

JOHN HOLLAND'S THEORY OF VOCATIONAL PERSONALITIES AND WORK ENVIRONMENTS

3.1 INTRODUCTION

The theory developed out of Holland's experience as a vocational counsellor and a clinician, from his wide reading of the vocational literature, as well as from his experience of constructing a personality/interest inventory (Holland 1966). He first introduced his theory in 1959, but it was from the 1970s, especially after the publication of the book *Making vocational choices: A theory of careers* (Holland 1973), that the theory became increasingly influential in the field of vocational psychology. Hackett, Lent and Greenhaus (1991) in a 20 year review of vocational theory and research noted that Holland's theory is the most visible and highly researched theoretical perspective since 1971. The theory has been a primary research topic in vocational psychology since its inception and has probably generated more research than any other theory of career behaviour. The use of his inventories is widespread (Walsh & Srsic, 1995). Holland's theory of vocational personalities and work environments is widely considered one of the most influential career development theories and occupational taxonomies in vocational psychology (Tracey & Rounds, 1993).

The theory has been characterized as a trait-factor theory, but Chartrand (1991) posited that the trait-factor model of career counselling had evolved into a person-environment fit approach and cited Holland's theory as the best known example of a theory of person-environment fit.

The purpose of Holland's (1959, 1966, 1973, 1985) theory is to organize and interpret personal and vocational information with a view to explaining and predicting how people make vocational choices. Central to his theory is the idea that both people and work environments can be classified into six types: Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E) and Conventional (C). Furthermore he specified a circular RIASEC ordering of the six types and environments called the hexagonal model.

It is assumed behaviour is determined by interaction between personality and environment and thus the theory predicts outcomes regarding optimal person-environment match. Examples of such outcomes are educational and vocational choice; educational and vocational achievement; vocational satisfaction, stability and change.

3.2 THE THEORY

Holland (1985:2-4) provided four assumptions that form the heart of the theory:

3.2.1 *In our culture, most persons can be categorized as one of six types [R, I, A, S, E, C].*

The theory was developed in the United States of America and early empirical studies were conducted mainly on white males (Holland, 1966) who were mostly undergoing tertiary education in the USA. "Our culture" thus refers to this population. However, many studies have since supported the validity and usefulness of the theory, the associated assessment instruments and the classification system for both males and females (Hansen, 1992), as well as for diverse nationalities and cultures (Arbona, 1990; Brand *et al.*, 1994; du Toit, 1988; Ferreira & Hood, 1995; Fouad, 1993; Holland, 1985; Holland & Rayman, 1986; Swanson, 1992a). Holland and Gottfredson (1992) noted that differences among national or ethnic groups were usually smaller than differences between men and women from the same group. They stated that gender differences were clearly linked to vocational interests and attempts to "erase" these differences through measurement manipulation were inappropriate. Prediger and Vansickle (1992b) pointed out that this referred to Holland and Gottfredson's preference for the use of raw scores, rather than normed scores. Prediger and Vansickle stated that many studies demonstrated that raw interest scores were less valid for use for career counselling. Brown (1990), however, stated that the Self-Directed Search employed raw scores, as opposed to normative scores, which resulted in women falling in the Social and Artistic categories more often than the Conventional or Realistic categories. This resulted in criticism that the instrument was sexist and that normative scores would result in different profiles for women. Holland's view was that the results reflected the social structure where women are socialized differently to men. Brown noted that Holland's theory explains existing

phenomena and counsellors should take these differences into account.

3.2.1.1 Development of the personality types

Holland (1966, 1985) described the process of the development of a certain personality type in a person in the following way. The process is influenced to some degree by the personality types of the parents who provide environmental opportunities and deficits as well as an inherited component of physical and psychological potentials. To some extent types produce types. Other influences such as school relations and friends contribute to the process. A child will manifest preferences for certain activities and aversion to others. Engaging in the preferred activities leads to strong related interests, values and competencies. These interests and competencies create a certain personal disposition or way of perceiving and interacting with the world and this culminates in a personality type.

"In the theory, development over the entire life course can be understood as a long series of person-environment interactions in which people are modified and stabilized as they select, pass through, or avoid behavior situations that reject, select, and encourage some behavioral or personality repertoires more than others." (Holland 1985, p. 52)

Eberhardt and Muchinsky (1984) found that significantly different personal life-history experiences differentiated the lives of members of RIASEC vocational types. Moloney, Bouchard and Segal (1991) used the Strong-Campbell Interest Inventory (SCII) and the Jackson Vocational Interest Survey to investigate the vocational interests of monozygotic and dizygotic twins reared apart and found that 40-50% of the variation in vocational interests was genetic in origin. The sample was mainly female with a mean age of about 40 years and consisted mostly of mature adults with considerable work experience. Common family environmental influences on vocational interests appeared to be virtually absent. Differences in parental treatment and physical facilities in the rearing environment appeared to be unrelated or only slightly related to individual differences in vocational interests. Both Walsh and Srsic (1995) and Watkins and Subich (1995) reviewed research that indicated that approximately 50% of variance in vocational interests was attributable to genetic influence.

In a study of 949 elementary school children Trice, Hughes, Odom, Woods and McClellan (1995) found some support for the theoretical positions of Ginzberg, Gottfredson, Havighurst and Roe with respect to the role of childhood in career development. Support was found for Ginzberg's position that interests play a major role in both the selection and rejection of occupations throughout childhood. From Roe's theory evidence was found that family configuration influenced occupational choice/no choice. Support was found for Havighurst's idea that identification with a parent's work is particularly strong among younger children, but this effect diminished by the sixth grade. From Gottfredson's theory support was found for age-graded concerns with respect to sex role, prestige and ability as reasons for rejecting occupational options, and for her hypothesis of a narrowing of occupational interests during childhood. Lubinski, Benbow and Ryan (1995) found in a 15-year longitudinal study (spanning the age period of 13 to 28 years) of gifted adolescents that the dominant RIASEC type at age 13 was highly likely to be either the dominant or adjacent type at age 28. These findings support Holland's theory of the development of vocational interests.

3.2.1.2 Description of the types

Descriptions of the types are summarized in Tables 3.1a and 3.1b on the following two pages.

3.2.1.3 Literature on the personality types

Holland (1985) in a review of the literature for the period 1959 to 1983 reported that the evidence from correlational studies investigating the relationship between the Vocational Preference Inventory (VPI) or the Self-Directed Search (SDS) and a wide range of personality inventories supported the description of the types. Tokar and Swanson (1995) referred to research that supported the validity of Holland's trait characterizations of the types. In the studies referred to, VPI or SDS scores were related to a wide range of measures of personality such as Cattell's 16 Personality Factor Questionnaire (16PF), the Edwards Personal Preference Schedule, the Myers-Briggs Type Indicator (MBTI) and the Neuroticism-Extraversion-Openness (NEO) Inventory. However, these authors cautioned that the evidence was often not especially consistent or robust.

