forty two self-employed people include freelance artists, entrepreneur and businessmen. The number of males and females in total sample is 539 and 479 respectively. The data set of 1018 participants was subjected to Structural Equation Modelling to check the goodness of fit for the empirical SRT-trait model with 11 traits and to establish norms for the SRT-trait scale. The fourth phase details the procedure for this.

3.4 Phase four

This phase includes Structural Equation Modelling as a tool for the Confirmatory Factor Analysis to check the model fitness indices of the 11-factor model that emerged in the EFA. Descriptive information of the fit indices is mentioned along.

3.4.1. Structural Equation Modelling and Confirmatory Factor Analysis

Worthington and Whittaker (2006) stated that the CFA is most commonly used for the validation of a scale following an EFA. Structural Equation Modelling (SEM) is a tool used widely for CFA. SEM gives an empirical base to models within the social and behavioural sciences (Martens, 2005; Martens & Hasse, 2006; Quintana & Maxwell, 1999; Weston & Gore, 2006). Arbuckle (2006) has stated that Structural equation modelling (SEM) is most commonly thought of as a hybrid between a regression and some form of factor analysis. It allows one to perform some type of multilevel regression on factors. However, the primary goal of SEM is to determine and validate a proposed causal model. Therefore, SEM is a confirmatory technique (Raykov, 2005). For SEM, two main goals are set. First, to understand the patterns of correlation/covariance among a set of variables, and second, to explain as much of their variance as possible with the model specified (Kline, 2010). In typical SEM, the factor structure obtained in the EFA undergoes a confirmatory procedure to obtain a good fit of the model, and to support the factor structure reliability and validity of the scale. Another approach is to compare competing for theoretically plausible models (e.g., different numbers of factors, inclusion or exclusion of specific paths); in other words, the factor structure uncovered in the EFA can be compared with alternative models to evaluate which model fits the data best (Worthington & Whittaker, 2006). Due to the absence of any *Triguna* Trait model of personality in Indian psychology, such an attempt was not possible for current study. The 11-trait model formulated in the EFA was tested for its model fitness in SEM with 1018 data sets.

The statistical theory underlying SEM assumes that large sample sizes are necessary to provide stable parameter estimates (Bentler, 1995). The minimum sample size for SEM is 100 (Worthington & Whittaker, 2006).

Conducting Structural Equation Modelling (SEM):

Schumacker and Lomax (1996) have suggested that SEM shall begin with (1) reviewing the relevant theory and research to support the model and preparing a structure of the model in form of a diagram or equations; (2) collecting data and conducting preliminary descriptive statistical analyses for estimating parameters in the model; (3) assessing model fit indices; (4) defining the meaning of the model and (5) finally, interpreting the model fit indices. The first two suggestions were met as mentioned in the previous sections. For the rest of the suggestions, the 11 factors as formulated in the EFA were subjected to SEM for CFA. Figure 3.1 explains the resulting structure, in which ‘rectangles’ represent observed variables and ‘ovals’ represent latent variables. Every observed variable has an error linked to it to measure its error variance. To analyse the fitness of the 11-trait model, a dataset of 1018 participants were used. Figure 3.1 shows the representation of the 11-trait model.

Figure 3.1. The empirical 11- factor model

The structure of model formulated in EFA contains the 11 traits which were conceptualized as unobserved factors and items which were conceptualized as

observed factors. Model fit indices were classified as incremental, absolute, predictive or parsimonious fit indices (Kline, 2005).

Absolute fit indices measures the ability of a structural equation model in explaining the relationships, found in the sample data. The absolute fit index contains Discrepancy Chi-Square, Root Mean Square of Error Approximation (RMSEA) and Goodness Fit Index (GFI), and their acceptable values are $p > 0.05$ (Wheaton, Muthen, Alein & Summers, 1977), $RMSEA < 0.08$ (Browne & Cudeck, 1993) and $GFI > 0.90$ (Joreskog & Sorbom, 1984) respectively.

Incremental fit indices measures the improvement in a model's fit to the data by comparing a specific structural equation model to a baseline structural equation model. The typical baseline comparison model is the null (or independence) model in which all the variables are independent of each other or uncorrelated (Bentler & Bonnett, 1980). The incremental fit index contains the adjusted goodness of fit (AGFI), comparative fit index (CFI), Tucker-Lewis index (TLI) and normed fit index (NFI). Their acceptable values are $AGFI > 0.90$ (Tanaka & Huba, 1985), $CFI > 0.90$ (Bentler, 1990), $TLI > 0.90$ (Bentler & Bonett, 1980) and $NFI > 0.90$ (Bollen, 1989).

Predictive fit indices or parsimony fit measures the fitness of structural equation model in other samples from the same population through Chi sq/df value. It must be less than 5 to be acceptable (Marsh & Hocevar, 1985).

It is highly recommended to use these three fit measures by including one index for each category for determining the model fit (Hair, 2010; Holmes-Smith, 2006).

Table 3.16 gives a summary of the model fit indices for the SRT-trait model of personality along with the acceptable standards.

Table 3.16

The model fit indices for SRT-trait model of personality

Fit measure	Index	Literature	Acceptance level	Acceptable standard	SRT-trait model
Absolute fit	Discrepancy Chi Square- Chi sq	Wheaton, Muthen, Alein and Summers (1977)	$P > 0.05$	Sensitive to sample size > 200	1048.460 at $p=0.000$
	RMSEA- Root Mean Square of Error Approximation	Browne and Cudeck (1993)	RMSEA < 0.08	Range 0.05 to 0.10 acceptable	0.034
Incremental fit	CFI Comparative Fit Index	Bentler (1990)	CFI > 0.90	CFI = 0.95 is a good fit	0.91
	TLI - Tucker- Lewis Index	Bentler and Bonett (1980)	TLI > 0.90	TLI = 0.95 is a good fit	0.9
Parsimonious fit	Chisq/df- Chi Square/Degrees of Freedom	Marsh and Hocevar (1985)	Chi sq/df < 5.0	The value should be below 5.0	2.160

Table 3.16 shows the model fit indices for the empirical SRT-Trait model. The indices in all the three categories are in accordance with the acceptable standards. According to Hipp and Bollen (2003), if the model has ‘good’ fit indices then the power to detect discrepancies from predictions are amplified. The chi-square test statistic is used to test the overall model fit in SEM (Worthington & Whittaker, 2006), and according to Kline (2005) findings reported in SEM consist of (a) the chi-square test statistic with corresponding degrees of freedom and level of significance, (b) the RMSEA (Steiger & Lind, 1980) with its corresponding 90% confidence interval, and (c) the Comparative Fit Index (CFI; Bentler, 1990). Other alternative fit indices that evaluate model fit could also be considered.

