HEALTH BEHAVIOUR, PERSONALITY AND IRRITABLE BOWEL SYNDROME

by

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DISSERTATION

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SUMMARY

Although the irritable bowel syndrome (IBS) is one of the most common conditions referred to gastroenterologists in the developed world, it remains one of the least understood and hence most enigmatic of the functional gastrointestinal (GI) conditions, which are disorders without identifiable structural and organic abnormalities. The more common names of IBS include "spastic colitis", "spastic colon" and "irritable colon", which highlight the most salient complaints of sufferers ranging from abdominal pain, bloating or distension, through to various symptoms of disordered defecation.

The functional gastrointestinal disorders (GI) represent one of the greatest challenges for behavioural medicine for various reasons. Firstly, they are one of the many chronic disorders that accounts for more than half of all health problems in the developed world. Secondly, their causes, development and treatments are poorly understood; and thirdly, there is clearly a need for psychologically informed services. However, IBS can be conceptualized as a disorder that lends itself imminently to reinterpretation away from the biomedical model towards a more biopsychosocial paradigm, which conceptualizes the development of IBS to be a multicausal, complex process where both physiological and psychosocial processes are operative.

According to Drossman and other gastroenterologists (Drossman et al., 1994) working within the biopsychosocial model, psychosocial mechanisms like the influence of culture, family, personality, health behaviours, life stressors and coping mechanisms act as modulators of biological states. These modulating or mediating factors shape symptom severity, medication use and healthcare seeking or illness behaviour and ultimately determine the individual's so called Health Related Quality of Life (HRQOL). Of these mediating factors, this study seeks to investigate the role that personality and health behaviours may play in IBS, given that the personality-gut relationship represents the ideal interface for the study of the mind-body link.

Although past research suggests a strong role for personality influencing vulnerability to illness and illness progression, as well as health and health promotion (Booth-Kewley & Friedman, 1987; Marshal et al., 1994; Matthew & Haynes, 1986), the exact nature of this
relationship has not yet been determined. However, based on Friedman’s (1991) suggestion that personality operates through two routes, an internal route that links to stress and emotional dysfunction, and an external behavioural route, linked to personal lifestyle and habits of living, this study seeks to investigate whether certain personality dimensions and certain health behaviours can be associated with IBS. If any association can be discerned, then understanding the impact of personality through these two routes has enormous practical value for IBS sufferers.

In rising to the challenge presented by the functional GI disorders, this particular investigation adopts a more salutogenic perspective, focusing on the maintenance and enhancement of health over and above the prevention and treatment of illness (Strumpfer, 1990). In this regard, it appears that previous research has underestimated the role of personality as an influence on health behaviour, probably because of the failure to consider broad health behaviour dimensions as criteria, and because of the omission of important and equally broad personality dimensions. By building on recent conceptual developments in the medical, health and personality fields, the specific aim of this study was to examine the interaction between five broad personality domains and five broad health behaviour domains in relation to IBS.

As the collection and analysis of data occurred after IBS was diagnosed, the study used an ex post facto design to compare two groups of subjects with regard to ten variables as measured by two questionnaires, the Revised NEO Personality Inventory (NEO PI-R) and the Health Behaviour Checklist (HBC). The NEO PI-R was used to assess the respondents in terms of the five dimensions of Neuroticism, Extraversion, Openness to Experience, Agreeableness and Conscientiousness. The HBC was used to assess respondents in terms of their standing on the five broad health dimensions of Additional Items, Wellness Maintenance and Enhancement, Accident Control, Traffic Risk Taking and Substance Risk Taking. The research question, namely, “are there statistically significant differences between a group of IBS female subjects and a non-IBS control group in terms of the ten variables on these two measures taken together”, and the motivation for the study, arose out of a survey of the literature.

Both groups of subjects were recruited during 1996. The subjects were targeted through an extensive marketing campaign that involved meeting with general practitioners and
specialists, dieticians and various pharmaceutical companies. There were also various
newspaper and magazine articles released inviting participation in this study. The
sample was thus a self-selected group of IBS sufferers, probably largely composed of
health care seekers. According to Drossman and Thompson (1992), although many
persons experience IBS type symptoms, only a minority seem to present to doctors.

Hotelling's T-squared test was used to determine whether the vector of averages of the
IBS and non-IBS group were statistically different. Student's t-test was used to
determine in which subscales these differences were marked. A stepwise discriminant
analysis was also performed in order to ascertain which quantitative measurements
optimally discriminate amongst the two groups, the aim being to predict into which group
a new case is most likely to fall, or to obtain a small number of useful discriminating
variables.

Hotelling's T-squared test was statistically significant on both measures and Student's t-
test also showed significant differences between the two groups on both measures. In
terms of the NEO PI-R, significant differences were found to exist between the two
groups in terms of Neuroticism, Extraversion and Openness to Experience. The HBC
results revealed that there was a highly significant difference between the two groups in
terms of the Additional Items subscale, with the IBS group scoring much higher than the
control group. There were also significant differences in terms of the Wellness
Maintenance and Enhancement subscale on this same measure. The stepwise
discriminant analysis indicated that four factors contributed to the differentiation between
the two criterium groups, namely, in order of size of contribution: Additional Items (HBC);
Neuroticism (NEO); Wellness Maintenance and Enhancement (HBC) and Traffic Risk
Taking (HBC).

The study provides empirical evidence to support the theory that the development and
course of functional GI disorders, as with many other psychosomatic disorders, are in
constant interaction with several dimensions such as personality and health behaviours.
In terms of the internal biological route of personality, rather than revealing a typical
personality pattern unique to IBS sufferers, this study supports the emerging trend of
evidence indicating the tendency for a select group of IBS sufferers to report and seek
help for their symptoms and to display a more generic "distress-prone" personality
pattern. This pattern is characterized by the tendency to experience more negative emotions such as fear, anxiety, depression and hostility; to perceive more stressful life events and by a greater inability to cope with the stress generated by these events. The external behavioural route of personality reveals that health behaviours and life style also play a significant role in this disorder and suggests that suffering can be alleviated by addressing certain aspects of behaviour.