TABLE 3.1a: THE HOLLAND PERSONALITY TYPES

REALISTIC	INVESTIGATIVE	ARTISTIC
PREFERRED ACTIVITIES AND RESULTANT COMPETENCIES		
The Realistic person prefers activities that entail the explicit, ordered, or systematic manipulation of objects, tools, machines and animals. This leads to the acquisition of manual, mechanical, agricultural, electrical and technical competencies.	The Investigative person prefers activities that entail the observational, symbolic, systematic and creative investigation of physical, biological and cultural phenomena in order to understand and control such phenomena. This leads to the acquisition of scientific and mathematical competencies.	The Artistic person prefers ambiguous, free, unsystematised activities that entail the manipulation of physical, verbal or human materials to create art forms or products. This leads to the acquisition of artistic competencies - language, art, music, drama, writing.
HAVE AN AVERSION TO:		
The Realistic person has an aversion to educational or therapeutic activities and has deficits in social and educational competencies.	The Investigative person has an aversion to persuasive, social and repetitive activities and has deficits in persuasive competencies.	The Artistic person has an aversion to explicit, systematic and ordered activities and has deficits in clerical or business system competencies.
PERCEIVE THEMSELVES AS:		
They perceive themselves as having mechanical and athletic ability and lacking ability in human relations.	They perceive themselves as scholarly, intellectual, having mathematical and scientific ability and lacking in leadership ability.	They perceive themselves as expressive, original, intuitive, nonconforming, introspective, independent, disorderly, having artistic and musical ability and ability in acting, writing and speaking.
THEY VALUE:		
They value concrete things or tangible personal characteristics - money, power and status.	They value science.	They value aesthetic qualities.
PERSONALITY TRAITS AND CHARACTERISTICS		
Asocial Conforming Frank Genuine Hard-headed Materialistic Natural Normal Persistent Practical Self-effacing Inflexible Thrifty Uninsightful Uninvolved	Analytical Cautious Critical Complex Curious Independent Intellectual Introspective Pessimistic Precise Rational Reserved Retiring Unassuming Unpopular	Complicated Disorderly Emotional Expressive Idealistic Imaginative Impractical Impulsive Independent Introspective Intuitive Nonconforming Original Sensitive Open

TABLE 3.1b: THE HOLLAND PERSONALITY TYPES

SOCIAL			ENTERPRISING			CONVENTIONAL		
PREFERRED ACTIVITIES AND RESULTANT COMPETENCIES								
The Social person prefers activities that entail the manipulation of others to inform, train, develop, cure or enlighten. This leads to the acquisition of human relations competencies such as interpersonal and educational competencies.			The Enterprising person prefers activities that entail the manipulation of others to attain organizational goals or economic gain. This leads to the acquisition of leadership, interpersonal and persuasive competencies.			The Conventional person prefers activities that entail the explicit, ordered, systematic manipulation of data, such as keeping records, filing materials, reproducing materials, organizing written and numerical data according to a prescribed plan, operating business machines and data processing machines to attain organizational or economic goals. This leads to the acquisition of clerical, computational and business system competencies.		
HAVE AN AVERSION TO:								
The Social person has an aversion to explicit, ordered, systematic activities involving materials, tools or machines and has deficits in manual and technical competencies.			The Enterprising person has an aversion to observational, symbolic and systematic activities and has deficits in scientific competencies.			The Conventional person has an aversion to ambiguous, free, exploratory or unsystematised activities and has deficits in artistic competencies.		
PERCEIVE THEMSELVES AS:								
They perceive themselves as liking to help others, understanding others, having teaching ability and lacking mechanical and scientific ability.			They perceive themselves as aggressive, popular, self-confident, sociable, possessing leadership and speaking abilities and lacking scientific ability.			They perceive themselves as conforming, orderly and as having clerical and numerical ability.		
THEY VALUE:								
They value social and ethical activities and problems.			They value political and economic achievement.			They value business and economic achievement.		
PERSONALITY TRAITS AND CHARACTERISTICS								
Ascendant	Helpful	Responsible	Acquisitive	Energetic	Flirtatious	Careful	Inflexible	Persistent
Cooperative	Idealistic	Sociable	Adventurous	Exhibitionistic	Optimistic	Conforming	Inhibited	Practical
Patient	Empathic	Tactful	Agreeable	Excitement-seeking	Self-confident	Conscientious	Methodical	Prudish
Friendly	Kind	Understanding	Ambitious	Extroverted	Sociable	Defensive	Obedient	Thrifty
Generous	Persuasive	Warm	Domineering		Talkative	Efficient	Orderly	Unimaginative

HOLLAND J.L. (1985). *Making vocational choices: A theory of vocational personalities and work environments* (2nd ed.;pp. 20-22). Englewood Cliffs, N.J.: Prentice-Hall.

In a study by Williams (1972) 145 randomly selected male graduate students from 18 departments were sorted according to Holland type. The students completed, amongst other inventories, the 16PF and the VPI, a forerunner of the SDS consisting of occupational titles. The VPI scales correctly classified 93 of the 145 students. It was found that personality characteristics, as measured by the 16PF, were significantly related to occupational choice. The 16PF scales correctly classified 83 of the 145 students according to Holland type. Discriminant analysis showed that the Investigative, Realistic and Conventional groups were the purest groups (most well-discriminated) and the Enterprising group was the least well-discriminated. This study provided strong evidence that field of study is partially dependent on personality (Holland, 1985).

Holland (1985) reported on a doctoral study completed by Nord in 1976 in which undecided students completed the MBTI and the SDS. Correlations between scales of the two instruments were in predictable directions. Holland (1985, p. 66) cited the following examples: *"Artistic correlates -.46 with Sensing, .26 with Intuition, -.41 with Judgment, and .38 with Perception. In contrast, Conventional correlates .34 with Sensing, -.20 with Intuition, and -.20 with Perception."* Holland noted that the results are particularly impressive as SDS profiles for undecided students are often flat and unproductive.

Weil, Schleiter and Tarlov (1981) reported on a study of the career aspirations of medical residents with a view to identifying characteristics that differentiate future generalists from future subspecialists in medical training. A sample of 468 residents surveyed in 1977 completed the VPI and the results were used to investigate the relationship between personality and career choice. The authors observed that the two groups were very similar, largely preferring Investigative and Artistic activities. Future generalists were relatively more interested in Social occupations and future subspecialists were relatively more interested in Investigative and Artistic occupations.

Bolton (1985) used the 16PF profiles given in the *Handbook for the 16PF* for 69 occupational groups to investigate the relationship between the 16PF and Holland's six personality types. The 69 occupational groups were each assigned to one of the six Holland occupational types. Analysis was based on only the first letter of the three-letter Holland occupational classification. Multiple discriminant analysis was

carried out on the data. Three discriminant functions were obtained: Independence (imaginative, unpretentious, non-conforming, liberal, self-sufficient, sensitive, reserved and dominant), Extroversion (group dependent, outgoing, undisciplined) and Anxiety (tense, apprehensive, less intelligent, suspicious and less stable). Twelve of the 16PF scales significantly differentiated among the six types. Personality profiles were drawn up for each of the six Holland personality types. The Artistic type was the most different and thus best defined type, followed by Investigative, Enterprising, Realistic, Conventional and Social. The Conventional and Social types fell near the mean on most of the 16PF scales and few unique descriptive personality characteristics could be assigned to them. The personality profiles constructed for the six Holland personality types are as follows:

Artistic. Reserved, detached; affected by feelings, easily upset; assertive, aggressive; expedient; sensitive; suspicious, self-opinionated; imaginative; unpretentious; apprehensive, worrying; experimenting, liberal; self-sufficient, resourceful; undisciplined, careless; tense, driven.

Investigative. Reserved, detached; more intelligent; emotionally stable, mature; trusting, adaptable; self-assured, confident; self-sufficient, resourceful; controlled, socially precise; relaxed.

Enterprising. Outgoing, participating; less intelligent; conscientious, persevering; shrewd, calculating; group-dependent, a "joiner" and sound follower; controlled, socially precise; relaxed.

Realistic. Less intelligent; self-reliant, realistic; practical, careful, conventional; conservative; controlled, socially precise.

Conventional. Accommodating, conforming; self-reliant, realistic.

Social. Group dependent, a "joiner" and sound follower.