This chapter provides details about the development of norms (stanine norms) for the standardization of the SRT trait scale of personality in Indian psychology. These stanine norms are prepared for the general population, males, females, and professional groups.

4.1. Development of the norms

The true value of data is revealed when the individual scores are related to the scores of the entire group for an appropriate comparison and norm-referenced scores bring this value to data. A stanine (standard nine) score is a simple and reliable way to scale test scores or raw scores on the nine-point scale. It is a method to convert any test score to a single-digit score. They are distributed on a continuum of one to nine, in which nine is the highest stanine and one is the lowest stanine. The properties of stanine scores are quite similar to the properties of the normal distribution curve. Therefore, stanine scores can be treated like the normal distribution curve. Stanine scores were chosen because they are simple to understand and can be expressed through one-digit whole numbers.

Figure 4.1. Similarity between Normal Probability Curve and Stanine scores

The scores of the top four percent of the participants in a normal distribution curve were assigned to a stanine score of nine, the next seven percent to a stanine of eight, and so on (see Table 4.1 for understanding stanine distribution). The stanine scores are helpful for the professionals to make a qualitative decision regarding the raw score.

Table 4.1

Relation between stanine and normal distribution curve

Stanine	1	2	3	4	5	6	7	8	9
Percentage	4	7	12	17	20	17	12	7	4

The data of 1018 participants is been used for establishing stanine scores for three categories: 1) norms for the general population, 2) norms for following profession groups- students, teaching professionals, administrative professionals, engineers and medical professionals and 3) lastly, norms for males and females.

4.1.1 Norms for the general population

Establishing norms is the ultimate purpose of standardization of a test (Ferguson, 1981), hence stanine scores for the general population were developed. The following interpretation of stanine scores holds true for all the subsequent norm tables. Stanine one to three represent a low degree of presence of the traits. Stanine four to six represent a moderate degree of presence of the traits. Stanine seven to nine represent a high degree of presence of the traits.

The 1018 participants of the study have an age range of 20 to 65 years and an average age of 35.42. Table 4.2 on Appendix F on page 222 shows the conversion of

the raw scores on each trait to stanine scores for general population. For convenience and practical use, these stanine scores are compressed in Table 4.3 on Appendix F on page 223.

4.1.2. Norms for the professional groups

Rathvon (2004) suggested that while establishing norms for the general population, a review of the subgroups was relevant. This helps in comparing an individual's performance with that of his or her gender or professional peers rather than comparing it only with the general population. Therefore, the sample of 1018 participants was sorted into eight professional groups- students, teaching professionals, administrative professionals, engineers, medical professionals, lawyers, self-employed people and home-makers.

Figure 4.2. Distribution of 1018 sample according to professions

The representative size of the sub groups for establishing norms should be at least 100 participants per subgroup, in accordance with the criteria set by Alfonso and

Flanagan (1999). The number of participants in three professional groups, namely lawyers, self-employed and home-makers were insufficient. Hence, norms for these three groups were not prepared. Given below are the norms for five professional groups- students, teaching professionals, administrative professionals, engineers and medical professionals.

The first group consists of 229 students pursuing their higher education (25.50% of the total sample), who are in an age range of 20 to 35 years. The average age of this group is 24.04. Table 4.4 in Appendix F on page 224 shows the conversion of the raw scores to stanine scores. Table 4.5 in Appendix F on page 225 shows compressed stanine scores of the same group for convenience and practical use.

The second group consists of 164 teaching professionals, basically teachers from primary school, secondary school and universities (16.11 % of the total sample). Their age range is 23 to 65 years and the average age is 35.05. Table 4.6 in Appendix F on page 226 shows the conversion of the raw scores to Stanine Scores. Table 4.7 in Appendix F on page 227 shows the compressed stanine scores of the same group for convenience and practical use.

Participants in the third group are 257 administrative professionals of class I, II and III working in the government and private organisations of Vadodara (25.25% of the total sample). They ranged in age from 20 to 69 years, with a mean age of 43.59. Table 4.8 in Appendix F on page 228 shows the conversion of raw scores to stanine scores. Table 4.9 presents the compressed stanine scores of the same group in Appendix F on page 229 for convenience and practical use.

The fourth group consists of 107 software, mechanical and electrical engineers (10.51% of the total sample). Participants ranged in age from 22 to 62, with a mean

age of 39.60. Table 4.10 in Appendix F on page 230 shows the conversion of raw scores to stanine scores. Table 4.11 in Appendix F on page 231 present the compressed stanine scores of the same group for convenience and practical use.

The fifth group consists of 101 professionals from the field of medicine, nursing, physiotherapy, homoeopathy and mental health (9.92% of the total sample). The age of the participants ranged from 21 to 62 years and their average age is 28.83. Table 4.12 in Appendix F on page 232 shows the conversion of raw scores to stanine scores. Table 4.13 in Appendix F on page 233 present the compressed stanine scores of the same group for convenience.

The sixth group consists of 96 professionals from the field of law. The age of the participants ranged from 25 to 64 years and their average age is 42.88. The seventh group consists of 42 self-employed people. The age of the participants ranged from 22 to 62 years and their average age is 33.78. The eighth group consists of 22 homemakers. The age of the participants ranged from 25 to 57 years and their average age is 40.95. As mentioned earlier, the table of conversion of raw scores to stanine scores for the lawyers, self-employed people and homemakers were not prepared.

4.1.3. Norms for Gender

Like the professional groups, subgroups of gender were sorted to establish norms. From the 1018 participants, 52.94 % were males and 47.05% were females. The number of participants in each gender group was appropriate to establish norms (Alfons & Flanagan, 1999).

Figure 4.3. Distribution of 1018 sample according to genders

The 539 male participants have an age range from 20 to 65 years and a mean age of 38.65. Table 4.14 in Appendix F on page 234 shows the conversion of raw scores on each trait to stanine scores for males. Table 4.15 in Appendix F on page 235 shows compressed stanine scores of the same group for convenience and practical use.

The 497 female participants have an age range from 20 to 65 years, with a mean age of 31.77. Table 4.16 on Appendix F on page 236 shows the conversion of raw scores to stanine scores for females. Table 4.17 in Appendix F on page 237 shows compressed stanine scores of the same group for convenience and practical use.