Despite the various limitations of the study, the results obtained on both internal and external routes of personality are extremely promising and have made some contribution towards understanding how personality can mediate the mind-body relationship. Based on the introduction of a more biopsychosocial approach to psychosomatic illness, the study also has implications for the treatment and management of people with IBS. It not only offers a more humane approach that takes greater cognizance of whole person functioning, but also legitimizes the need for more holistic approaches that include a psychological dimension.
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CHAPTER 1
Orientation, Motivation and Aims

1.1 Orientation and motivation
Disorders of the gut and their association with psychological variables appear to be as old as civilization itself, yet the precise nature of this mind-body relationship continues to elude those concerned with healing. As a result, the functional gastrointestinal (GI) disorders, which are disorders without identifiable structural and organic abnormalities, remain an area of gastroenterology that is poorly understood and whose causes are unknown (Drossman et al., 1994; Holzl, 1989).

Despite these problems, the results of collaborative international research in the field of gastroenterology indicate that progress is ongoing. In particular, the move away from the traditional biomedical model as the dominant model of disease towards a more holistic or biopsychosocial approach, represents a more humane and person-oriented approach that takes greater cognizance of the complexity of human functioning (Drossman et al., 1994; Engel, 1977; Lipowski, 1986).

The high prevalence of the functional gastrointestinal (GI) disorders, particularly in the developed world, both east and west, is cause for concern. Studies from several western countries indicate that approximately one in every four persons are afflicted with one or more gastrointestinal symptoms, although most do not seek medical care. Furthermore, the functional gastrointestinal disorders account for approximately half of all referrals to gastroenterologists in the developed world, of which irritable bowel syndrome (IBS) is the most common, comprising around one fifth to a half of these referrals. It appears that women are more likely to report and seek treatment for the functional GI disorders, as are younger persons between the ages of 15 and 44 (Drossman et al., 1994).

The high incidence of the functional GI disorders combined with insufficient knowledge about etiology and ineffective treatment modalities, are the source of enormous frustration for both doctors and patients alike. Not only are sufferers invariably subjected to costly and invasive diagnostic procedures and ineffective treatments, but state costs are high in terms of medical care and absenteeism.
According to Els et al. (1995) the morbidity of IBS is responsible for considerable work absenteeism, rating second only to the common cold.

Although it is generally accepted that personality plays an important role in the pathogenesis of functional disorders, research results on the link between personality and IBS specifically are controversial and sometimes contradictory (Suls & Rittenhouse, 1987; Tally et al., 1990). Although Tally et al. (1990) isolated no distinct personality profile for IBS patients, Devroede (1989) reports a direct link between personality and defecation patterns of healthy volunteers using the MMPI. Devroede (1989) also found the personality profiles between those with severe chronic idiopathic constipation to be completely distinct from those of arthritic controls.

The results of accumulated research on certain personality dimensions shows patients with IBS to be more neurotic, depressed and anxious than those with IBS who do not consult, and even more so than controls. They also seem to experience more stressful life events prior to the onset of IBS symptoms and do not cope as well with stress as do healthy volunteers. In addition, most studies indicate that mood and personality disturbance and psychiatric disease are more common in IBS patients seen by a hospital physician or specialist than in any other patients and in normal subjects. Although up to 70% of hospital patients with IBS have a psychiatric problem, usually anxiety or depression, their doctors regarded only 30% of these as having psychiatric disorders. In addition, patients with IBS also exhibit more chronic illness behaviour than those with organic GI disorders. This behaviour consists of frequent visits to the family practitioner, multiple somatic complaints and abnormal concern about minor illness (Bayne, 1997; Drossman et al., 1988; Drossman et al., 1994; Prior, 1995).

In spite of the ambiguous role of psychosocial factors, recent research reveals that psychological stress exacerbates GI symptoms; that psychological disturbances modify the experience of illness and illness behaviours such as health care seeking, and that such disorders may have psychosocial consequences (Drossman et al., 1994).

The personality-health relationship represents the ideal interface for the study of the mind-body link based on past research which suggests a strong role for personality influencing vulnerability to illness and illness progression, as well as health and health promotion (Booth-Kewley & Friedman, 1987; Marshall et al., 1994; Matthews...
& Haynes, 1986). Although the exact nature of this relationship has not yet been determined, recent evidence suggests that personality as it relates to health has explanatory and even predictive value (Smith & Williams, 1992). Apart from the internal route involving stress and emotional dysfunction, Friedman (1991) suggests that personality may also influence health through an external or behavioural route, which sees personality as impacting on health through personal lifestyle and habits of living. Based on research that lifestyle is seen to be responsible for at least half of all contemporary mortality and morbidity, especially the substantial rise in the chronic illnesses such as irritable bowel syndrome, Matarazzo (1984) argues that it makes sense to address health habits and behaviours and to focus on prevention and the making of positive lifestyle changes.

Given that overall patterns of health behaviours predict morbidity better than single behaviours, many are now realizing that an investigation of these could enhance our understanding of both personality and health. In fact, recent studies linking personality dimensions and health behaviours indicate that a connection between personality and lifestyle may be the basis for purported associations between personality and disease. If so, additional research into such a link not only promises easier identification of those at risk, but improved treatment interventions (Booth-Kewley & Vickers, 1994).

In light of the scanty as well as controversial and contradictory data on the personality-health relationship in general, the research question of this study is whether certain health behaviours and certain personality dimensions can be associated with the functional gastrointestinal disorders, particularly IBS. If any association between IBS, certain broad personality dimensions and broad patterns of health behaviour can be discerned, then understanding the impact of personality and certain lifestyles has enormous practical value for IBS sufferers.

1.2 Aims of the study

The aims of the study incorporate a general more encompassing aim as outlined in section 1.2.1 and a more specific operationalized aim as elaborated in section 1.2.2.