In a study by Neethling (1986) 378 Afrikaans and 252 English male adolescents aged 17 - 24 years completed the SDS and the 16PF. The six Holland personality types differed with respect to certain personality characteristics as measured by the 16PF

and the differences supported the descriptions of the Holland types. Adolescents classified as Realistic were introverted with high scores on the Tough Poise [Corterial] second order factor; [(A-) reserved, detached, critical, aloof; (I-) tough-minded, self-reliant, realistic; and (M-) practical]. The Investigative group had high scores on Tough Poise, were independent with low anxiety scores. The Artistic group had low scores on Tough Poise [(I+) and (M+)]. The Social and Enterprising types were Extrovert with low Tough Poise scores. The only significant difference for the Conventional group was lower B [crystallized intelligence] scores.

Karol (1994) used correlations, regressions and mean profile differences in a study using 194 graduate and undergraduate students (79 males and 115 females) ranging in age from 17 to 50 to investigate the ability of the 16PF to predict vocational interests as measured by the SDS. Substantial relationships between personality scales and vocational interests were found and findings were similar to those of previous studies. Overall, findings indicated that Realistic types were tough-minded, Artistic types were receptive and emotional, Social and Enterprising types were extroverted and Investigative types were introverted with good reasoning skills. Similar to previous findings the Conventional type was not distinguished by specific personality traits. Using regression analysis, the second order factor Tough-Mindedness predicted each type. Realistic, Investigative, Enterprising and Conventional types were predicted by high scores, whereas Artistic and Social types were predicted by low scores. Anxiety did not strongly predict vocational type, except for Realistic types who were predicted by low anxiety. Karol summarized previous research findings of relationships between 16PF scales and vocational interests. The summary of previous research findings for each vocational type is given below, followed by the findings of Karol's study.

Realistic types are distinguished by elements of Tough Poise, suggesting that they are more likely to process information based on facts rather than feelings. They are reserved [A-], objective [I-] and practical [M-]. They also tend to be controlled [Q3+].

Karol found Realistic types to be characterized by Tough-Mindedness and low Anxiety. They were low on warmth [A-], sensitivity [I-] and apprehension [O-].

Investigative types are somewhat introverted being reserved [A-] and self-sufficient

[Q2+]. They exhibit good reasoning skills [B+], an experimenting liberal outlook [Q1+] and control [Q3+]. They are usually low on anxiety.

Karol found Investigative types to be introverted and low on warmth [A-], high on reasoning [B+] and low on sensitivity [I-].

Artistic types are characterized by emotionality. They are sensitive [I+], imaginative [M+] and liberal in outlook [Q1+]. Dominance [E+], expediency [G-] and good reasoning ability [B+] also distinguish Artistic types. There are indications of introversion as they tend to be reserved [A-] and self-reliant [Q2+]. Some studies have shown that they score highest on anxiety and reveal a general trend of emotional reactivity [C-] and tension [Q4+].

Karol found Artistic types to be independent and extroverted, with low scores on tough-mindedness and self-control. They were expedient [G-], socially bold [H+], sensitive [I+], abstracted [M+] and open to change [Q1+].

Social types are somewhat extroverted. They are outgoing [A+] and group-dependent [Q2-]. They have good reasoning skills [B+]. This is one of the least distinctive of the types in research studies as most of the traits fall at or near the mean.

Karol found Social types to be extroverted, independent and receptive and open as indicated by low scores on Tough-Mindedness. They were warm [A+], lively [F+], socially bold [H+], personally open [N+] and group oriented [Q2-].

Enterprising types are extroverted. Like the Social types they are outgoing [A+] and group-dependent [Q2-], but they also tend to be venturesome [H+] and enthusiastic [F+] which enhances the active aspect of their extraversion. They are also dominant [E+], relaxed [Q4-] and controlled [Q3+].

Karol found Enterprising types to be extroverted and independent. They were warm [A+], emotionally stable [C+], dominant [E+], socially bold [H+], utilitarian [I-] and self-assured [O-].

Conventional types are the least distinctive in terms of personality traits with most scores falling at or near the mean. The most commonly noted characteristic is conscientiousness [G+] and they are usually humble [E-] and objective [I-].

Karol found Conventional types to be tough-minded and self-controlled, being more practical [M-] and perfectionistic [Q3+].

Randahl (1991) investigated the relations between typologies derived from vocational interests as measured by the General Occupational Theme (GOT) scale of the SCII and abilities as measured by the US Department of Labour's General Aptitude Test Battery (GATB). The GATB consists of eight paper-and-pencil and four apparatus tests measuring the following nine aptitudes: General learning ability, Verbal aptitude, Numerical aptitude, Spatial aptitude, Form perception, Clerical perception, Motor coordination, Finger dexterity and Manual dexterity. The sample was 846 vocational assessment clients (373 females with mean age 31.7 and 568 males with mean age 32.6) tested over an eight year period. The relations between high point codes measured by the GOT and ability scores of the GATB were analyzed. The results tended to confirm Holland's type-competency theoretical predictions. Persons with Realistic interests had significantly higher Spatial aptitude and Form perception abilities than other types. The Investigative interest group had significantly higher Verbal ability, Numerical aptitude and Spatial aptitude. The Social interest group was significantly higher on Motor coordination and the Artistic group tended to have significantly higher Verbal ability, Clerical perception and Spatial aptitude. The Enterprising and Conventional groups did not differ significantly in abilities from the other groups.

Borgen (1986) in a review of the assessment of interests and innovation in this field referred to the research of Costa, McCrae and Holland (1984) as "*the best research to date on the linkage of interests and personality*" (p.107) and listed the special strengths of their study as follows:

- (1) use of a personality measure tapping the full range of major dimensions within a normal population;
- (2) use of a personality inventory without explicit vocational interest items;
- (3) use of a moderately large adult sample with a full age range;

- (4) separate analyses for male and females;
- (5) use of homogeneous interest dimensions rather than heterogeneous occupational scales;
- (6) a six-month interval between administration of the personality inventory and the interest inventory, thus ensuring a conservative estimate of the relationship between interests and personality; and
- (7) supplementary assessment of personality with spouse ratings.

Costa *et al.* examined the relationship between Holland's interest-based personality types using the SDS and the Neuroticism-Extraversion-Openness (NEO) model of personality with a sample of 394 adults. Within the NEO model **Neuroticism** is represented by subscales of Anxiety, Hostility, Depression, Self-Consciousness, Impulsiveness and Vulnerability. **Extraversion** is represented by Warmth, Gregariousness, Assertiveness, Activity, Excitement Seeking and Positive Emotions. **Openness to Experience** is represented by Fantasy, Aesthetics, Feelings, Actions, Ideas and Values. Correlations indicated that Neuroticism was only inconsistently and weakly related to SDS scales and thus demonstrated a lack of linkage with Holland's personality types. Artistic and Investigative SDS scores were moderately positively correlated with Openness to Experience. Social and Enterprising SDS scores were moderately positively correlated with Extraversion. Costa *et al.* (1984, p. 397) concluded that "*personality dispositions show strong consistent associations with vocational interests*".

Gottfredson, Jones and Holland (1993) extended the work of Costa *et al.* (1984). A sample of 479 male and 246 female navy recruits completed the Vocational Preference Inventory (VPI) which measures the six RIASEC interest-based Holland personality types and the NEO Personality Inventory (NEO-PI). The NEO-PI measures five personality factors: Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness, and is an expansion of the NEO (Neuroticism-Extraversion-Openness) Inventory used in Costa *et al.*'s study. These five major personality trait dimensions have been recovered repeatedly in factor analyses of peer- and self-ratings of personality traits involving diverse conditions and populations (Tokar & Swanson, 1995).