4.2. Conclusion

In this chapter, raw data were standardized to establish norms for the 11 traits of the SRT-trait scale of personality. Norms were established in terms of Stanine-Scores for the general population, gender and five professional groups (academician, administrative personnel, medical professional, engineers and students).

The next chapter comprises of personality profiles based on the professional groups and gender groups, and analyses to find the difference among the eight groups of professionals and between both the genders on the basis of traits.

This chapter provides a general interpretation of the 11 traits and interpretation of specific profiles. The general interpretation includes the general information of each trait and their explanation for low and high scorers. The profile interpretations include graphical representations of the personality profiles and their description for the general population, a group of Students, Medical professional, Engineers, Teaching professionals, Administrative Professionals, Males and Females. These personality profiles and the general descriptions of the specific traits will be helpful in interpreting SRT-Trait scale results and comparing individual personality profiles with the general population and subgroups.

5.1. General interpretation of the 11 traits

The interpretation of specific traits is based on the operational definitions of each trait as mentioned in Table 3.10 in Appendix E on page 219. The high, moderate and low range of the scores on each trait is interpreted by calculating and converting the raw scores into stanine scores with the help of stanine score tables on Appendix F, for general population and sub groups. The high or low scores of each trait should not be assumed as ‘good’ or ‘bad’.

The interpretative information for each trait as high and low is given in the following sections. The interpretation of moderate range for each trait is mentioned in section 5.2.

Trait 1: *Tamasic* Knowledge

General meaning

Tamasic knowledge addresses the tendency of enduring unhygienic habits like not brushing teeth regularly. People high in *Tamasic* knowledge have a pessimistic

outlook on life and believe in solving problems with superstitious beliefs. They tend to have behavioural and cognitive manifestations of this trait.

Interpretation

High scorers on this trait show a continuous practice of unhygienic habits. They might have a gloomy, negative and cynical outlook on various life situations, and hold beliefs that state that superstitious practices can be used for solving problems in life. People with low scores on this trait might show unhygienic habits but much less than those who score high or moderate. This does not mean the complete absence of such practices. They can also have a pessimistic outlook on life situations and hold superstitious beliefs for problem solving, but much less than high and moderate scorers.

Trait 2: *Sattvic* Knowledge

General meaning

Sattvic Knowledge indicates the capability to understand and believe in the presence and characteristics of 'supreme power'. People with a high *Sattvic* Knowledge have faith in supreme power and let it guide their behaviour and thought processes to do righteous deeds.

Interpretation

People who score high in *sattvic* knowledge believe in the presence of supreme power and its functioning in this world. They have the maturity to understand their life beyond the materialistic world and look for the purpose of life. Their behaviour and cognition are guided by *sattvic* knowledge. People who score low on this trait might believe less in the presence and functioning of supreme power. They do not have the

same maturity as high scorers in understanding that life has a dimension beyond the materialistic world and one should aim to find one's purpose of life.

Trait 3: *Rajasic* Habit

General meaning

Rajasic Habit involves the extent to which one worships Gods, demi-gods and performs severe rituals in order to fulfil personal wishes and get easy money. Moral ideas of right and wrong are manipulated and culture tailored standards of living are used which focus on personal benefits. These moral ideas and standards of living enable behaviour that centres on materialistic gains.

Interpretation

People who score high in *Rajasic* habit tend to perceive themselves as strict followers of religious rituals to please Gods and demi-gods. They validate conventional and unconventional cultural and religious rituals as important regulation for material prosperity. People who score low in this trait tend to be lenient in performing such severe rituals and perform them only due to a poorly developed sense of conscience. They have difficulty in conforming to the rituals, unlike high scorers.

Trait 4: *Sattvic* Spirituality

General meaning

Sattvic Spirituality focuses on people's motivation to come closer to experience spirituality by reading spiritual scriptures and books, and by attending spiritual discourses by scholars. They intend to spiritually nurture their thinking and lifestyle, and reflect intensely on their inner life, more than on the outer environment. Their goal in life is to attain self-awareness through spirituality.

Interpretation

The high scorers in this trait tend to indulge in reading spiritual scriptures to satisfy their thirst for the true knowledge of self. They experience an improvement in their thinking and living as they go from a materialistic living to spiritual enlightenment.

The low scorers seldom indulge in spiritual readings. Their inclination towards gaining information and spiritual experience is low. They do not have a drive for knowledge in order to discover their true self. They do not hold an experiential knowledge of spirituality which could change their way of thinking and living.

Trait 5: Tranquillity

General meaning

Tranquillity refers to the ability to control one's temper and maintain calmness in difficult situations.

Interpretation

People who score high in this trait say that they feel calm and composed at most times and places in their life. They are able to control their temper in challenging situations.

People who score low say that they can seldom control their temper or stay calm.

Trait 6: Maturity

General meaning

Maturity addresses the ability to be modest, down-to-earth and not driven by materialistic desires. It also describes the ability to understand the temporary nature of the desire for money, fame, and awards, and that one must not run after them for happiness. People with high maturity are not strongly attached to their actions and the following results.

Interpretation

High scorers in the maturity trait behave modestly with everyone. They do not credit themselves for success or achievements. This does not mean they have a low self-esteem, instead they are mature enough to understand that success or failure are temporary situations. They do not find themselves running after materialistic desires for happiness. They display wisdom in their behaviour and thoughts. Low scorers in this trait, rarely display modesty and believe in making their success or failure noticed to others. They run after materialistic desires for happiness.

Trait 7: Emotional Stability

General meaning

This trait concerns the management and balance of emotions. It addresses a state of equanimity and detachment to everything and everyone.

Interpretation

High scorers tend to stay indifferent and detached of all emotions. They can experience emotions but do not indulge in any emotional desires. They rarely experience emotional problems which they cannot cope with. They have a good self-control over their emotions in most situations and can come out of any negative or positive emotional situation quickly. Low scorers are emotionally volatile, experience frequent mood fluctuations and have more emotional dissatisfaction than others. They are unable to manage their emotions and situations that required composure. They feel controlled by situations instead of having control over situations.

Trait 8: Empathy

General meaning

This trait focuses on people's sensitivity and compassion for every living being. They have empathy and a sensitive attitude towards other people without having any personal connection with them. They have concern for people who are deprived in social, physical or economic aspect.