1.2.1 General aim

In light of the orientation and motivation given above, the encompassing aim of this study is the contribution of a greater knowledge and understanding of psychosomatic
illnesses as representative of the mind/body interface. Given the increasing awareness of the need for a more holistic approach towards understanding the functional gastrointestinal disorders, the overall objective of the broader Rand Afrikaans University IBS research project, of which this study forms a part, is to generate greater awareness and understanding of the association between physiology and psychology with regard to irritable bowel syndrome as experienced in a South African context. Investigations contributing towards the broader project include an examination of factors such as stress, anxiety, depression, somatization, psychopathology, early child sexual abuse, the role of defense mechanisms as well as different coping styles used. This particular study investigates the relationship with IBS of personality and health behaviours.

Given that knowledge of the functional GI disorders such as the enigmatic IBS is still at an embryonic stage, the conceptual changes occurring within the medical, personality and behavioural medicine fields have enormous implications for improving understanding of the complexity of whole-person care. This study aims to take advantage of these conceptual changes by not only furthering understanding of the link between IBS, personality and health behaviours but also, through the process, to attempt to generate firmer theoretical foundations for the understanding of IBS.

1.2.2 Specific aim
The present study relates to the personality and health behaviour differences between two groups of adult female subjects, the one group suffering from IBS and the second group consisting of healthy subjects. The operationalized aim of the study is then:

- To identify 60 patients with IBS as diagnosed by a physician in accordance with certain internationally approved criteria and
- To identify 60 non-IBS controls who will complete a patient questionnaire in order to eliminate the possibility of IBS.

Both groups will complete the NEO-PI-R (Costa & McCrae, 1990) and the Health Behaviour Checklist (Vickers et al., 1992) and statistical procedures will then be applied to ascertain differences between the two groups with regard to the two test batteries. Although the empirical aspect is quantitative, the results will be interpreted within the context of the holistic biopsychosocial model.
2.1 Chapter delineation

Chapter two forms the philosophical underpinnings of the study and outlines the re-conceptualization that has occurred in health and illness over the past few decades. This has a significant bearing on the rest of the study in that it not only provides insight into how psychosomatic illnesses such as IBS are viewed by medical and psychosocial specialists, but also suggests how such illness may be treated and managed in the present and future.

Chapters three and four form the theoretical foundations of the study together with the associated research findings. The former investigates the concept of functional illness, in particular the gastrointestinal disorders, and goes on to provide an overview of IBS from a biopsychosocial perspective. This includes a history of the syndrome, the diagnostic criteria and clinical presentation, epidemiology, proposed etiological dimensions as well as the management and treatment of the disorder. Chapter four provides an in-depth discussion of the concepts of personality, health and health behaviours, along with relevant empirical evidence, in an attempt to show the influence of psychosocial and behavioural correlates in psychosomatic illness.

Chapter five examines the empirical foundation of the study including a description of the methodology used, subjects, measuring instruments, hypotheses to be tested and methods of statistical analysis. Following this, the research findings are presented in chapter six, while chapter seven presents a discussion of the results, limitations of the present study and recommendations for further studies.
Chapter 2

Philosophical Foundation of the Study: Re-conceptualizing Health and Illness

Despite the tremendous advances of modern medicine in the last few decades, the Western world is experiencing a profound health crisis. Many reasons are given for the dissatisfaction of overall health-care, such as the lack of caring, overuse of drugs, and often excessive and inappropriate surgical and diagnostic procedures, but the overriding concern remains the imbalance between spiraling health costs and the effectiveness of modern medicine. Although the causes of the health-care crisis are multiple and complex, there is growing awareness both within and outside of the medical field that the shortcomings of the current health-care system are rooted in the underlying conceptual framework.

The crisis in health-care is essentially a crisis of perception and is thus inextricably linked to the much larger sociocultural crisis. The energy crisis, the rampant environmental pollution, the social problems of rising violence, crime and unemployment are all facets of the same crisis and possibly derive from the fact that the predominant world view in the west is no longer working. Cartesian–Newtonian science has provided a fragmented view of reality that recent scientific developments have shown to be inconsistent with the interconnectedness of the world. The realization that biological, psychological, social and environmental phenomena are all interdependent is fostering a more holistic vision of life across all fields of human activity, especially those areas concerned with health and healing.

This chapter explores what a worldview or conceptual framework means, and then examines the intellectual Zeitgeist in which the two predominant worldviews have evolved. This is followed by a brief discussion of the holistic perspective in support of the mind-body interaction and the associated implications for understanding the mind and the body, health, illness and health-care and for establishing a research orientation.
2.1 Perspectives on the nature of knowledge

Understanding the origins of the current health crisis requires moving to a meta level and examining the origins of the western world's patterns of thinking about reality. This section explores the concept of science as the predominant source of knowledge in the west, and considers how knowledge is both derived from, and in turn shaped by, worldviews. A brief discussion of the concepts of cultural revolutions and paradigm shifts shows how worldviews, knowledge and civilizations continually change and evolve over time.

2.1.1 Knowledge and science

The dictionary (Collins, 1978) refers to science as the organized body of knowledge that has been accumulated on a subject. Although this definition is consistent with the literal meaning of 'science' derived from the Latin scientia, meaning "to learn" or "to know", the more popular connotation of the word links it to the natural sciences and knowledge about nature. Western science has narrowed this definition even further so as to encompass only knowledge gained through a specific procedure, the scientific method (Shepard, 1992). Of the wide range of sciences or disciplines that exists, modern physics has had the most profound influence on almost all aspects of modern society and has become the basis of natural science. As Capra (1991) and Shepard (1992) indicate, the combination of natural and technical science has touched the lives of everyone on the planet in ways that are both beneficial and detrimental. However, as Capra (1991) suggests, the influence of modern physics extends beyond technology to the realm of thought and culture where it has transformed the way people think about the universe and their relation to it.