Factor analysis revealed two significant factors for the female sample and four

significant factors for the male sample. However, only the first factor in both cases was large and easily interpreted and involved Artistic and Investigative interests and a personality style characterized by Openness.

Correlations between the VPI and NEO-PI showed several trends. There was a tendency for the six VPI personality scales to have small negative correlations with Neuroticism. Social and Enterprising scales usually were significantly positively correlated with Extraversion for the male sample, but correlations were smaller and nonsignificant for women. The Artistic and Investigative scales were positively correlated with Openness. The Conventional scale had significant positive correlations with Conscientiousness.

Gottfredson *et al.* (1993) also summarised correlations between Holland's six dimensions as measured by the SDS or the VPI, and the scales of a variety of personality inventories presumed to measure the five factors of the NEO-PI. Considering both the data of their study and the summarized data, Gottfredson *et al.* concluded that the personality variables represented by the five personality factors of the NEO-PI and Holland's six personality types are related. *"Extraversion is related to social and enterprising interests. Openness is related to investigative and artistic interests, and Control is related to conventional interests. Neuroticism has small negative correlations with all six Holland interest dimensions."* (Gottfredson *et al.*, 1993, p. 523). The authors also pointed out that as the Neuroticism, Likability and Control domains of the NEO-PI were not well represented in Holland's interest dimensions, counsellors should supplement Holland's formulations with such information to better understand client problems relating to work adjustment, job satisfaction, integrity and interpersonal relations in the workplace.

Holland, Johnston and Asama (1994) studied the personality types in a correlational study that used a sample of 175 men and 123 women who participated in a series of career workshops for displaced farmers, shoe workers, unemployed and employed workers. Participants completed the short form of the NEO Personality Inventory, the SDS and the Personality Styles Inventory (PSI), a measure developed to assess six personality disorders or styles from the *Diagnostic and Statistical Manual of Mental Disorders*. The NEO scales of Extroversion and Openness related to four of the SDS scales (Investigative, Artistic, Social and Enterprising) in expected ways. However,

the PSI scales only weakly related to the SDS scales. The authors concluded that the results supported the formulation of some of the Holland personality types.

Tokar and Swanson (1995) investigated the correspondence between the SDS and the NEO Five Factor Inventory (NEO-FFI), a short form of the NEO-PI, using a sample of adults (146 men and 213 women) employed in a wide range of occupations. Only data of participants with well-defined Holland personality patterns were analyzed. As there were significant differences in scores according to gender, data for men and women were analyzed separately. The authors found substantial relations between the Holland and NEO models, but the NEO five-factor model could not account for Holland's model in its entirety. For both genders Artistic and Investigative types were positioned at the "open" end of the Openness continuum, whereas Conventional and Enterprising types were positioned at the "closed" end. Although the findings concerning the Enterprising types would appear to be inconsistent with Holland's formulation of the type, the authors noted that a work environment populated with Enterprising types is probably more conservative than work environments populated by Artistic or Investigative types. For males, Enterprising types anchored at the extroverted end of the Extraversion and Friendliness continuum, and Realistic types were most introverted. For females, Artistic and Social types scored the highest on the Friendliness dimension whereas Realistic and Investigative types scored the lowest. Holland describes the Artistic type as asocial. The authors ascribed their finding of a relationship between Artistic type and Friendliness to the fact that the Artistic females sampled were represented by dance instructors and elementary school teachers. On the whole significant correspondence between Holland vocational personality types and some dimensions of the five-factor personality model were found providing further support for the validity of Holland's trait characterization of the types.

Strack (1994) investigated the relation between Holland's types measured by the SDS and Millon's eight basic personality styles measured by the Personality Adjective Check List. The sample consisted of 75 male and 77 female college students. Among men, Holland's Enterprising, Investigative, Artistic and Realistic types were associated with Millon's Socially Dominant (confident, forceful), Conscientious (respectful), Submissive (cooperative) and Neurotic (inhibited, sensitive) styles. Among women, Holland's Enterprising, Social, Conventional, Investigative, and

Artistic types were associated with Millon's Socially Dominant (confident, forceful), Conscientious (respectful), Submissive (cooperative), Introverted (introversion) and Extroverted (sociable) styles, although the pattern was different than that observed with men. The author concluded that on the whole Holland and Millon seemed closest in their conceptualization of social dominance-submissiveness and emotionality (neuroticism)-restraint (conscientious). They seemed more divergent in their views of social introversion-extroversion. Taken together the results indicated that the Holland and Millon systems are reliably, if modestly, linked at the dimensional level.

3.2.1.4 Assessment of the types

A person's personality type can be assessed qualitatively or quantitatively. A qualitative assessment could be made by using information about a person's educational and occupational preferences. For example, a person studying mathematics and wishing to become a mathematician could be classified as Investigative.

Several instruments have been devised to quantitatively assess personality type. The first instrument devised by Holland in the 1970s was called the Vocational Preference Inventory (VPI). This instrument consists of a list of 84 occupational titles (14 for each of the six types). A person would indicate which occupations appealed to him or her and the six scales would be scored and profiled. The personal pattern or code was obtained by rank ordering the scale scores from highest to lowest.

Holland developed the Self-Directed Search (SDS), also in the 1970s, as a self-assessment instrument. The SDS incorporates the occupational lists of the VPI and is described in Chapter 6 (see 6.3.3.2).

My Vocational Situation (MVS) includes an 18-item Identity Scale to assess identity, a construct which Holland added when he revised his theory in 1985. *"This scale measures the clarity of a person's vocational goals and self-perceptions and is positively associated with having a small number of occupational goals that belong to a small number of main categories. Persons with low scores have many goals belonging to many main categories."* (Holland, 1985, p. 23).

The American College Testing Programme (ACT) published the Unisex edition of the ACT Interest Inventory (UNIACT) in 1981. The instrument consists of 90 items describing work-related activities. Items were selected to reduce sex differences. Scores for six basic interest scales corresponding to the six Holland personality types are obtained, as well as scores for the two Data/Ideas and Things/People summary scales. Scores are plotted on the World-of-Work-Map on which 23 job families are located in 12 regions representing combinations of the six Holland types with the data, ideas, things and people work tasks. (Borgen, 1986).

In South Africa the Human Sciences Research Council developed the South African Vocational Interest Inventory (SAVII) (Du Toit, Gevers & Harilall, 1992). The SAVII contains 126 items about preferred work activities which are divided into six fields representing the six Holland personality types. Each of the six fields is further subdivided into three subfields.

In 1972 a merger of the Strong-Campbell Interest Inventory (SCII) and Holland's classification took place and scales that assess Holland personality types were incorporated into the SCII (Borgen, 1986). A description of the merged-sex form of the Strong Interest Inventory (SII), a later version of the SCII, which consists of 264 scales, including the General Occupational Theme (GOT) scales which measure Holland's six personality types is given by Swanson (1992a).

3.2.2 There are six model environments [R, I, A, S, E, C].

The six environments share common constructs with the personality types and are defined using the same descriptions of activities, competencies, perceptions and values as the personality types. The environment is thus defined by describing its inhabitants as it is assumed that the environment and its effects are transmitted mainly through the people in the environment. The relationships between the six environments are represented by the hexagonal model. Holland (1985) devised the Environmental Assessment Technique (EAT) to categorize environments. An environmental type is determined by surveying the personality types represented in a specific environment. The environment is then assigned a six-letter code according to the percentages of Holland personality types occurring in that environment. In an academic environment the curricular composition of a college or university is used to

assign a code. An alternative method used to define an environment is to use the Holland code of the worker's actual job or a student's actual college major. The concepts of differentiation and consistency with respect to the environments are also similarly defined as for the personality types. Differentiated environments offer a small range of activities and undifferentiated environments a wide variety of activities. Consistent environments offer similar rewards and demands.