Interpretation

People with a high score say that they have empathetic feelings for people who are neglected and deprived, members of their family, friends and those with whom they do not have any personal connection. People with a low score are less sentimental, sensitive and compassionate towards others. They tend to focus on an objective view of the situation or people.

Trait 9: *Sattvic* habit

General meaning

The idea of consuming food of good quality is considered parallel to a healthy personality in Indian psychology. *Sattvic* habit refers to being attentive and disciplined towards one's lifestyle and nutrition in order to stay healthy. It describes people who are skilled in creating clean and ordered environments.

Interpretation

People with high scores are disciplined in their food habits. They pay attention to the quality and quantity of the food they consume. They like well-organised things.

People with low scores pay less attention to their food quality and habits. They pay less attention to a well-planned and organisation of items in their environment.

Trait 10: *Tamasic* habit

General meaning

This trait indicates the presence of sluggish and irresponsible behaviour. While performing activities the person feels lazy and lethargic, and stays inactive for most of their time. Any responsibility or decision making is avoided.

Interpretation

People with high scores have the tendency to procrastinate, stay lazy and sluggish, avoid responsibilities, and given a task be irresponsible. People with low scores have less sluggish and lazy in behaviour, and do not turn their backs on taking responsibilities or making any decision.

Trait 11: Passion

General meaning

Passion indicates a tendency to make new plans to seek different experiences. This trait implies a wish to run ahead of time.

Interpretation

People with high scores on this trait are enthusiastic and excited for making new plans, one after another. For them, chasing their dreams has a high importance. They try to get their work done very quickly and keep themselves busy. People with low scores on this trait are experiencing less excitement and enthusiasm. They are restful and follow a usual routine.

5.2. Personality profiles

For preparing personality profiles, mean values were calculated for all 11 traits of the five professions (engineers, medical professionals, teaching professionals, administrative professionals and students pursuing higher education). Each professional profile contains two columns, the column in orange colour represents the

profile of the professional group and the column in blue colour represents the general population group. A comparison of these columns in graph provides the differences and overlaps of traits between the general population and a profession.

Each trait is described as low, moderate or high in all personality profiles using stanine scores as mentioned in Appendix F on page 221.

In the following sections 5.3 and 5.4 includes an Analysis of variance (ANOVA) and Tukey's Post-hoc Analyses to see the effects of the traits across the professional groups and gender.

5.2.1. Profile of general population group

From the data of general population, mean of all 11 traits was calculated. The following abbreviates are used for 11 traits further in the chapter, i.e. *Sattvic* Knowledge (SK), *Rajasic* Habit (RH), *Sattvic* Spirituality (SS), Tranquillity (Tr), *Tamasic* Knowledge (TK), Maturity (Ma), Emotional Stability (ES), Empathy (Em), *Sattvic* Habit (SH), *Tamasic* Habit (TH) and Passion (Pa). The mean values of each trait are converted into stanine scores using Table 4.2. Given below Table 5.1 represents the means values and stanine scores of general population.

Table 5.1

Descriptive statistics of 11-traits for the general population

Traits	TK	SK	RH	SS	Tr	Ma	ES	Em	SH	TH	Pa
Mean	10.73	15.80	13.34	13.98	10.88	5.95	6.31	7.98	5.94	3.91	5.97
Stanine	5	4	5	5	4	5	4	4	4	5	5

From the stanine scores on different traits, a bar graph is prepared (see Figure 5.1) for graphical representation of the personality profile. In the Figure 5.1, the horizontal (x) axis is labelled “Traits” and the traits are indicated with abbreviates as mentioned above. The vertical (y) axis is labelled “Stanine”.

Figure 5.1. Personality profile for general population

Table 4.3 on Appendix F on page 222 is used to interpret the graph in Figure 5.1. It indicates that in the general population, the majority of members have moderate scores on all 11 traits. Theoretically, in a stanine distribution, for any trait, most people i.e. 68 % are expected to score in the moderate range, about 16 % score at the low end and another 16 % score at the high end. Moderate scores indicate that the personality of the general population doesn't lean too heavily on either the high or low direction. They can force themselves or choose to lean towards either direction to adjust with the environment if necessary.

Moderate *Tamasic* knowledge indicates leaning towards a high or low tendency of enduring unhygienic habits, pessimism and superstition in accordance to the environment.

Moderate *Sattvic* Knowledge indicates sometimes maturely understanding and believing in the presence of ‘supreme power’, letting it guide the behaviour and thought processes to do righteous deeds, but other times do not manage or choose such behaviour.

Moderate *Rajasic* Habit indicates occasionally worshiping Gods and demi-gods and performing severe rituals to fulfil personal wishes and get easy money. It also includes now and then manipulating moral ideas and standards of living for personal benefits.

Moderate ‘*Sattvic* Spirituality’ indicates intending to spiritually nurture one’s thinking and lifestyle sometimes by reading spiritual scriptures and books to gain spirituality and attend spiritual discourse by scholars.

Moderate ‘Tranquillity’ refers to sometimes being able to control one’s temper and maintain calmness in complicated situations.

Moderate ‘Maturity’ addresses the time-to-time ability to be modest, down-to-earth, not driven by materialistic desires and to feel attached to the actions and their results.

Moderate ‘Emotional Stability’ concerns the occasional management and balancing of emotions. It involves experiencing the state of equanimity and the detachment to everything and everyone from time to time.

Moderate 'Empathy' indicates sometimes feeling sensitive and compassion towards living and non-living beings, and having an empathetic and sensitive attitude towards people without having any personal connection to them.

Moderate '*Sattvic* habit' describes occasionally consuming food of good quality to nourish the body and sometimes following a disciplined lifestyle.

Moderate '*Tamasic* habit' indicates occasionally being sluggish, irresponsible and avoiding decision making.

Moderate 'Passion' indicates a tendency to sometimes try to run ahead of time and make new plans to seek different experiences, but not always.

5.2.3. Profile of Students

Table 5.2 shows mean values and stanine scores for the data of students pursuing higher education and the general population for the 11 traits.

Table 5.2

Mean value of 11-traits for students and the general population

Traits	TK	SK	RH	SS	Tr	Ma	ES	Em	SH	TH	Pa
Students	12.39	17.00	13.44	14.38	11.25	6.12	6.49	8.28	5.95	3.81	5.97
Stanine	5	6	4	4	4	5	3	4	3	5	5
Gen pop	10.73	15.80	13.34	13.98	10.88	5.95	6.31	7.98	5.94	3.91	5.97
Stanine	5	4	5	5	4	5	4	4	4	5	5

The stanine values from above table are used to prepare a personality profile of students and the general population in Figure 5.2.

