UNIT 2   RAYMOND CATTELL: A TRAIT THEORY OF PERSONALITY

Structure

2.0   INTRODUCTION

Cattell's theory seeks to explain the complicated transactions between the personality system and the more inclusive sociocultural matrix of the functioning organism. He suggested that an adequate theory of personality must take into account the multiple traits that comprise the personality, the extent to which these traits are genetically and environmentally determined, and the ways in which genetic and environmental factors interact to influence behaviour. He is also of the opinion that an appropriate theory of personality must take into account the multiple traits that comprise the personality, the extent to which these traits are genetically and environmentally determined, and the ways in which genetic and environmental factors interact to influence behaviour. In this unit we will be studying the details regarding Cattell's Trait theory of personality, its definitions, the dynamics underlying the theory etc.

2.1   OBJECTIVES

After completion of this unit, you will be able to:

* Define Cattell's theory of personality;

* Describe the characteristic features related to trait theory;

* Explain the various methods and measurement instruments of trait;

* List out the categories of traits; and

* Explain the functions of traits and their influence on personality.

2.2 CATTELL'S TRAIT THEORY OF PERSONALITY

Raymond Cattell was born in 1905 and died in 1998. He was educated in Britain and he obtained his doctorate from University of London and after which he worked as director, child guidance clinic for 5 years. He came to the US to work with E.L.Thorndike and developed officer selection methods. He established an Institute for Personality and Ability testing. He taught at University of Illinois for 30 years and more and went to Hawai in 1978 and until death he was teaching in the University of Hawaii.

Cattell thought that clinicians observations were not a scientific basis for understanding or classifying personality. He used inductive method of scientific inquiry to develop his theory of personality. That is, he gathered large amount of data and used factor analysis on the data looking for clusters.

For Cattell personality was that which permitted a prediction of what a person will do in a given situation. The underlying basic factors of a person's personalities was termed by him as source traits. He used factor analysis and found common clusters of surface traits. These clusters were termed by Cattell as Source traits. He gathered data about the individual from the liferecord etc., took self reports and used the Questionnaire data and used tests and obtained test results which all put together with source traits gave the personality of an individual.

Cattell has identified 35 primary traits of which 23 characterised normal individuals and 12 characterised abnormal individuals. He developed a scale called 16 PF which was designed to assess 16 different source traits associated with normal behaviour.

Cattell said that humans are innately driven by ergs, which means goals were created because of hunger, curiosity, anger, fear, or other basic motivations which are found in both humans and primates.

Cattell distinguished two types of intelligence viz., (i) Fluid intelligence (ii) Crystallised intelligence. According to him, Fluid intelligence allows the persons to learn new things regardless of past experience, whereas the crystallized intelligence is the ability to solve problems based upon previous experience. Cattell believed that intelligence was primarily an inherited trait.

Cattell was of the view that personality has to be considered in terms of not only traits but also various other variables including attitudes. Cattell defined attitude as the desire to act in a specific way in response to a specific situation. Attitudes are interconnected within the Dynamic lattice, that is dynamic lattice is Cattell's attempt to display graphically his theoretical analysis of the relationship between the mind's instinctive driving forces and their overlying semantic and attitudinal superstructure. The specific attitudinal connections within the dynamic lattice are controlled by susidiation chains, that is some attitudes are subordinate to other attitudes. The subsidisation chain helps determine when specific attitude will produce a specific behaviour.

Environmental factors were considered essential by Cattell to determine personality and behaviour.

Ergs are goals created because of hunger, thirst etc. The organism is motivated to get food when hungry. These are called ergs.

Socially created goals are called socially shaped ergs and Cattell gave it the term socially shaped ergic manifolds. In short form it was called SEM. Cattell used SEM to help explain the contribution of the environment to human behaviour.

SEM's are socially acquired and can satisfy several ergs at one time. Because SEMS are socially acquired, they vary in number and type by culture.

SEM's get their energy from the ERG's.

Humans are innately driven by *ergs*, which are goals created by curiosity, anger, hunger, fear, and many other basic motivations.