Holland (1985) reported on research on categorizing environments. In educational settings environments differ according to field of study in ways that are consistent with theoretical predictions. In occupational settings personal interests are correlated with the demands of an occupation and the relations between interest profiles and occupational environments are consistent with theoretical predictions.

3.2.3 *People search for environments that will let them exercise their skills and abilities, express their attitudes and values, and take on agreeable problems and roles.*

The theory assumes that people seek out environments compatible with their skills, abilities, attitudes and values where they can take on roles agreeable to them. Thus Artistic types seek artistic environments, Realistic types seek realistic environments, and so forth.

A person in a compatible environment is encouraged to express the skills and attitudes they prefer and value in a congenial setting, thus enhancing self-esteem. A person in an incompatible environment would feel out of place and possibly inadequate.

Holland (1985) referred to research that demonstrated that different personality types perceive and process information differently and that vocational interests correlate with these differences. Witkin's work has shown that field-independent people prefer the natural sciences and mathematics, whereas field-dependent people prefer people-orientated fields of study such as teaching and social work. Holland referred to a doctoral study by Cleveland in which the Holland personality types and field independence-dependence were correlated in the expected directions. However Holland noted that on the whole the evidence for the relation of cognitive styles to Holland personality types is weak and often inconsistent.

Richards (1993) investigated the career development of 2710 population scientists in a longitudinal study spanning 10 years. The Holland type of the sample (IES) was measured on five different occasions and remained stable over time and within-type longitudinal correlations were substantial. Richards concluded the results provided broad support for Holland's theory and its application to career development through the life span.

3.2.4 Behavior is determined by an interaction between personality and environment.

Holland (1985) formulated a number of vocational/educational hypotheses related to personality types, environmental models and person-environment fit that flow from the formulations of the theory. The following three are relevant to this study (Holland, 1985, pp. 31-32).

- (i) *A person's dominant type determines the primary direction of vocational choice.*
(See 3.2.9)
- (ii) *Educational achievement goes with the following personality pattern order: I S A C E R.*

In a study by Schneider and Overton (1983) first-year university students were assigned a primary personality code based on SCII scores. The single personality code and academic achievement were correlated at the end of the first semester. I, S, A and C males and females obtained the highest academic achievement (GPA) and I and A males achieved higher marks than E students. Controlling for aptitude (SAT total scores) did not improve the accuracy of theoretical predictions with respect to personality type and academic achievement.

Schwartz (1991) reviewed dissertations during the period 1965 and 1990 relating to congruence and achievement. He selected eight studies, six of which investigated academic achievement and the other two investigated aspects of work achievement. Of the six studies investigating academic achievement only one supported Holland's hypothesis and three contradicted it. One study supported an Achievement-Oriented Personality Type (AOPT) interpretation and another study showed that

once the confounding effects of AOPT were controlled, strong support that had previously existed for Holland's hypothesis ceased to exist. The author concluded that the confounding effects of AOPT should be controlled in future research of the congruence-achievement hypothesis.

(iii) *Persons with different personality patterns respond to instructors, teaching methods and styles according to the formulations for the types. For example, a Social person should benefit from a Social teacher or a Social subject using personal teaching methods.*

In this study this is interpreted as meaning that certain personality types tend to have characteristic learning styles.

High levels of differentiation, consistency and congruence (where applicable) will increase the probability that these hypotheses will hold.

The four key assumptions discussed in 3.2.1 to 3.2.4 above are supplemented by the following key constructs, namely differentiation, consistency, identity, congruence and the classification system which are used to increase the interpretative value of the personality - environment model. A hexagonal model is used to illustrate the relationships between types and environment. A further six principles are given following descriptions of the constructs listed below.

3.2.5 The hexagonal model

A hexagon model is used to visually depict the relationships within and between types or environments (see Figure 3.1). The distances between the types or environments are "*inversely proportional to the theoretical relationships between them*" (Holland 1985, p. 5). This is called the *calculus assumption* and means that adjacent types on the hexagon are most related and opposite types are least related, with alternating types having an intermediate level of relationship. Rounds (1995) noted that Holland's structural hypothesis has taken three forms: a simple RIASEC **circular order** hypothesis, the **calculus assumption** and the **hexagonal hypothesis** which in addition to the calculus assumption requires that the interpoint distances are equal for types

within adjacent categories, alternate categories and opposite categories. These equality constraints meet the requirements for a **circumplex** (Tracey & Rounds, 1993). Holland's proposed hexagonal structural model operationally defines the degree of consistency in a person's profile (see 3.2.7) and the degree of congruence between the person and their environment (see 3.2.9). It thus plays an important role in the theory and has been extensively researched.

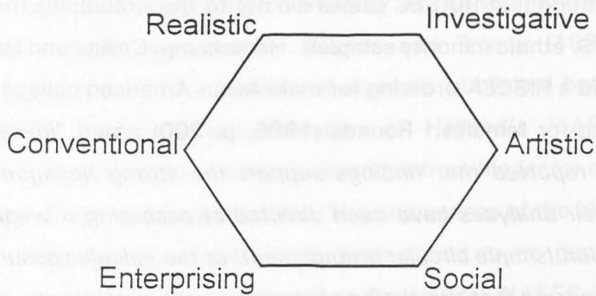


FIGURE 3.1 THE HEXAGON MODEL

Holland and Rayman (1986) described how the hexagonal model originated. Whitney and Holland observed that correlations between the six personality types resulted in a circular RIASEC formation. As Roe had claim on a circular formation at the time, Holland decided on a hexagonal model. Subsequent research has shown that an exact hexagonal configuration is not supported and Holland (1985, p. 119) confirmed that *"the hexagons resulting from real-world data are misshapen polygons"* possibly due to defects of theory, assessment or sample. Holland has not adjusted his theory to account for this. Swanson (1992b, p. 232) noted that *"the basic utility of the hexagon apparently is not in question, but the conditions of maximal utility are in question."*

Eberhardt and Muchinsky (1984) pointed out that studies seeking to validate the hexagonal/structural model fall into three categories.

The first type of study compares the pattern of item clusters measuring vocational interests to see if they conform to one of the structural hypotheses. Rounds (1995) synthesized the results of 60 correlation matrices found in test manuals and journals

through the application of multidimensional scaling in order to evaluate RIASEC structural hypotheses. Rounds (1995, p. 209) drew the following conclusions: *"The findings provide impressive support for Holland's structural hypothesis with measures that are presumed to assess the RIASEC types. The evidence not only supports the simple order hypothesis, but also supports Holland's stronger structural hypothesis, the calculus assumption."* However Tracey and Rounds (1996) reported that this empirical support related to U.S. samples and less support had been generated cross-culturally. They found that RIASEC scales did not fit the circumplex model for either international or U.S. ethnic minority samples. Haverkamp, Collins and Hansen (1994), for example, found a RISCEA ordering for male Asian-American college students and a RIASCE ordering for females. Rounds (1995, p. 200) noted *"investigators have often mistakenly reported that findings support the strong hexagonal hypothesis when, in fact, their analyses have been directed at assessing a weak form of the calculus assumption (simple circular arrangement) or the calculus assumption itself"*. Rounds (1995) reported that the choice of measurement instrument used in research to investigate the structural hypotheses may affect results obtained. He identified the UNIACT and two earlier versions of the Strong SII measure (the SVIB and SCII) as providing RIASEC measures which best fit the RIASEC order hypothesis and the calculus assumption model. Intermediate measure-model fits are provided by the SDS and VPI. Using these Holland measures, a greater proportion of Social codes for women and Realistic codes for men are found, where the RIASEC codes are more evenly distributed with the UNIACT and Strong measures. Poor fits are obtained by alternative forms of assessment such as the Career Assessment Inventory-Vocational Edition (CAI-V) and the Career Decision Making Inventory (CDM).