Figure 5.2. Personality profile of students with 11 traits

The stanine scores for the student group are interpreted using Table 4.5 on appendix F on page 224. Compared to the general population, students are low scores on emotional stability only. Additional analysis using independent group t-test ($p < .05$) was conducted to compare the mean scores for students with the mean scores of the general on emotional stability. To compare the difference between the students and general population, the students group was excluded from the general population.

Table 5.3.

Compared means for students and general population

M1	M2	t	Significant
6.49	7.89	-10.58	0.000

An independent group t-test in Table 5.3 shows a significant difference in emotional stability between students and general population.

This profile shows that the students are emotionally unstable, experience frequent mood fluctuations and have more emotional problems than others. They feel controlled by situations instead of having control over situations and have difficulty in dealing with any negative or positive emotional situation quickly. On the other hand, Scott, Borges, and Early (2007) found that male and female medical students in The United States of America were more adaptive or emotionally stable than the general population. The disagreement over the findings might be due to cultural differences. Except for the trait 'emotional stability', students and the general population range moderately in all the ten traits.

Given below are the personality profiles for the teaching professionals, administrative professionals, engineers and the medical professionals. The mean values of all 11 traits for each profile are converted into stanine. In each profile, moderate mean scores for the general population and the professions reflect similarity in the profiles and no significant differences in the 11 traits.

Table 5.4 shows mean values and stanine scores of teaching professionals and the general population for the 11 traits.

Table 5.4

Mean value of 11-traits for teaching professionals and the general population

Traits	TK	SK	RH	SS	Tr	Ma	ES	Em	SH	TH	Pa
Teaching	10.95	14.91	12.36	13.65	10.92	6.27	6.38	7.93	5.63	3.87	5.93
Stanine	3	6	3	6	7	4	4	4	3	5	4

Gen popl	10.73	15.80	13.34	13.98	10.88	5.95	6.31	7.98	5.94	3.91	5.97
Stanine	5	4	5	5	4	5	4	4	4	5	5

The stanine scores from above table are used to prepare a personality profile of students and the general population in Figure 5.3.

Figure 5.3. Personality profile of teaching professionals with 11 traits

Table 5.5 shows mean values and stanine scores of medical professionals and the general population for the 11 traits.

Table 5.5

Mean value of 11-traits for medical professionals and the general population

Traits	TK	SK	RH	SS	Tr	Ma	ES	Em	SH	TH	Pa
Medical	11.43	16.58	13.91	14.20	11.07	5.66	6.45	8.17	6.18	3.88	5.91
Stanine	4	5	4	4	4	5	4	4	4	3	5

Gen popl											
	10.73	15.80	13.34	13.98	10.88	5.95	6.31	7.98	5.94	3.91	5.97
Stanine	5	4	5	5	4	5	4	4	4	5	5

The stanine scores from above table are used to prepare a personality profile of medical professionals and the general population in Figure 5.4.

Figure 5.4. Personality profile of medical professionals with 11 traits

Table 5.6 shows mean values and stanine scores of administrative professionals and the general population for the 11 traits.

Table 5.6

Mean value of 11-traits for administrative professionals and the general population

Traits	TK	SK	RH	SS	Tr	Ma	ES	Em	SH	TH	Pa
Administrative	10.10	15.68	13.56	14.08	10.94	5.79	6.27	8.01	5.90	3.88	6.03

Stanine	5	4	5	4	3	5	4	4	6	5	4
Gen popul	10.73	15.80	13.34	13.98	10.88	5.95	6.31	7.98	5.94	3.91	5.97
Stanine	5	4	5	5	4	5	4	4	4	5	5

The stanine scores from above table are used to prepare a personality profile of administrative professionals and the general population in Figure 5.5.

Figure 5.5. Personality profile of Administrative professionals with 11 traits

Table 5.7 shows mean values and stanine scores of engineers and the general population for the 11 traits.

Table 5.7

Mean value of 11-traits for engineers and the general population

Traits	TK	SK	RH	SS	Tr	Ma	ES	Em	SH	TH	Pa
Engineers	9.68	14.93	13.67	13.88	10.11	5.51	6.30	7.28	6.11	4.07	6.07

Stanine	5	4	5	5	4	5	4	4	4	4	5
Gen popl.	10.73	15.80	13.34	13.98	10.88	5.95	6.31	7.98	5.94	3.91	5.97
Stanine	5	4	5	5	4	5	4	4	4	5	5

The stanine scores from above table are used to prepare a personality profile of engineers and the general population in Figure 5.6.

Figure 5.6. Personality profile of engineers with 11 traits

The figures mentioned above shows an overlap of profiles of the general population and professions groups. This indicates that no differences exists in personality traits of professionals and the general population, except for the students group in emotional stability.

Conclusion:

Personality differences exist between students and the general population on 1 of 11 traits. Based on the student normative sample generated in the present study, students in higher education program appears to have low emotional stability as compared to the general population. The personality profiles of the teaching professionals, administrative professionals, engineers and medical professional had all the traits overlap with that of general population. Further to measure the effects of 11 traits between the professional groups, an analysis of variance (ANOVA) and post hoc analysis were used.

5.3. Analysis of Variance and Post-hoc analysis: Professional groups

The sorted data was subjected to Analysis of Variance (ANOVA) to find significant differences between the professional groups. The results of the ANOVA found significant effects of 4 out of 11 traits across the eight professions. These four traits are *Tamasic* Knowledge, *Sattvic* Knowledge, Tranquillity and Empathy. Although the results of the ANOVA indicate a significant effect, it is important to know between which groups the effect exists. To determine this, further analyses was conducted with Post-hoc test, Tukey's HSD was conducted to compare one group (e.g. engineers) to another other group (e.g. teaching professionals, medical personnel etc.).

This section includes the results of ANOVA and Post Hoc analyses of the four traits, i.e. *sattvik* knowledge, *tamasic* knowledge, tranquillity and empathy, for the eight professional groups. The rest of the seven traits had no significant results in the ANOVA and post-hoc, hence their results are not discussed here.

5.3.1. *Tamasic* knowledge

A one-way ANOVA was conducted to find significant differences in the scores of *Tamasic* knowledge between the eight professional groups. Table 5.8 shows the results of one-way ANOVA.