Through research Cattell developed list of ergs which are for instance, Food-Seeking, Mating, Gregariousness, Parental Protectiveness, Exploration, Safety, Self-Assertion, Pugnacity, Narcissistic Sex, and Acquisitiveness.

Some of the major socially shaped ergic models are profession, family and home, spouse, religion. Together with attitudes, ERHGs and SEMs interact to produce behaviour.

According to Cattell, if you can systematically identify their attitudes, ERG's and SEM's, you should then be able to reliably predict future behaviour.

Cattell's trait theory of personality attempts to explain the interaction between the genetic and personality systems and the socio cultural milieu within which the organism is functioning. It delves deep into the complicated transactions between the personality system and the more inclusive sociocultural matrix of the functioning organism. According to him these traits are genetically and environmentally determined, and the ways in which genetic and environmental factors interact decide the behaviour of the individual. Cattell opines that an appropriate theory of personality must take into account the multiple traits that comprise the personality. The theory should be able to indicate the ways in which genetic and environmental factors interact to influence behaviour. He believes that an appropriate theory of personality functioning and growth must be based on systematic research methods and precise measurements. Multivariate statistics and factor analysis are his preferred methods of personality study.

Self Assessment Questions

1) Describe in detail Cattell's trait theory of personality.

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2) What are the two types of Intelligence as put forward by Cattell?

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3) Define and describe ERGs and SEMs

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4) How does Cattell use ERGs and SEMs in his theory of Personality?

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2.2.1 The Formula for Personality

According to Cattell [1965], personality is that which permits us to predict what a person will do in a given situation. With the help of mathematical analysis of personality, he suggests that the prediction of behaviour can be made by a *specification equation* .The formula used by Cattell to predict behaviour with any degree of accuracy is given below:

$$R = f (S, P)$$

Where R refers to the nature of a person's specific response, f refers to the unspecified function, S refers to the stimulus situation at a given moment in time and P refers to the Personality structure.

To be more specific, this formula signifies that the nature of a person' specific response(R), meaning what the person does or thinks or verbalises, is some unspecified function(f) of the stimulus situation(S) at a given moment in time and also of the individual's personality structure(P).

The specification equation shows that the person's specific response to any given situation is a function of all the combined traits relevant to that situation. Here each trait is interacting with situational factors that may affect it.

Cattell also accepts that it is difficult to predict a person's behaviour in a given situation. In order to increase predictive accuracy, the personality theorist must

consider not only what traits a person possesses but also the many nontrait variables such as for example, the person's moods and particular social roles called for in the situation and related aspects.

It is also necessary to weigh each trait according to its relevance to the situation in question. For example, if the person were in emotionally arousing situation, the trait of anxiety would be assigned a high weight in predicting the person's response. Thus, the equation is an oversimplification of Cattell's trait theory, yet, this general formula conveys Cattell's strong belief that human behaviour is determined and can be predicted.

2.3 CATEGORIES OF TRAITS

According to Cattell, behaviour is determined by the interaction of traits and situational variables, but his major organising concept of personality resides in his descriptions of the various kinds of traits he has identified. Traits are relatively permanent and pervasive tendencies to respond with consistency from one situation to another and from one time to another. Traits are hypothetical mental structures inferred from behaviour which predispose the person to behave uniformly across various circumstances and across time. Traits reflect the person's stable and predictable characteristics and are by far the most important of Cattell's concepts.

Cattell (1965,1978) relies heavily on factor analysis to investigate the structural elements of personality. He concludes that traits can be classified in several ways (Cattell also uses the term *factors)* such as (i) surface traits (ii) source traits (iii) constitutional traits (iv) Environmental mold traits (v) ability trait (vi) temperament (vii) dynamic traits (viii) common traints (ix) Unique traits. Let us take up these traits and see how they function.

i) **Surface Traits versus Source Traits.** A *surface trait* is a set of behavioural characteristics that all seem to 'hang' together**.** For instance, the observed characteristics of inability to concentrate, indecisiveness, restlessness etc., may cluster together to form the surface trait of neuroticism. Here, the trait of neuroticism is observed by a cluster of overt elements that seem to go together. It does not derive from any single factor or element. Surface traits do not have a unitary basis and are not consistent overtime and hence, they are not given much value for behavioural accountability.