Despite the consensus amongst the scientific community that science is grounded in the scientific method as the acceptable procedure for generating and testing assumptions about the world, there is growing recognition in this postmodern era that science is in fact a social and cultural product and is hence relative to the context. The individual's interpretations and even perceptions of reality are conditioned by myriad factors such as language, culture in general, the dominant world view of the world, by personal (both conscious and unconscious) interests as well as by interests based on gender, race and social class. Knowledge is therefore not an absolute reflection of reality as it exits "out there", but instead represents people's attempts to discover and reflect reality as they perceive and interpret it (Capra, 1982; Madsen, 1987; Schaeff, 1992; Shepard, 1992).
In this regard, Wilbur (1996) proposes a spectrum of consciousness by which human beings have available to them a spectrum of different modes of knowing, each of which discloses a different type of world. The 'eye of flesh', the 'eye of mind' and the 'eye of spirit' produce empiricism, rationalism and mysticism respectively. By and large empirical-analytical science belongs to the eye of flesh, phenomenological philosophy and psychology the eye of mind, and religion and meditation to the eye of spirit or contemplation. When one eye tries to usurp the role of another, a category error occurs. So when religion tries to be scientific, philosophy and psychology try to be religious and when science tries to be philosophic, all are guilty of category errors. Wilbur (1996) suggests that what seems to have occurred in the past was that all three eyes of knowledge were reduced to the lowest and all modeled and collapsed onto the Newtonian eye of flesh. This is the realm of science, of rational knowledge and attempts to measure, quantify, classify and analyze. As it is easier to grasp one's representations of reality than to understand reality itself, the limitations of any knowledge obtained through rational empirical means is becoming increasingly apparent (Capra, 1982; Shepard, 1992; Wilbur, 1996).

One important aspect related to seeking a more balanced or holistic approach to science relates to the issues of values, ethics and responsibilities that are attached to knowledge. The common assumption that science is totally objective and hence neutral and value free, is contrary to the fact that throughout history science has been used to support certain political and economic views (Schaef, 1992). This is congruent with the postmodern stance towards knowledge making that reflects a broad shift away from an 'exogenic' perspective towards a more 'endogenic' perspective, or from a position of objectivity towards a position of constructivism. This shift from objectivity to constructivism represents the changing understanding of knowledge from something that people possess somewhere in their heads to something that people do together. The challenge has become one of grappling with a new conception of knowledge, where knowledge is seen as a process rather than a solid construct 'out there' to be grasped and discovered. Although many authors use the terms 'constructivism' and 'social constructionism' interchangeably, Kotze and Kotze (1997) maintain that they are different in that the latter shifts attention to the process of knowledge making between rather than within persons. Thus it is through social interaction with the family and wider society that many beliefs about the world are taught and learnt. This view contends that we socially construct reality through the shared and agreed meanings that are communicated in language and that these shared beliefs about the world are 'social inventions' rather than the 'personal
inventions’ of constructivism. Thus, this postmodern era presents a radically altered view of knowledge that is based on the recognition that our hypotheses about the world are not directly provable and that context and meaning are fundamental.

2.1.2 A conceptual framework for science
According to Madsen (1987) the concept of science has evolved from the more narrow understanding of only the empirical aspect to include the theoretical and philosophical dimensions. During the 19th century the word science was equivalent to empirical research or the descriptions of observations. After the First and Second World Wars, this definition broadened to include the theoretical and philosophical levels respectively. All scientific endeavors therefore include three levels of abstractions: the empirical, the theoretical and the philosophical (Madsen, 1987), which correspond to Wilbur’s (1996) eye of flesh, eye of mind and eye of spirit respectively.

The empirical level is the most fundamental level, the level of data, of the descriptions of observations, and of experimentation. Originally introduced by Francis Bacon in the 17th century, the inductive process, which involved recording available facts, devising experiments and then testing the conclusions by further experiments, initially characterized this level of inquiry. Descartes then added a deductive, rational and analytical dimension, which Newton then synthesized into the process now known as the scientific method (Madsen, 1987; Shepard, 1992).

According to Madsen (1987) the role of theoretical thinking is to produce theories, or sets of testable hypotheses along with explanatory models. The very nature of theory therefore lies in its explanation of observed phenomena. Although not absolutely static, models and theories are generally stable structures that are valid for a certain range of phenomena beyond which they no longer provide a satisfactory description of nature. When this occurs, existing models and theories have to be either extended or replaced. This is analogous to the process of scientific revolution described by Kuhn (1962), who maintains that when the anomaly becomes too great, it stimulates crisis in the field and leads to the destruction of old theories.

The philosophical dimension acts as a broad frame of reference which Kuhn (1962) calls a paradigm, Madsen (1987) the meta level and Bateson (1979) and Keeney (1983) an epistemology. Madsen (1987) regards this philosophical dimension or meta level as being composed of two parts, the philosophy of the world and the
The philosophy of science. The philosophy of the world comprises metaphysical world-hypotheses, which are distinct from scientific hypotheses in that they are not testable, but constitute the overall generic background for the theoretical and empirical levels. The philosophy of science includes metatheses about epistemological, metatheoretical and methodological problems. These metatheses tend to be formulated in prescriptive language such as rules, norms, or ideals that guide or direct theory formulation and empirical research (Madsen 1987).

These three stages are not clearly separated into absolute categories and do not necessarily occur in a set order, but instead form part of the ongoing process of the evolution of knowledge. Philosophy guides and influences theory which in turn guides and shapes empirical observations and experimentation. Changes on one level inevitably affect changes on other levels. However, as the most abstract and prescriptive level of thinking, the philosophical level is primary and functions to guide theoretical and empirical endeavors.

It is at the philosophical or meta level that the concept of epistemology or paradigms belongs, to be discussed in the next section.

2.1.3 Epistemology and paradigms
As part of Madsen's (1987) philosophy of the world category, epistemology is defined as the study or theory of the nature and grounds of knowledge (Collins, 1978). Auerswald (1985) describes it as “thinking about thinking”, as knowledge consists of information, and the abstract expression of knowledge in either spoken or written words is based on prior thought. Another, more concrete, but closely related use of the word is where it is preceded by a definite or indefinite article, such as “an epistemology” and “the epistemology”. When used in this way it generally refers to “a set of immanent rules used in thought by large groups of people to define reality” (Auerswald, 1985, p.1). The important point is that it is impossible not to have an epistemology (Keeney, 1983) or worldview, as these are conceptual grids or filters through which individuals view and interpret the world around them in order to provide meaning and coherence.