Table 5.8

Tamasic Knowledge: Analysis of variance

	df	Mean Square	F	Sig.
Between Groups	7	169.263	17.729	.000
Within Groups	1010	9.547		
Total	1017			

Table 5.8 shows the significant differences between the professional groups in *Tamasic* knowledge at the $p = .000$, $F(7, 1010) = 17.729$. However, it is important to know between which groups this effect exists. Hence, Tukey's HSD was conducted.

Table 5.9

Post hoc result: Tamasic knowledge

		Multiple Comparisons			
Dependent Variable				Mean Difference(I- J)	Sig.
		(I)Category	(J)Category		
<i>Tamasic_</i> knowledge	Tukey HSD	Students	Teaching professionals	1.444 [*]	.000
			Administration	2.291 [*]	.000
			Engineer	2.706 [*]	.000
			Lawyer	2.868 [*]	.000
			Self-Employed	3.317 [*]	.000
			Home-makers	2.661 [*]	.003
		Engineer	Medical	-1.743 [*]	.001
		Medical	Lawyer	1.905 [*]	.000
			Self-Employed	2.354 [*]	.001
Note- *. The mean difference is significant at the 0.05 level.					

Table 5.8 shows the result of Post hoc comparison using the Tukey's HSD test. The table values indicate that the mean score for students ($M = 12.39$) significantly differ from teaching professionals ($M = 10.95$), administrative workers ($M = 10.10$), engineers ($M = 9.68$), lawyers ($M = 9.52$), self-employed ($M = 9.07$) and home-makers ($M = 9.73$). However, mean score of students ($M = 12.39$) did not

significant difference from the medical professionals ($M = 11.43$). The mean score for the engineers group ($M = 9.68$) significantly differ from medical professionals ($M = 11.43$). The medical professionals ($M = 11.43$) was significantly different from lawyers ($M = 9.52$) and self-employed ($M = 9.07$). The mean scores are used to prepare figure 5.7.

Figure 5.7. Effect of *Tamasic* knowledge across the professions groups

Taken together, these results suggests that students have higher scores in *Tamasic* knowledge than teaching professionals, administrative professionals, engineers, lawyers, self-employed people and home-makers. The medical professionals have higher scores in *Tamasic* knowledge than the engineers, lawyers and self-employed people.

When *tamasic* knowledge dominates an individual's personality, he/she is inclined to have a pessimistic outlook on life situations, believes in superstitions to solve problems and indulge in unhygienic practices. Students think a lot and worry

about their future perspectives more than other professional groups because the latter is more stable than former in their respective disciplines. Students have concerns about the economic conditions of their families and wish to contribute to maintain or uplift this condition. These worries and thoughts make them vulnerable to pessimistic attitude and lead to increase in *tamasic* knowledge. Similarly, medical professionals score significantly higher than lawyers and people who are self-employed on *tamasic* knowledge. This might be because the field of medicine demands the quality number of years in medical schools, is highly expensive and more commercial than the field of law and self-employment. This environment makes them vulnerable to pessimistic outlook, believe in superstitions to solve problems and indulge in unhygienic practices for self.

5.3.2. *Sattvic* knowledge

A one-way ANOVA was conducted to compare the effect of *Sattvic* knowledge on the eight professional groups. Table 5.9 shows the results of one-way ANOVA.

Table 5.10

Sattvic knowledge: Analysis of variance

	df	Mean Square	F	Sig.
Between Groups	7	99.896	4.659	.000
Within Groups	1010	21.443		
Total	1017			

Table 5.10 indicates a significant difference in the scores of *Sattvic* knowledge for the professionals groups at the $p < .05$ level, $F(7, 1010) = 4.659$, $p = .000$. To know between which groups this effect exists, Tukey's HSD was conducted. Table 5.11 shows the results of Tukey's HSD.

Table 5.11

Post hoc result: Sattvic knowledge

Multiple Comparisons					
Dependent Variable		(I)Category	(J)Category	Mean Difference (I-J)	Sig.
<i>Sattvic_</i> knowledge	Tuckey HSD	Students	Teaching	2.085*	.000
			professionals		
			Engineer	2.065*	.004
Note- *The mean difference is significant at the 0.05 level.					

In Table 5.11, Tukey's HSD indicated that the mean score of the students ($M = 17.00$) in *Sattvic* Knowledge is significantly higher than the teaching professionals ($M = 14.91$) and engineers ($M = 14.93$).

Figure 5.8. Effect of *Sattvic* knowledge across professional groups

When put together, the results of one-way ANOVA indicates significant effect of *Sattvic* Knowledge on eight professional groups. Post hoc analysis using the Tukey's HSD test indicates that students have significantly high scores on *Sattvic* Knowledge than teaching professionals and engineers. The influence of *Sattvic* knowledge determines the ability to understand and believe in supreme power. *Sattvic* knowledge has a significant effect on only students, teaching professionals and engineers among all the professional groups.

5.3.3. Tranquillity

Table 5.12 shows the results of one-way ANOVA, conducted to measure the effect of Tranquillity on professional groups.

Table 5.12

Tranquillity: Analysis of variance

	df	Mean Square	F	Sig.
Between Groups	7	32.066	5.073	.000
Within Groups	1010	6.321		
Total	1017			

The results in Table 5.12 indicate a significant effect of Tranquillity on the professionals groups at the $p < .05$ level, $F(7, 1010) = 5.073$. Further, Table 5.13 shows the effect between the groups.

Table 5.13

Post hoc result: Tranquillity

Multiple Comparisons					
Dependent					
Variable		(I)Category	(J)Category	Mean Difference (I-J)	Sig.
Tranquillity	Tukey	Students	Engineer	1.137 [*]	.003
	HSD		Home-makers	2.703 [*]	.000
		Teaching professionals	Home-makers	2.375 [*]	.001
		Administration	Home-makers	2.396 [*]	.001
		Medical	Home-makers	2.524 [*]	.001
		Lawyer	Home-makers	2.246 [*]	.004
		Self-Employed	Home-makers	2.669 [*]	.002
*. The mean difference is significant at the 0.05 level.					