The second type of study investigates and proposes alternative geometric models to the hexagonal model, such as Gati's (1991) hierarchical model. Such studies show that the null hypothesis of random ordering of vocational types is consistently rejected and that alternative configurations may be plausible. Tracey and Rounds (1993) found both Holland's order model and the circumplex model to be adequate representations of the structure of vocational personalities and work environment and were found to be superior to Gati's model.

The third type of study tests the validity of the hexagonal/structural model using variables other than vocational interests. Eberhardt and Muchinsky (1984) noted that

such studies are relatively rare and they considered them to be the strongest test of Holland's model. These authors used biodata to predict vocational type and their results "*highly supported*" Holland's calculus assumption model (Eberhardt & Muchinsky, 1984, p. 180).

Prediger and Vansickle (1992a) showed that a two-dimensional map (with bipolar axes Data/Ideas and People/Things) superimposed on Holland's RIASEC circumplex can be used to plot occupations according to similarity of RIASEC interests. This model assumes the circumplex hypothesis. Rounds and Tracey (1993) conducted a structural meta-analysis of 77 correlational matrices published between 1965 and 1989 to evaluate Prediger's representation of Holland's RIASEC circumplex. Prediger's model received support when predictions from his factor model conformed to the predictions of the circumplex model. The uniqueness of the bipolar dimensions was not supported, but these dimensions were found to be generalizable across subject variables (gender and age) as well as for several RIASEC inventories. The authors concluded that the circumplex structure itself was the crucial distinguishing feature.

Research continues on the verification of the hexagonal structure. Myers (1996) proposed a simple procedure for testing the full circumplex model based on the Spearman rank-order correlation coefficient, rather than using sophisticated methods such as the structural equation modelling used by Rounds, Tracey and Hubert (1992).

3.2.6 Differentiation

Differentiation is the degree to which a personality type or environment resembles the theoretical description of the six types or environments. It is concerned with the range of scores obtained on an instrument such as the VPI or the SDS and is expressed as a numerical value which is the magnitude of the difference between the highest and lowest RIASEC scores. The greater the difference between the highest and lowest scores, the greater the differentiation. Holland described a well differentiated pattern as having "*sharp peaks and low valleys*" (Holland, 1985, p.26). A person with a highly differentiated personality pattern would represent a single personality type, whereas a flat personality pattern would represent a person with characteristics of a number of different personality types. Likewise the extent to

which an environment is defined is its degree of differentiation. Lachon (1984a, 1984b) derived two indices of differentiation through sophisticated mathematical reasoning. These indices take account of a wider range of scores than just the highest and lowest scores which are used to calculate Holland's index of differentiation. Alvi, Khan and Kirkwood (1990) compared five indices of differentiation, including Lachon's two and Holland's. Lachon's indices were most similar to each other and to an index proposed by Spokane and Walsh. Alvi *et al.* suggested that Lachon's indices should be used as measures of differentiation.

Holland (1985) reported that only a few studies investigating differentiation have reported positive results. He suggested that negative findings in some instances could be attributed to poor research design, small samples and failure to control for such variables as SES and intelligence. Three large-scale studies reported positive findings. In one study level of differentiation was positively related to stability of vocational choice for male students. Results for female students were not significant. In another longitudinal study involving high school pupils differentiation increased over a one-year period and vocational choices for the high differentiation group were more stable. In the third study also involving high school students it was found that good decision makers had differentiated profiles.

3.2.7 Consistency

Consistency is the degree of relatedness between personality types or between environments. There are three levels of consistency depending on the positions of types or environments in relation to each other on the hexagon. The types or environments that are next to each other on the hexagon share more traits and characteristics and are thus more closely related than types or environments that are separated from one another by one or two others. For example, the Realistic and Investigative types are highly consistent; the Realistic and Artistic types are moderately consistent; and the Realistic and Social types have low consistency. An inconsistent person would be less predictable as they have a greater diversity of interests, skills and values. This implies that they have a greater repertoire of possible behaviours. Strahan (1987) proposed an alternative method to Holland's of calculating consistency. An index of consistency is obtained using all three letters in a person's code rather than just using the first two letters as Holland proposes, thus

yielding a more differentiated index. Strahan and Severinghaus (1992) proposed a method of dealing with ties in codes.

Holland (1985) noted that research with respect to consistency had yielded mixed results, but when studies were well-designed and follow the theory closely positive results were obtained. Consistency had been shown to have strong positive relation with stability of college students' vocational aspirations, as well as their tendency to persist in college. Consistency had also been shown to have a strong positive relation with occupational stability in working populations.

3.2.8 Identity

In his revision of the theory, Holland (1985) added a new construct **Identity** which is related to the constructs of Differentiation and Consistency. Personal identity is defined as "*the possession of a clear and stable picture of one's goals, interests and talents*" (Holland, 1985, p. 5). Identity is assessed by the Identity Scale of My Vocational Situation (MVS) and measures "*the clarity of a person's vocational goals and self-perceptions*" (Holland, 1985, p. 28).

Holland (1985) cited evidence supporting the construct validity of the Identity Scale of the MVS. Chartrand and Camp (1991) in a 20-year review of measurement of career development constructs noted that the Identity Scale appeared to be the most frequently used measure of vocational identity. The theorized relation between vocational identity, and consistency and differentiation was not demonstrated by Leung, Conoley, Scheel and Sonnenberg (1992) in a sample of 211 male and 353 female academically superior high school juniors and the authors concluded that "*vocational identity' remains a fuzzy concept.*" (p. 105). Hackett and Lent (1992) reviewed several studies that investigated Holland's concept of identity. Studies using college students found the concept to be related to career maturity, variety of career options considered, perceived academic adjustment, but not to college grades. Consistent and generally strong relations have been observed between identity and measures of career decidedness or choice certainty/confidence. Vondracek (1992, p. 139) stated that the construct of vocational identity defined by Holland "*is too simple and sterile to be of much use*" and proposed requirements for the development of an adequate conceptualization of the construct vocational identity.

3.2.9 Congruence

Congruence refers to the compatibility of a match between a personality type and an environment. The level of congruence is illustrated by the spatial arrangement of the hexagon model. For example, a Realistic type in a Realistic environment is highly congruent, while a Realistic type in a Social environment is incongruent. According to the theory congruence is associated with achievement, stability and satisfaction.

Holland (1985) noted that Iachan (1984b, 1990) had evolved an alternative index to the Holland index to calculate congruence. Holland described Iachan's index as mathematically superior and suggested that the simpler Holland index would probably be best suited to clinical work and that Iachan's index could be preferred for research purposes. To calculate Holland's index only the first letter of the person's code and the first letter of the occupation or environment's code are used. The method for calculating the Holland index is given in the SDS manual (Gevers, du Toit & Harilall, 1992). Iachan's M index is based on mathematical combinations of all six personality types, as are the Zener index of Zener and Schnuelle and the K-P index of Kwak and Pulvino. Spokane (1985) in a review of research on congruence reported that two studies had shown these three indices to be highly correlated. Gati (1985) proposed a method of computing congruence that takes into account the number of salient (i.e. significant) scales of each profile, the proximity of the types/fields in the hexagonal model (i.e. the consistency) as well as the relative number of ties or identical scales. More recently Brown and Gore (1994) compared 10 measures of congruence using simulated data. They found that none of the three-letter code measures were sensitive to differences among persons across the entire possible range of congruence scores. With one exception they were unable to make fine distinctions among people with like, but out of order, three-letter person and environment codes. The authors concluded that the K-P index is the only one that is maximally sensitive to differences among cases of like, but out of order, person environment codes. The authors then presented a new measure of congruence that retains the advantages of the K-P measure, but is easier to calculate.