The concept of paradigm is part of Madsen’s (1987) ‘philosophy of science’ category and is used by Auerswald (1985) to denote a subset of rules that define a particular segment of reality. Kuhn (1962) refers to it as the collective set of attitudes, values, procedures and techniques that form the generally accepted perspective of a
particular discipline at a point in time. Both uses reflect the original Greek work *paradeigma*, meaning *pattern* (Capra 1982; Reber, 1985).

The traditional worldview of the west is variously known as the dualistic-materialistic, Cartesian-Newtonian, or as just the linear paradigm. It is atomistic, reductionistic and anti-contextual and follows an analytical logic concerned with combinations of discrete elements. In contrast, the new postmodern, holistic paradigm is nonlinear and emphasizes ecology, relationship, whole systems and the principles of quantum physics. As such, it is attuned to interrelation, pattern, complexity and context (Keeney, 1983).

This shift in world-views or paradigms is part of a broader transformation process that can be understood in the context of human cultural evolution.

**2.1.4 Cultural revolutions and paradigm shifts**

The history of humankind is characterized by the cyclical processes of genesis, growth, breakdown and disintegration of civilizations. This recurrent rhythm in cultural growth appears to be related to the processes of fluctuation that have been observed throughout the ages, and were always regarded as part of the fundamental dynamics of the universe. Ancient Chinese philosophy sees this ceaseless cyclical motion to be inherent in all life and generated by the dynamic interplay between the two polar forces of ‘yin’ and ‘yang’ (Capra, 1982).

The breakdown and disintegration of civilizations is commonly expressed as multiple crises or transitions that tend to overlap and affect both natural and social environments. Although these crises are characterized by loss of flexibility and disharmony, creative minorities usually carry the transformative process forward. Many thinkers concur that the current global crises are an indication that western civilization is currently undergoing breakdown and disintegration that is part of a broader cycle of cultural transformation. Capra (1982) identifies three major transitions that will have a profound impact on western civilization: the decline of patriarchy, the depletion of fossil fuels, and the shift in cultural values. This latter transition of cultural values is commonly called a *paradigm shift* and is associated with profound changes in the thoughts, perceptions and values that shape a particular vision of reality (Capra 1982).
The evolution of humanity is inextricably linked to the evolution of consciousness and knowledge, which in the west, has been characteristically one-sided in favour of the yang or masculine dimension (Capra, 1982). Whilst the spiral is a more appropriate analogy than the circle to describe such evolution, the symbol system of alchemy (Shepard, 1992) provides a useful analogy for the next step in the development of human consciousness and knowledge. According to Shepard (1992), this step goes beyond simply adding the feminine to science. The alchemical process involves the breaking down of present structures in order to allow the opposites to unite and integrate into something totally new at a metalevel. This is analogous to the process of scientific revolution described by Kuhn (1962) and the breakdown and disintegration of civilizations described by Toynbee (in Capra, 1982).

The anomalies that stimulate crises in both science and civilizations, lead to conflict and confusion which like in the first stage of the alchemical process, entails the breaking down of old forms and the interaction of opposites. Although characteristically a time of chaos, disorientation and depression, the darkness harbours creativity and the promise of endless possibilities where all seemingly opposed and contradictory realities are seen as part of the same reality. This represents the second stage of the alchemical process, the co-existence of a multiplicity of views. In the final stage, the opposites merge and fuse to create something new and superior to any of the original forms. The alchemical process of transformation is a continual process that gradually encompasses more and more of the opposites as it moves towards greater and greater wholeness. The incorporation of the lower levels into the meta levels eventually results in the creation of the gold or in Jungian terms the mandala, both representing the ultimate state of wholeness (Shepard, 1992).

The current global crises that are part of the wider cultural transformation are indicative that traditional ways of viewing reality are no longer viable. The shift from a linear to a nonlinear paradigm is in this sense, an unavoidable and welcome transformation that is ushering in a 'new age' characterized by ecological or holistic thinking. The origins of the Newtonian versus the holistic paradigms are traced in section 2.2, and the present state of the debate is discussed.
2.2 The linear versus holistic worldviews

The linear and holistic worldviews did not suddenly appear as single instantaneous creations but gradually evolved in response to changing intellectual climates. This section traces the unfolding of these two very different ways of conceptualizing reality.

2.2.1 The emergence of the Newtonian paradigm

The relationship between the mind and the body has long been controversial amongst philosophers, physiologists, psychologists and medical specialists. Are experiences purely mental, purely physical or an interaction of the mental and physical? The view that there are delicate interrelationships between the mind and the body dates back to ancient Greece. Hippocrates, the “father of medicine” rebelled against the idea of health as a function of the Gods and demons and proposed a humoral theory of illness. He maintained that the body contained four basic fluids or humors which when balanced reflected a state of health and when imbalanced, a state of illness or disease. Although his theory was later discredited, the four temperaments associated with these humors – cheerfulness, depression, hostility and apathy – remain the key ones for understanding personality and health today (Friedman, 1991; Sarafino, 1994).

However, the traditional view of the interrelationship between mind and body lost favour in the 17th century. With the advent of physical medicine during the Renaissance, the belief that the mind influences the body came to be regarded as unscientific. Understanding of the mind and soul was relegated to religion and philosophy, and that of the physical body to medicine. The 17th century philosopher and mathematician, Rene Descartes probably had the greatest influence on scientific thought of any philosopher in history. Credited with developing and popularizing the dualistic viewpoint, Descartes argued that the mind or soul was a separate entity parallel to and incapable of affecting physical matter or somatic processes in any direct way. This Cartesian dualism of mind and body became the predominant philosophical basis for medicine and greatly influenced scientific and medical developments and discoveries of the 18th and 19th centuries (Sarafino, 1994).