In Table 5.13, Tukey's HSD indicates that the mean score of home-makers ($M = 8.55$) in Tranquillity is significantly higher than teaching professionals ($M = 10.92$), administrative professionals ($M = 10.94$), medical ($M = 11.07$), lawyer ($M = 10.79$)

and self-employed ($M = 11.21$), $p < 0.05$. The mean score of engineers ($M = 10.11$) does not differ significantly from home-makers. The mean score for students ($M = 11.25$) is significantly higher than engineers ($M = 10.11$) and home-makers ($M = 8.55$). The mean scores are used for graphical representation in Figure 5.9.

Figure 5.9. Effect of Tranquillity across professional groups

When put together, the results of one-way ANOVA indicates significant effect of Tranquillity on eight professional groups. Post hoc analysis using the Tukey's HSD test indicates that the home-makers have significantly low tranquillity than teaching professionals, administrative professionals, medical professionals, lawyers, self-employed people, students and engineers at the $p < 0.05$. The students have significantly higher tranquillity than home-makers and engineers. The influence of Tranquillity determines the capacity to control one's temper and maintain calmness. It has a significant effect on all the professional groups.

5.3.4. Empathy

Table 5.14 shows the results of the one way ANOVA used to measure the effect of Empathy on the eight professional groups.

Table 5.14

Empathy: Analysis of variance

	df	Mean Square	F	Sig.
Between Groups	7	11.988	3.769	.000
Within Groups	1010	3.181		
Total	1017			

Table 5.14 indicates a significant effect of Empathy on all professionals groups at the $p < .05$ level, $F(7, 1010) = 3.769$, $p = .000$. Tukey's HSD test measured the significant effects of empathy between these professional groups (see table 5.15).

Table 5.15

Post hoc result: Empathy

Multiple Comparisons					
Dependent Variable					
		(I)Category	(J)Category	Mean Difference (I-J)	Sig.
Empathy	TukeyHSD	Students	Engineer	.999*	.000
*. The mean difference is significant at the 0.05 level.					

Table 5.15 indicates that the mean score of the students ($M = 8.28$) is significantly higher than engineers ($M = 7.28$) at $p < 0.05$.

Figure 5.10. Effect of Empathy across professional groups

When put together, the results of one-way ANOVA indicate significant effect of Empathy on all eight professional groups. Post hoc analysis using the Tukey's HSD test indicates that the students have higher empathy than the engineers at the $p < .05$. Empathy has a significant effect on only students and engineers among all the professional groups. It is about being compassionate towards people without having any personal connection with them and even with the deprived. The current finding suggests that students are higher in empathy than the engineers. Chen, Kirshenbaum, Yan, Aseltine (2012) and Hojat (2016) suggested that people in technology-oriented specialities (especially engineering) have lower empathy scores than people-oriented specialities. Roeser (2012) suggested that training in empathy would be helpful for engineers because they are low on it. The studies mentioned above are agreeable with present finding that engineers have less empathy.

5.4. Gender difference in trait profile

This section includes SRT-trait personality profiles based on gender. As an objective of the study, Trait-based personality profiles according to gender are prepared. The gender profiling is to help individuals and professionals draw an interpretation of personality profiles with a reference group. The mean values of 11 traits for the male and female group are converted to stanine scores. These stanine scores are represented in graphical form in figures given below.

Table 5.16 shows mean values and stanine scores of females and the general population for the 11 traits.

Table 5.16

Mean value of 11-traits for females and the general population

Traits	TK	SK	RH	SS	Tr	Ma	ES	Em	SH	TH	Pa
Females	11.08	15.91	13.26	14.06	10.95	5.99	6.38	8.10	5.86	3.94	5.92
Stanine	4	5	4	4	4	5	4	4	4	4	5
Gen. popl	10.73	15.80	13.34	13.98	10.88	5.95	6.31	7.98	5.94	3.91	5.97
Stanine	5	4	5	5	4	5	4	4	4	5	5

The stanine scores from above table are used to prepare a personality profile of females and the general population in Figure 5.11.

Figure 5.11. Personality profile of female group

The interpretation of figure 5.11 indicates that the general population and females lie in moderate range for all the 11 traits.

Table 5.17 shows mean values and stanine scores of males and the general population for the 11 traits.

Table 5.17

Mean value of 11-traits for males and the general population

Traits	TK	SK	RH	SS	Tr	Ma	ES	Em	SH	TH	Pa
Males	10.43	15.70	13.40	13.91	10.81	5.91	6.25	7.88	6.01	3.88	6.01
Stanine	5	4	4	4	4	5	4	3	4	5	5
Gen. popl	10.73	15.80	13.34	13.98	10.88	5.95	6.31	7.98	5.94	3.91	5.97
Stanine	5	4	5	5	4	5	4	4	4	5	5

The stanine scores from above table are used to prepare a personality profile of males and the general population in Figure 5.12.

Figure 5.12. Personality profile of male group

The interpretation of stanine scores indicate that general population and males lie in moderate range for all the 11 traits.

The figures 5.11 and 5.12 show that the profiles from the general population overlap with both the gender. This overlap of the plots reflects a similarity in the profiles of the gender and the general population.

Further analyses includes the analyses of variance (ANOVA) and post-hoc analysis to calculate the effect of the 11 traits across the gender groups.

5.5. Analysis of Variance and Post-hoc analysis: Gender groups

The data sorted into the male and female group was subjected to the analysis of variance (ANOVA) to find significant differences between the gender groups by traits. The results of the ANOVA found a significant effect of only one trait, i.e. *tamasic* knowledge out of 11 traits across the two gender groups.

The results of the ANOVA for *tamasic* knowledge is mentioned below because the rest of the ten traits did not have any significant effect on the male and female groups.

5.5.1. *Tamasic* knowledge

A one-way ANOVA was conducted to measure the effect of *tamasic* knowledge on both the gender groups.

Table 5.18

ANOVA: Tamasic knowledge

	df	Mean Sq.	F	Sig.
Female	1	107.327	10.172	.001
Male	1016	10.551		

Table 5.18 shows that *tamasic* knowledge had a significant effect on both the gender groups at the $p < .05$ level, $F(1, 1016) = 10.172$, $p = .001$. The mean score of the Female group ($M = 11.07$) is significantly higher than the mean of the Male group ($M = 10.42$) at $p < 0.05$.

Figure 5.13. Effect of *tamasic* knowledge on gender

The female group scored higher than the male group, $F(1, 1016) = 10.172$, $p = 0.001$, which implies that females have higher *tamasic* knowledge than males.