Osipow (1987) emphasized the central importance of person-environment fit and interaction in the realm of vocational behaviour. It is a complex phenomenon encompassing variables such as needs satisfaction, performance capability and

achievement, and job choice and stability. Osipow noted that investigation of person-environment fit is hampered by a need to improve current assessment methods. Gati (1989) also highlighted the problems associated with defining and measuring congruence and using the construct as a predictor of vocational behaviour.

Much research has demonstrated that people usually study and work in an environment that corresponds to their personality type (Holland 1985). One of many studies that Holland referred to demonstrated that Engineering students coded as I-types persisted with greater frequency and tended to get better grades over a two year period than those coded as R or RI-types. Studies that focus on employee satisfaction, stability and achievement demonstrate a positive relation to occupational congruence, although the magnitude of the correlation coefficients is small (Meir, Melamed & Dinur, 1995). Spokane (1985) reviewed 63 studies on congruence and found that *"correlational studies consistently show significant, positive relationships between congruence and academic performance and persistence, job satisfaction, stability of choice, perceived congruence, and personality, but nonsignificant relations between congruence and self-concept or sociability."* (p.306). Spokane noted that research on congruence is impeded by overly simplistic or static research designs and a reliance on self-report criteria measures rather than, for example, actual behaviour. Further correlational studies are thus unlikely to increase understanding of congruence and he suggested alternative directions in research that include incorporating moderator variables, changes in congruence over time, or experimental manipulations.

Assouline and Meir (1987) conducted a meta-analysis of 41 different studies investigating Holland's congruence construct. Substantial relationships were found between congruence and job satisfaction (.21), especially when speciality within occupation was used (.42). Small and nonsignificant relationships between congruence and achievement (.06) and congruence and stability (.15) were found. Assouline & Meir (1987, p. 328) concluded that *"neither stability nor achievement can be predicted by any common measure of congruence or in any environmental reference."* Large differences in results were ascribed to the many different methods used to calculate congruence. Holland (1987b) in a response to Assouline and Meir's article confirmed that *"estimates of congruence which use more information (scale scores or profile shape) are more successful than simple categorizations of personal and environmental characteristics."* (p.338).

Gottfredson and Holland (1990) investigated congruence and job satisfaction in a longitudinal study of a group of newly hired bank tellers. Personality code was determined by VPI scores and Iachon's method of calculating congruence with the occupational code for teller (CES) was used. The study controlled for several possible nuisance or confounding variables and the authors found that person-job congruence did have substantial correlations with job satisfaction for the well-defined, homogeneous sample. Differentiation of VPI scores was calculated and was found to be negatively correlated with persistence and with work satisfaction.

Meir *et al.* (1995) used a broader understanding of the concept congruence to investigate if congruence related to variables other than satisfaction, stability and achievement. In a study of 120 Israeli professionals (lawyers, physicians and psychologists), three aspects of congruence (vocational, leisure and skill utilization) and six measures of well-being (occupational satisfaction, work satisfaction, anxiety, burnout, somatic complaints and self-esteem) were examined. Correlations among the congruence aspects ranged between .24 and .36 and correlated positively with occupational choice satisfaction, work satisfaction and self-esteem, and negatively with anxiety, burnout and somatic complaints. All three congruence aspects showed an additive effect: the higher the number of congruence aspects the higher the well-being scores. These findings were similar to those found in earlier studies by the authors on teachers.

Sutherland and Fogarty (1995) found evidence for the hypothesis that occupational stress and strain are inversely related to Holland measures of congruence. The relation was found to be small but significant and depended on the measure of congruence used, Iachon's M index being the best predictor.

3.2.10 The classification system

The classification scheme provides a useful framework for organizing information on persons, environments and their interaction.

A person does not resemble only one personality type, but rather is described by a personality pattern which is a profile of their resemblance to the types. A personality pattern or Holland personal code can consist of two to six types and can be derived

qualitatively or quantitatively. Usually a three-letter code is used.

Occupations likewise are assigned a three-letter code as a summary of the occupation's degree of resemblance to what are deemed to be the three most relevant occupational environments (see 3.2.2). Holland compiled The Occupations Finder which consists of lists of occupational titles with their associated Holland code. This was followed by the *Dictionary of Holland occupational codes* published in 1982. A South African dictionary of occupations was published by Taljaard and von Mollendorf (1987). Hansen (1992) noted that discrepancies in codes for same-named occupations occur in several sources that incorporate Holland's theory. This creates frustrations for career counselling professionals and makes comparison of results of research investigating aspects such as consistency and congruence difficult if different codes are used to classify the same occupation. Various methods of assigning Holland codes to occupations have been suggested (Viernstein, 1972). More recently Holland and Gottfredson (1992) developed a brief inventory to classify any occupation. Studies comparing the congruence of codes assigned according to different methods to same-named occupations have been undertaken (Harrington, 1993; Harrington, Feller & O'Shea, 1993).

3.2.11 Six further assumptions

The following **principles** as further assumptions to the theory were stated by Holland (1985, pp. 7-10):

- (1) *The choice of vocation is an expression of personality.*
- (2) *Interest inventories are personality inventories.*
- (3) *Vocational stereotypes have reliable and important psychological and sociological meanings.*

Holland (1985) summarized American research findings confirming this assumption. In the South African black population this probably would not be true. Due to limited access to education and training the number of different occupations represented in the black community until now has been limited to a small number of occupations

such as labourer, domestic, teacher, nurse and priest. A limited range of occupational role models and inadequate access to career information probably has resulted in black youth not developing a wide range of vocational stereotypes.

- (4) *The members of a vocation have similar personalities and similar histories of personal development.*
- (5) *Because people in a vocational group have similar personalities, they will respond to many situations and problems in similar ways, and they will create characteristic interpersonal environments.*
- (6) *Vocational satisfaction, stability, and achievement depend on the congruence between one's personality and the environment in which one works.*

3.3 PRACTICAL USE OF HOLLAND'S THEORY

3.3.1 Career counselling and career development as an aspect of student development

A major aspect of student development is the attainment of sufficient career maturity to make a suitable career choice.

Holland's theory explains and interprets vocational data and vocational behaviour and provides a cognitive structure for understanding and organizing information about self and occupational alternatives. The organization of occupational information, which is vast and complex, into one simple system that is readily comprehended by users and yet accommodates the complexity of occupations, makes the information more accessible and more easily understood. This assists the student in self-exploration which enhances career maturity. If the student is assisted by a counsellor, both can share and use the concepts of the theory.

Career interventions are helpful because the average person has little career knowledge and may not have a clear vocational identity. Career programmes could benefit personal and career development. These programmes could provide assessment opportunities, career information classified according to the theory,

information on education and training opportunities, and even information on job opportunities. Such programmes could be presented in group format by, for example, student counselling services and/or through computerized career guidance systems (Pickworth, 1991).

The use of instruments such as the SII, VPI and SDS which are closely modelled on the theory help to clarify self-knowledge. Holland (1985) suggested that the following three aspects be used as diagnostic criteria:

- The congruence between the personal code and the occupation and/or field of study the person is engaged in or intends to pursue.
- The consistency of the first two letters of the personal code.
- The differentiation of the personal profile.