The giant of the scientific revolution was undoubtedly Isaac Newton who combined all the preceding philosophical and scientific developments into a new scientific theory about the functioning of the universe. The analogy of the universe as operating like a huge machine according to exact mathematical laws was the basis of
this theory. All phenomena followed definite laws with linear unidirectional causality, whilst atoms, the building blocks of all matter, were considered to be solid and indestructible. According to this worldview, the key to knowledge resided in empirical testing and analytical measurement of physical entities. The result of such thinking caused a separation of physics from metaphysics, science from religion and body from mind. This linear perspective paved the way for the emergence of what is still known as the biomedical model of disease which assumes that disease is an affliction of the body and is separate from the psychological and social processes of the mind (Capra, 1982; Gatchel & Blanchard, 1993; Sarafino, 1994).

2.2.2 The emergence of the holistic paradigm
During the mid 19th century this strict dualism mellowed as a result of the work of physicians such as Claude Bernard (1856-1878), one of the first prominent physicians to emphasize the role of psychological factors in physical illness. Subsequently Sigmund Freud (1856-1939) became influential in stressing the interaction of psychological and physical factors in various disorders. Although the emphasis in determining illness remained primarily on the role of the body, microorganisms and various biological factors, the medical profession gradually became aware of other significant influences. The concept of psychogenesis (i.e. the belief that psychological processes can affect bodily processes) was gradually revived (Gatchel, 1993).

The start of the 20th century then saw revolutionary scientific discoveries by physicists such as Planck and Einstein, which could not be explained by the classical Newtonian view. These new theories dramatically transformed previous conceptual assumptions about the nature and boundaries of physical reality and set the stage for a major paradigm shift throughout the disciplines (Capra, 1982).

A totally new way of thinking about the universe developed. New laws governing the study of matter, energy and their interactions were introduced, which in turn radically transformed concepts of space, time, matter and causality. The view of the universe broadened from the previous mechanistic analogy of a giant machine, to a view that regarded the universe as "an indivisible dynamic whole whose parts are essentially interrelated and can only be understood as patterns" (Capra, 1982, p.66). These fundamental particles were seen to possess a dual wave-particle nature, depending on their environments. Furthermore, matter did not appear to exist with certainty, but rather showed tendencies or probabilities to exist. No basic building blocks were
discovered in nature, but rather, complicated webs of relations between various parts of the whole. The focus on energy reflected the intrinsic dynamism of matter and moved from an understanding of world as substance, to one that emphasized process, event and relation and the mutual interaction of observer and observed (Bohm 1983; Capra, 1982; Shepard, 1992).

There were other valuable scientific developments that contributed towards this new way of thinking about reality. Smuts, introduced the term 'Holism', derived from the Greek *holos* or 'whole' to describe a unified view of man and nature that dated back to Hippocrates, and so revived the ancient concept of the mind and body as an indivisible whole (Weinberg & Van Wyk, 1994). The notion of *Homeostasis* or steady state was proposed by biologist Cannon, who showed how the emotions and stress could affect the physiology of the body through the fight-flight-fright mechanism. In addition, microbiologists started realizing that microorganisms in themselves did not necessarily 'cause' disease, but interacted with hosts of varying degrees of disease resistance to produce varying degrees of pathology (Gatchel, 1993; Keeney, 1983; Greenberg, 1992 in Levine & Fitzgerald, 1992).

The discovery of the holographic principles then reinforced this move back to holism and became an important part of the new scientific worldview leading to quantum physicist Bohm's (1983) proposal of an implicate order of reality to describe the hidden interconnectedness within the universe. Interesting parallels between physics and neurophysiology also emerged with Pibram's revolutionary holographic model of the human brain. The conceptual joining of the proposals of both Bohm and Pibram supported the new emerging model of the interconnectedness of the universe (Dossey 1982; Grof, 1992).

The science of cybernetics or feedback was also significant in helping to change traditional linear thinking. Although popularized by Weiner in 1947, its etymological roots indicate that the term was used as far back as the 14th century to signify both nautical and social control (Capra, 1982), suggesting that cybernetics was connected with people as well as their engineering devices. Within this intellectual climate, general systems theory took root, originally as biological theory as advanced by biologist Bertalanffy (1968). Although medicine utilized some of these ideas in terms of describing organ systems within the organism, medical science persisted in looking for specific 'causes' or 'etiologies'. Then, during the late 1970's, Prigogine's revolutionary theory of dissipative structures created a bridge between biological and
The theory of dissipative structures which proposed that not only could order arise out of chaos, but essentially, order could not arise without chaos, not only introduced parallels between the microscopic and macroscopic realms of the universe, but also provided an explanation for the evolution of more complex and sophisticated phenomena and further reinforced the oneness of humans and nature (Dossey, 1982; Gatchel & Blanchard, 1993; Keeney, 1983; Greenberg, 1992 in Levine & Fitzgerald, 1992).

Building on these scientific and philosophical developments, Gregory Bateson adapted the systemic principles and applied them to human communication and thought systems and so developed an alternative human science. By challenging traditional thinking and demonstrating that all boundaries in the world are illusory, Bateson revealed that mind and matter form an indivisible unity. Family therapy arose as an alternative to the traditional diagnostic therapeutic approaches. This heralded a movement towards a new systemic perspective within psychology and way of understanding the person that moved beyond the individual to include the systems in which the individual is embedded (Auerswald, 1985; Keeney, 1983).

2.2.3 The present state of the debate
One of the most striking recent philosophical insights is the realization that there is no absolute truth in science. Rather, the process of scientific discovery rests on limited and approximate descriptions, which are gradually revised and improved over time. Capra (1991) maintains that far from being an arbitrary process, the evolution of knowledge occurs in well-defined ways where prior knowledge is not invalidated but reformulated and enhanced through the improvement of approximations. Just as quantum mechanics has not shown Newtonian mechanics to be wrong, merely limited, so the insights and knowledge gained from quantum physics will not be invalidated by future research, only re-formulated (Capra, 1991). Thus, although the Cartesian-Newtonian and holistic paradigms are radically different thought systems, they need not necessarily be regarded as exclusive or incompatible, but instead as different punctuations of reality. At the higher meta level, the differences may be viewed as dialectical aspects of the process of knowledge about reality. As Keeney (1983) suggests, each perspective is richer if we keep both punctuations and realize that at the meta level they are connected to form necessary parts of the same whole. The linear and holistic are essentially cybernetic complementarities, as are yin and yang, mind and body, health and illness, where the one cannot exist without the other.
As mentioned earlier, it is now commonly accepted that the major problems of western society derive from adherence to outdated concepts and values. These include the notion of the universe as a mechanical system composed of elementary building blocks, the view of the human body as a machine, absolute and separate concepts of space and time, the view of life as a competitive struggle for existence, the belief in unlimited material progress through unchecked economic and technological expansion and the belief that mind is merely a by-product of matter. However, postmodern science has revealed the limitations of these assumptions and the urgent need for a more expansive worldview (Capra, 1991; Dossey 1982; Grof, 1990; Schaef, 1992; Shepard, 1992).