Tamasic knowledge is one of the traits of *tamas gunas* that brings in a pessimistic outlook on life situations, believe in superstitious practices to solve problems and indulgence in unhygienic practices. On similar lines, Scott, Borges, and Early (2007) found that female medical students were more self-doubting, worried and tensed than male medical students. A pessimistic outlook on life situations brings self-doubts, tensions and worries and because of a high *Tamasic* knowledge, females have pessimistic viewpoint. On the other hand, Jain and Sharma (2008) found that males have higher scores on *tamas guna* than females. This finding is incongruous to current finding.

5.6. Conclusion of the current study

In the beginning, the present study provided details about different theories, various approaches and determinants of personality in both Western and Indian psychology. In Western psychology, the lexical method has proved efficient for the classification of personality to derive traits and for the formulation of trait approach. Various models and empirical studies are based on the trait approach. The use of the lexical approach and text clustering led to the development of the theoretical framework of the SRT-Trait model of personality in Indian psychology. This model has 19 traits of which seven traits are postulated from *sattva guna* (Altruism, Non-Violence, *Sattvic* Habits, Empathy, Maturity, *Sattvic* Knowledge and Composed), five from *rajas guna* (Passion, Boastful, Opportunist, Emotional Fluctuation and *Rajasic* knowledge) and six from *tamas guna* (Pessimism, *Tamasic* Habits, Lethargy, Immorality, *Tamasic* Knowledge and Procrastination). The operational definition of each trait was used to prepare 155 statements in colloquial speech for the empirical test of this model. These statements formed the items of the SRT-Trait scale. Data collected from general population was subjected to oblique factor analysis. The intention of the oblique factor analysis was to find a latent factor structure similar to the theoretical framework. However, the empirical model and the theoretical model had certain differences. Not only the number of items and traits were reduced because they were misfit, also a few factors emerged that had items pooled from two different traits which were not in accordance with the theoretical model. The data suggested the following combinations- the items of *tamasic* habit, pessimism and *tamasic* knowledge combined to constitute one factor, i.e. *tamasic* Knowledge. Items of *sattvic* knowledge split and some of them merged with items of maturity to form the factor *sattvic* Knowledge. Items of *rajasic* knowledge, *tamasic* knowledge and

immorality formed *rajasic* Habit. The remaining items from *sattvic* knowledge (laying special emphasis on spirituality) formed a new factor named *sattvic* spirituality. The items of tranquillity and content split into two factors. Some of them combined with items of *sattvic* habit and non-violence to form the factor named tranquillity. The others combined with one reverse scored item of emotional fluctuation. The factor was renamed as Emotional Stability. Items of trait maturity were not combined with any other item, so trait remained original. Items of altruism and empathy combined to form Empathy. Like before, items of *tamasic* habit split into two factors. One item of *tamasic* habit combined (as a reverse scored item) with items of *sattvic* habit to form *Sattvic* habit. Other items of *tamasic* habit combined with items of lethargy and procrastination to form *Tamasic* habit. Lastly, items of passion and ambition combined to form the trait Passion.

After removing the misfit items, the final scale had 35 items and the number of traits reduced from 19 to 11. Table 3.8 in Appendix E on page 215 has the list of 35 items. The empirical model shows following 11 traits- *tamasic* knowledge, *sattvic* knowledge, *rajasic* habit, *sattvic* spirituality, tranquillity, maturity, emotional stability, empathy, *sattvic* habit, *tamasic* habit and passion. Another set of data was collected from 1018 participants on the 35 items scale to check the fitness of the Empirical SRT-trait model with 11 traits. The same sample was used to standardize the SRT trait scale. The model fit indices indicated that the empirical SRT-trait model as good and acceptable. For standardization, stanine norms for the general population were developed with the dataset of 1018 participants. Then, the data were sorted into eight subgroups of professions and two subgroups of gender. Stanine norms were developed for both the gender groups and five out of eight professional groups, because three groups had insufficient data. Based on the mean values of the 11 traits

for the overall group and subgroups, personality profiles were prepared. The stanine scores were used for the interpretation of these profiles.

To measure the effect of the 11 trait among the eight professional groups and between the two gender groups, ANOVA and Post-hoc analyses were performed. The results showed that four traits that is, *tamasic* knowledge, *sattvic* knowledge, tranquillity and empathy had significant effects across the eight professional groups, whereas only *tamasic* knowledge had significant effect across the gender.

5.7. Implications of the current study

Psychologists over the years have defined human personality using many models and theories. The *Guna* theory of tri-dimensional classification of human personality emanates from Indian psychology (Khanna, Singh & Verma, 2013). The manifestation of the *Gunas* and their influence on the human mind and behaviour has interested psychologists and researchers across the world.

While Indian Psychology is indigenous in origin, its appeal is universal. It has been said that Indian Psychology is a "complex subject variously viewed as esoteric and spiritual, philosophical and speculative, practical and ritualistic, and of course, systematic and scientific understanding of human nature."

The Indian perspective of personality deals with the tri-dimensional classification of *Gunas* (*Sattva*, *Rajas*, and *Tamas*) entailing physical, mental, and spiritual elements of personality (Khanna, Singh & Verma, 2013). The present study introduces a new perspective in Indian Psychology that defines personality as Trait Construct.

In Indian perspective, personality is referred through both the biological and psychological system. The psychological system dealing with the *Triguna* was the

focus of the present study. This system incorporates the physical, mental, and spiritual aspects of personality. The inherent richness of the triadic language of the *Gunas* offers a wider scope to understand human nature as contrasted with the bipolar descriptions of Western psychology (Khanna, Singh & Verma, 2013). With its focus on the innate qualities of the three *Gunas* whose varying balance embodies personality, the Indian perspective offers a deeper, holistic, and spiritual understanding of human nature.

The present study was a step ahead towards integrating the holistic Indian approach of personality with widely used Western concepts. However, this study dealt with the ongoing syntheses of diverse sources and its validation with other constructs. Future researchers shall look for opportunities to relate these traits with other psychological constructs like extending it as a screening tool to choose a career or to consider the potentials of applicants during an interview or a selection process. The methodology used in this multi-component trait analyses can be used in future to establish personality description for other theories in Indian Psychology like the *tridosha*, etc.

Future researchers can involve more diverse and representative samples to attain conclusive evidence about the relation between traits with other psychological constructs like extending it as a screening tool to choose a career or to consider the potentials of applicants during the interview and selection process and its trends across different segments of the population. Future work in the area can look at a holistic picture integrating different indigenous components, including Ayurveda, Yoga, etc., and their impact on body-mind processes.

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