Many positive signs such as high congruence, high consistency and a well differentiated profile, would indicate that the person needs less assistance with a career decision. The SDS, for example, was developed as a self-help instrument and its use, or the use of computerized career guidance systems, could help in making career interventions more easily accessible to more people. Counselling resources could be conserved for persons with remedial or complex requirements such as limited education and/or financial restraints.

Betz, Harmon and Borgen (1996) developed a measure of perceived self-efficacy or confidence with respect to the RIASEC types using college student and employed adult samples. High self-efficacy scores indicate an individual's confidence in his or her ability to perform in academic subjects or in occupational activities related to each RIASEC type. The authors indicated the possible use of such information in career counselling. High interest-high confidence themes are obvious areas for the client to explore, whereas low interest-low confidence themes could be rejected. In the case of high interest-low confidence themes the counsellor could possibly raise efficacy in the client thus providing additional areas to explore that might otherwise have been rejected. The authors felt that combining vocational interest measures with a confidence measure has potential in increasing educational and occupational options

to clients.

3.3.2 Education

Although Holland's theory evolved within the context of career assistance, it could be applied in wider contexts such as education, business and industry. Holland (1985) suggested that during the school years curricula and non-curricula experiences should aim to provide pupils with a wide range of activities representative of the six types to help children to understand themselves and their future options.

Claxton and Murrell (1987) noted that a teaching strategy could be seen as a classroom "environment". As research on Holland's theory indicated, people prefer particular environments. Faculty should be sensitive to this and not limit learning opportunities to any one mode. Even though an instrument such as the SDS does not easily translate into teaching strategies, the authors advocated faculty complete such an inventory to make them aware that certain teaching methodologies are more appropriate for some students than for others. A variety of learning activities is needed rather than the reliance on any one approach.

The theory suggests that teaching may be more effective if students and teachers are paired according to type, or if teaching styles could be adapted to accommodate student types (Holland, 1985).

3.4 CRITICISM OF THE THEORY

Hackett *et al.* (1991) noted that Holland has been exemplary for continual revision and refinement of the theory in response to substantive criticisms and disconfirmatory research findings. Holland published major revisions of the theory in 1973 and 1985.

A criticism levelled at the SDS in particular and at the theory in general is that the instrument and theory are sexist (Brown, 1990; Weinrach and Srebalus, 1990). This criticism has been addressed in section 3.2.1 and relates to the fact that men tend to score higher than women on the Realistic scale and women tend to score higher on the Social scale. Weinrach and Srebalus stated that this phenomena is a reflection of cultural influences and not an indictment of the SDS. Holland (1987a) stated that

he did not believe that women's careers required a separate theory.

Holland's description of the development of personality types given in 3.2.1.1 is seen to be inadequate and a major shortcoming of the theory (Brown, 1990; Weinrach & Srebalus, 1990). Holland (1987a) did not believe that adding more detail on personality theory and development would be useful. Krumboltz and Nichols (1990) suggested that the general learning model proposed by the social learning theory of career decision making (see 2.3.2.3) could adequately explain how people come to develop any combination of Holland's six personality types.

Holland is also criticized for not addressing the process of career decision making apart from indicating that persons with certain personality types seek environments in which they can implement values and perform tasks that they will find rewarding. The impact of environmental and economic factors on the process has also not been spelt out. Brown (1990) stated that some clarification of the decision-making process would make the theory more complete.

Holland (1987a) indicated that he is not inclined to pursue a developmental life-stage account of career development. This is seen by Brown (1990) to be a shortcoming.

One of the more recent criticisms of the theory concerns the hexagonal structure and concepts defined by the hexagon such as consistency and congruence. Holland has conceded that the dimensions of the hexagon are not regular, but the operationalization of the constructs consistency and congruence, which are defined in terms of an equilateral hexagon, have not been modified. Hansen (1992) proposed that the theory be modified in this respect to accommodate the individual differences of diverse populations. Subich (1992, p. 204) stated that "*the search for a single hexagon applicable to all persons may be too simplistic.*" Swanson (1992b) also thought more work was needed on the constructs of congruence and consistency. The theory needed to be expanded by adding moderating variables such as the processes of occupational compromise, perceptions of career-related barriers, racial identity attitudes, degree of acculturation, and existing opportunity structure. Schwartz (1992) took a more extreme view and felt that as the literature did not fully support the congruence hypothesis, that it was time to move beyond Holland's theory.

In an investigation of the structure of basic interests, Rounds (1995) concluded that strong support for Holland's structural hypothesis was obtained when assessment instruments developed to measure the six types were used. However, when instruments developed to measure a wide variety of occupational interests and basic interests, such as the Jackson Vocational Interest Survey, were used a poor fit of basic interests to Holland's model was found. Although Holland's ordered hypothesis could not be rejected, a linear order hypothesis was just as viable as the circular hypothesis for representing the internal relations of basic interest scales. Structural similarities and differences were found between men and women's vocational interests. Rounds acknowledged the advantages of the simplicity and generality of models such as those of Holland and Roe, but felt that "*six categories may not constitute the best representation of the vocational interest domain*" (Rounds, 1995, p. 226).

In pursuit of modifying the structure for greater accuracy Tracey and Rounds (1996) proposed a spherical model of vocational interest which resulted when they combined the RIASEC circumplex with a prestige hierarchy. Occupational prestige was incorporated in the model as they postulated that vocational interests declined in importance as interest in the prestige of an occupation increased. Hansen (1996) found the spherical model intriguing from a theoretical and scientific perspective, but thought it was too complex for implementation in career counselling with clients.

Hackett and Lent (1992) noted that studies on the personality pattern clarity hypotheses involving the constructs of differentiation and consistency have tended to yield disappointing results. Neither of these constructs has been found to uniformly predict choice stability which according to the theory they should. Consistency is related to the hexagon and is defined according to distances on it. The problems associated with the hexagon described above and in 3.2.5 probably strongly influence the usefulness of this construct. Brown (1990) proposed Holland drop the construct differentiation as its restricted definition in terms of the difference between the minimum and maximum scores on an instrument such as the VPI did not address the complexity of the entire personality pattern. Holland (1985) introduced the construct identity to improve the ability of the theory to describe clarity of a personality pattern, but Brown thought the construct was poorly defined and unlikely to compensate for the inability of differentiation and consistency to account for career behaviour.

Although Prediger and Vansickle (1992b, p. 217) believed that Holland's theory had stagnated, they preferred to "build on" rather than "moving on". These authors concluded that "useful theories are those that can be improved." (p. 218).

3.5 SUMMARY

In this chapter an overview of John Holland's person-environment theory is given. The six vocational personality types (Realistic, Investigative, Artistic, Social, Enterprising, Conventional) are described and research findings relating to the personality types are cited. The assumptions underlying the theory are presented and key constructs of the theory, namely differentiation, consistency, identity and congruence are elucidated. A hexagonal model is used to illustrate the relationships within and between types and environments. The major application of the theory is in the field of career counselling, but Holland has suggested that it could be applied in wider contexts such as education, business and industry.

The theory does not address the nature of the development of personality types, the process of career development or the career decision-making process. However, the theory provides a framework for organizing and interpreting personal and vocational information which has been found useful by counsellors and individuals making career choices for nearly three decades. The theory currently remains one of the most influential and widely researched career development theories and represents in this study one approach to career development as an aspect of student development.

In the following chapter David Kolb's theory of experiential learning and learning styles will be described. In this study it represents one approach to academic development as an aspect of student development.