Although quantum physics has spearheaded the movement towards a new worldview, revision has and is taking place across the whole spectrum of disciplines, including society itself. Variously described as ecosystemic, ecological or holistic, this new paradigm regards the world as an integrated whole and "recognizes the fundamental interdependence of all phenomena and the embeddedness of individuals and societies in the cyclical processes of nature" (Capra, 1991, p. 358). The new paradigm has found its most appropriate expression in cybernetics and systems theory which offers a more comprehensive and unified view of reality, the cosmos and human nature (Capra, 1991; Grof, 1992).

On a practical level, this has significant implications for science in general and medical science in particular. There can be little doubt that the achievements of western science and biomedicine have provided remarkable knowledge about the universe and impressive tools for the improvement of the human condition. However, the splitting of mind and matter and the predominance of the yang mode of consciousness has led to imbalance and disharmony on all levels of existence. Whilst current notions of reality remain in transition between these two main paradigms or worldviews (Keeney, 1983), there is increasing awareness of the need for integration between the two, particularly in the areas of health care. As health is increasingly being understood to be a multidimensional phenomenon involving interdependent physical, psychological, social, spiritual and environmental dimensions, it seems appropriate that holistic methods of health care focus on all of these dimensions in order to provide a more balanced and integrated approach to health care (Auerswald, 1985; Dossey, 1982; Sheikh and Sheikh, 1989).
Given that the holistic paradigm is increasingly gaining acceptance based on evidence arising from a variety of areas within the natural sciences, the following section 2.3 outlines some of the links supporting the mind-body interaction.

### 2.2 The holistic paradigm in support of mind-body interaction

Although the idea that the interaction between mind and body is somehow linked to states of illness and health is an ancient one, it has more recently received support from a wide variety of natural sciences such as quantum physics, systems theory and psychoneuroimmunology.

Within the field of quantum physics, Einstein's proposition that matter and energy are equivalent and interchangeable, changed the Newtonian image of the world as being comprised of solid and static matter, into an image of an intrinsically dynamic and evolving universe. Bohr (Pelletier & Herzing, 1989) developed the complementarity principle, demonstrating the wave-particle nature of subatomic particles depending on experimental conditions. This same principle is receiving attention in the receptor research of the psychoneuroimmunology (PNI) realm where evidence suggests that all neuropeptides may be made up of one molecule and that changes in its configuration result in new information that differentiates neuropeptides from one another (Pert, 1997). This change in configuration is so instantaneous that researchers have speculated that the receptors have both a wave-like and particulate character. Although this modeling is highly speculative, it is indicative of the wealth of insight the holistic paradigm has derived from the natural sciences, and which lend insight into the increasingly subtle energy models of mind-body interaction (Pelletier & Herzing, 1989).

Heisenberg's uncertainty principle is another basic insight from quantum mechanics that also lends support to the mind-body interaction. The principle which describes the effect of the observer on changing a system through the very act of observation, and which is supported by Bohm's theory of implicate-explicate order, describes the futility of trying to separate the observer from the observed and the part from the whole. Quantum field theory later described a field for each type of particle and suggested that it is the interaction of these fields that make up reality and create a system of interaction. Viewing matter as a complex web of interconnections or sets of relationships reveals the necessity for observing and accounting for context and for the role of the observer in shaping the process of observation and altering whatever...
is observed. This essentially implies that understanding phenomena requires that they be understood within the relevant suprasystem or context in which they occur. In focusing solely on decontextualized individual monads, a linear approach fails to take account of the reciprocal interactions, which define whole systems (Capra, 1982; Keeney, 1983; Shepard, 1992).

Systems theory has also played a major role in the attempt to comprehend the interaction of the mind and the body. Bertalanffy (1968) introduced the notion that the whole is different and more than the sum of its parts. According to his theory, it is the flow of energy across boundaries and the aspects of higher levels of complexity and order emerging from open systems that are expanding and interacting with the environment that defines the whole. From this perspective, any system is also a segment of a larger system and contains smaller systems, which is particularly relevant when considering mind-body interactions and highlights the interconnectedness between all systems, both within and outside of the person. This interconnectedness between all levels of systems also reveals the arbitrariness of punctuating systems in various ways and differentiating between system levels such as cell, organ, individual, family, as well as the sociocultural and environmental milieus (Capra, 1982; Pelletier & Herzing, 1989; Zukav, 1979).

Still within the realm of systems theory, Prigogine and Stengers' (1984) theory of dissipative structures posits the formulation that living things are open systems and thrive above states of equilibrium that demand entropic prediction from the laws of thermodynamics. According to this theory, there is no hierarchical structure, but rather an interweaving of levels of complexity. Essentially living systems are able to exchange energy with the environment and therefore are stabilized by change and flow of information, thus avoiding entropy and the collapse of the system. Energy flow within the structure may cause perturbations or fluctuations, which if small are suppressed, but if great, may initiate drastic change to the structure. Although increasing complexity ironically gives rise to increasing fragility, it is this fragility that is paradoxically the key to growth. Structures that are insulated from disturbance are also protected from change. According to Prigogine and Stenger's (1984) theory there are parallels between the reality of the microscopic realms of the universe and the level of ordinary human experience where the components of a dissipative structure may act in a co-operative way to bring about a transformative restructuring of the whole. According to Dossey (1982), this is relevant to human health as it is only through perturbation or illness that people can escape to higher levels of
awareness and enhance their approaches to healthcare. Mild perturbations or intrusions such as the common cold are usually quite successfully dealt with by the body, whereas major illness has a far greater impact. Although these more serious perturbations usually demand greater resources and effort, they can be used in a positive way by initiating more complex restructuring of the physiology of the person. The practice of immunization is an excellent example of how a minor perturbation can disturb the body's immune system just enough to stimulate resistance to disease but not enough to succumb to it (Capra, 1982; Dossey, 1982).