On the other hand, *source traits* are the basic, underlying structures which constitute the building blocks of personality. They represent the unitary dimension or factors that ultimately determine the consistencies in each person's observed behaviour. Source traits exist at a "deeper" level of the personality and are the causes of behaviour in diverse domains over an extended period of time.

After extensive factor analytic research, Cattell[1979] concluded that there are approximately 16 source traits that constitute the underlying structure of personality. These were put forward by him as (i) warmth (ii) Reasoning (iii) Emootional stability (iv) Dominance (v) Liveliness (vi) Rule Consciousness (vii) social boldness (viii) Sensitivity (ix) vigilance (x) Abstractness (xi) Privateness (xii) Apprehension (xiii) Openness to change (xiv) Self reliance (xv) Perfectionism (xvi) Tension.

16 PF (Sixteen Personality Factor Questionnaire), designed by Cattell consists of the above 16 personality trait factors. It is a self report scale that has proved to be quite useful and popular in both applied and research settings. Cattell considered personality traits to have multi level hierarchical structure. In his research Cattell tried to find out the primary traits of personality and found that these primary traits came together in meaningful groupings and formed broader global traits. These global traints were termed by him as secondary traits.

For example the first global trait he found was the introversion extraversion. It resulted from the natural affinity of five primary traits that defined different reasons for an individual to move toward people and away from prople. Cattell stated that that there was a natural tendency for these traits to go together in the real world, and thesed represented important social behav ioural domain. The primary traits that constituted the extraversion introversion dimension were :

- **Warmth (Factor A)**: the tendency to move toward others seeking closeness and connection because of genuine feelings of caring, sympathy, and concern (versus the tendency to be reserved and detached, and thus be independent and unemotional).

- **Liveliness (Factor F)**: the tendency to be high-energy, fun-loving, and carefree, and to spontaneously move towards others in an animated, stimulating manner. Low-scorers tend to be more serious and self-restrained, and to be cautious, unrushed, and judicious.

- **Social Boldness (Factor H)**: the tendency to seek social interaction in a confident, fearless manner, enjoying challenges, risks, and being the center of attention. Low-scorers tend to be shy and timid, and to be more modest and risk-avoidant.

- **Forthrightness (Factor N)**: the tendency to want to be known by others— to be open, forthright, and genuine in social situations, and thus to be self-revealing and unguarded. Low-scorers tend to be more private and unself-revealing, and to be harder to get to know.

- **Affiliative (Factor Q2)**: the tendency to seek companionship and enjoy belonging to and functioning in a group (inclusive, cooperative, good follower, willing to compromise). Low-scorers tend to be more individualistic and self-reliant and to value their autonomy.

In a similar manner, Cattell and his colleagues found that four other primary traits consistently merged to define another global factor called as Receptivity or Openness (versus Tough-Mindedness). This factor was made up of four primary traits that describe different kinds of openness to the world and these were identified as

- Openness to sensitive feelings, emotions, intuition, and aesthetic dimensions **(Sensitivity – Factor I)**

- Openness to abstract, theoretical ideas, conceptual thinking, and imagination **(Abstractedness – Factor M)**

- Openness to free thinking, inquiry, exploration of new approaches, and innovative solutions **(Openness-to-Change – Factor Q1)** and

- Openness to people and their feelings **(Warmth – Factor A)**.

Another global factor, **Self-Controlled (or conscientious) versus Unrestrained**, resulted from the four primary factors that came together. These were as given below:

- **Rule-Consciousness (Factor G)** involves adopting and conscientiously following society's accepted standards of behaviour

- **Perfectionism (Factor Q3)** describes a tendency to be self-disciplined, organised, thorough, attentive to detail, and goal-oriented

- **Seriousness (Factor F)** involves a tendency to be cautious, reflective, self-restrained, and deliberate in making decisions; and

- **Groundedness (Factor M)** involves a tendency to stay focused on concrete, pragmatic, realistic solutions.

Because the global factors were developed by factor-analysing the primary traits, the meanings of the global traits were determined by the primary traits which made them up. In addition, the global factors helped in understanding the meaning and function of each of the primary traits. Thus, the two levels of personality are essentially inter-connected and inter-related

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Self Assessment Questions

1) Define and elucideate $Rs = f(S,P)$.

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2) What are the different categories of traits?

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3) What is a source trait and a surface trait?

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4) Put forward the 16 personality factors. How did Cattell arrive at these traits?

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2.4 ROLE OF HERDITY AND ENVIRONMENT

Cattell has tried to determine the relative contributions of heredity and environment to the development of traits.

He devised a statistical technique for this purpose and called it *multiple abstract variance analysis(MAVA)*. This test estimates not only the presence or absence of genetic influence but also the degree to which traits are due to genetic or to environmental influences[Cattell,1960].

MAVA involves gathering data on the resemblances between identical twins raised in the same family, non-twin siblings raised in the same family, identical twins raised apart, and non-twins siblings raised apart.

Results from MAVA technique (based on personality tests administered to assess a particular trait) suggest that the importance of genetic and environmental influences varies widely from trait to trait.

For example, Cattell's data indicate that about 65 to 70 percent of the variation in scores on measures of intelligence and assertiveness can be accounted for by genetic factors, whereas the genetic influence on traits such as conscientiousness and neuroticism is half that. Cattell estimates that about two-thirds of personality is determined by environmental influences and one–third by heredity.

Along with immediate situational factors, Cattell believes that much of people's behaviour is determined by the groups to which they belong (such as families, peer groups, school, and the like). Just as people can be described in terms of their traits, so can traits be used to describe social groups with which people are associated.

The trait dimensions along which groups can be objectively described are called their *syntality*.

Using factor analysis Cattell[1949]studied the syntality of various religious, school, and peer groups. He also studied several traits that compose the syntality of entire nations (Cattell et al., 1952). The major traits found to identify the syntality of countries included size, morale, affluence, and industriousness.

2.5 CONSTITUTIONAL VERSUS ENVIRONMENTAL – MOLD TRAITS

Source traits can be divided into two subtypes-depending on their origin.

Constitutional traits derive from the biological and physiological conditions of the person. For instance, recovery from cocaine addiction may cause a person to be momentarily irritable, depressed, and anxious. Cattell would suggest that these behaviours result from changes in the person's physiology and thus reflect constitutional source traits.

Environmental-mold traits are determined by influences in the social and physical environment. These traits reflect learned characteristics and styles of behaving and form a pattern that is imprinted on the personality by the individual's environment. Thus, a person who is raised in a rural setting behaves differently from a person, who grows up in an urban area.

2.6 ABILITY, TEMPERAMENT AND DYNAMIC TRAITS

Source traits can further be classified in terms of the modality through which they are expressed.

Ability traits determine the person's skill and effectiveness in pursuing a desired goal. For example, intelligence, musical aptitude.

Temperament traits relate to other emotional and stylistic qualities of behaviour. For example, people may either work quickly or slowly on a task. Cattell considers temperament traits to constitutional source traits that determine a person's emotionality.

Dynamic traits reflect the motivational elements of human behaviour. These are traits that activate and direct the person toward particular goals. Thus, a person may be characterised as ambitious, power-oriented, or interested in acquiring material possessions.

2.7 COMMON VERSUS UNIQUE TRAITS

A *common trait* is one that is shared in varying degrees by all members of the same culture. For example, self-esteem, intelligence, and introversion.

Unique traits are those that are shared by few or no other people. Unique traits are especially observed in the areas of interests and attitudes.

Cattell gives much significance on the use of factor analysis to identify the major traits of personality. Cattell draws his data from three basic sources: life record data(L-data),self-rating questionnaire data(Q-data), and objective test data(OT-data).

L-data, involves the measurement of behaviour in actual, everyday situations such as school performance or interactions with peers.

Q-data, refers to the person's self-ratings about his/her behaviour, feelings or thoughts.

Such information reflects the person's introspections and self-observations (For example, Sixteen Personality Factor Questionnaire).

Such data is prone to faking.

Finally, *OT-data* are derived from the creation of special situations in which the person's performance on certain tasks may be objectively scored. For example, responding to a Rorschach test. Such data is resistant to faking.

Self Assessment Questions

1) Define Ability traits, temperament and dynamic traits .

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2) What do you understand by the terms common and unique traits?

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3) Define and describe L data, Q data and OT data. How are these
    contributing to personality?

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2.8   LET US SUM UP

Cattell's trait theory views personality as that which permits us to predict what a person will do in a given situation, as expressed in the equation R=f (S,P).

Traits are hypothetical constructs which predispose the person to behave consistently across circumstances and time.

He sees the essence of personality structure as consisting of approximately 16 source trait factors.

Source traits can be divided into constitutional or environmental-mold traits.

Ability, temperament, and dynamic traits represent additional categories of trait classification.He also makes a distinction between common and unique traits.

Cattell uses three types of data to identify source traits:

i)   life records(L-data),

ii) self-rating questionnaires(Q-data),and

iii) objective tests(OT-data).

The Sixteen Personality Factor Questionnaire(16 PF) was devised by Cattell to measure source traits using self-report data.

He also developed a statistical tool called multiple abstract variance analysis to estimate the relative contributions of heredity and environment to a given trait.

He estimates that one-third of personality is determined by genetics and two-thirds by environmental influences.

Finally, he has studied how the syntality or defining characteristics of groups influence personality.

2.9   UNIT END QUESTIONS

1)   Define Cattell's trait theory of personality

2)   How do Allport and Cattell differ in their approaches to classify personality traits?

3)   How does Cattell conceptualise "trait". To what extent, if any, he agrees that traits interact with situations to determine behaviour?

4)   Give details of 16 PF as put forward by Cattell.

5)   Define ability, temperament and dynamic traits.

6)   Describe with suitable examples common and unique traits.

7)   What is syntality and how does Cattell use the same in explaining group traits?

8)   What are the various types of traits? Discuss with suitable examples.

2.10   GLOSSARY

Ability trait	:	A trait that determines the person's effectiveness and skill in the pursuit of goals.
Constitutional trait	:	A source trait that is rooted in biological and physiological condition of the person and very resistant to change.
Dynamic trait	:	A trait that activates and directs the person toward particular goals in a given situation.
Environmental mold trait	:	A source trait learned through experience with the environment.
Factor analysis	:	This is a Statistical procedure used to determine those psychological variables or test responses that cluster together within a matrix of intercorrelations. Factor analysis was used by Cattell and Eysenck to identify the underlying traits of personality structure.
Factor loading	:	Correlation between a single item and the factor to which it is being related.
L-data	:	Measures of behaviour in everyday life situations or ratings of such behaviour (e.g., interactions with peers).
OT-data	:	Measures of a person's performance on tasks that may be objectively scored(e.g., responses to an inkblot).
Q-data	:	Personality data obtained from self-report questionnaires(e.g., the 16 PF).
Sixteen Personality Factor Inventory(16PF)	:	Self-report test developed by Cattell to measure the 16 source traits of personality.

Source trait	:	Underlying structures that constitute the core or basic building blocks of personality, that is source traits are revealed through factor analysis in Cattell's system.
Specification equation	:	Formula to indicate that a person's response is a consequence of the stimulus situation at a given moment as well as all the traits relevant to the situation.
Temperament trait	:	A constitutional source trait influencing the person's emotional or stylistic quality of behaving.
Trait theory	:	Theoretical conception of personality that postulates the existence of underlying dispositions or characteristic that initiate and direct behaviour. Traits are typically inferred from overt behaviour or self-report measures.

2.11 SUGGESTED READINGS AND REFERENCES

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