Another promising approach to mind-body interaction is that of Pibram's (Dossey, 1984) notion that the brain works in the same way as a hologram. The relevance of the brain storing complete information and making this available to each of its "parts", means that humans potentially have access to all information through attention mechanisms or through neural inhibition. This in turn suggests that there is a higher level of control exerting its influence on the physical systems of the body.

A great deal of data explicating the relationship between the central nervous system (CNS) and the immune system has emerged in the field of psychoneuroimmunology (PNI). Numerous connections between the CNS and immune system (such as nerve endings in the thymus, lymph nodes, spleen and bone marrow) suggests the existence of a complex, communicative and interactive system between the brain and the immune system (Pelletier & Herzing, 1989). Noradrenergic sympathetic fibers also innervate the tonsils, appendix, and the Peyer's patches of the small intestine. Additionally, cells of the immune system respond to chemical signals of the CNS via neuroendocrines, neuropeptides, neurohormones and neurotransmitters. In this regard, the work of Pert (1997) and Pert et al. (1985) who have formulated systems theories of an informational nature to address the mind-body system, are especially pertinent. According to these authors, immune system cells are analogous to actors playing a role of reciprocal communication and exchange of information between the immune and central nervous system. This involves basic communication skills such as pattern recognition, message coding and decoding, and transmission abilities which are characteristic of these two systems. The involvement of higher cognitive levels suggests that there are principles and organizational rules governing these complex interactions. These principles have been labeled as supercedent properties and are characteristics of larger systems where the properties emerge from the interaction of the parts comprising the whole (Pelletier & Herzing, 1989). Given these complex connections and subtle interactions, the influence of
psychological and psychosocial factors may well determine the immunological consequences of exposure to a variety of invading stressors, psychological as well as physical.

The support of the natural sciences for the mind-body connection has in turn led to a wealth of research on mind-body relationships ranging from the effects of stress on ill health to trying to associate a particular disease with a certain emotional or behavioural pattern. Whilst some researchers have focused on bodily mechanisms that could serve to connect mental or emotional events to physiological processes, still others have gone so far as to teach people to use certain kinds of mental attitudes to alter specific physiological reactions such as blood pressure or immune response. The intention in all such mind-body investigations has been to show the expansive scope of the mind's involvement with the body and ultimately with health and disease (Dienstfrey, 1991; Pelletier & Herzing, 1989).

Given the increasing acceptance, acknowledgement and support of the mind-body connection, the following section 2.4 explores the implications of such a connection. Firstly, the re-conceptualizing of traditional notions of mind and body and the inevitable impact on understanding the phenomena of health and illness will be briefly discussed. Secondly, the implications that this in turn poses for caregivers in both medical and psychological fields for being able to deliver a meaningful and effective healthcare service will be examined. Lastly, the mind-body connection also has profound implications for research, which will be explored in the context of the research orientation of this particular mind-body study.

2.4 The implications of a holistic paradigm
The implications of a holistic paradigm will be discussed in terms of the body and the mind in section 2.4.1, health, illness and health care in section 2.4.2 and research orientation in section 2.4.3.

2.4.1 The body and the mind
As findings from numerous disciplines continually confirm the validity of the holistic perspective, the classical understanding of the body and the mind as being static, fixed and separate entities has begun to shift accordingly. Although the mind and body were previously relegated to the domains of psychology and medicine respectively, this has also begun changing, as interdisciplinary links have begun
Medical science has traditionally regarded the body largely as a mindless machine, whilst psychology has similarly seen mind as comprising only the brain and the production of rational thought. However, the view that mind is nothing more than the outcome of physiologic events in the body is being challenged by mounting evidence from a range of sources suggesting that conscious mental activity can and does exert change in the body and in the world at large. Recognizing this, means accepting that mind or consciousness becomes a legitimate factor in the unfolding of both health and disease (Dossey, 1982; Zohar, 1991).

In the same vein, the field of medicine is increasingly starting to embrace the notion that the human mind is not walled off from the supposed involuntary activities of the total autonomic nervous system. Rather, as research in this area has revealed, the brain is in fact an advanced apothecary with the primary functions of health maintenance and restoration. These findings undergird the basic concept of holistic health, which holds that the human being is a fully coherent and integrated life-support system with built-in mechanisms of balance and control. Thus the brain, as a vital body part, is being recognized not just as a biological switchboard, but as a center for total health management (Ornstein & Sobel, 1989; Pelletier, 1979).

As the attitude towards the brain has changed, both as a body part and as mind, so the attitude towards the body as a whole has also begun shifting. As recent psychoneuroimmunological research has demonstrated (Pert, 1997), far from being a collection of dumb organs, there exists a psychosomatic network comprising the nervous, immune and endocrine systems, which is mediated by emotion. Essentially body parts have their own wisdom and complexity that are inextricably connected to the whole of the body as is shown through the body’s ability to store the experience of depression, memories, awareness, images and specific sensations (Pert, 1997; Schaef, 1992).

The shift in perspectives is increasing awareness amongst the medical profession that the traditional ‘objective’ view of the body needs to be expanded to include the ‘subjective’ dimension. According to Braehler (1986), the individual’s personal experience of his or her own body, which is always a subjective experience, is still not taken seriously enough. Health and disease can therefore be approached on two
different planes, namely: the objective plane of organic, medically observable symptoms and the subjective plane of complaints and feelings of discomfort. Underlying these two approaches are two different systems of reference and two different languages, which become irreconcilable particularly when a patient either feels ill without an organic finding such as in the case of irritable bowel syndrome, or well in spite of a pathological one. Concentration on the objective at the expense of the subjective can have far reaching consequences and implies that patients may be in danger of being defined purely through their illness rather than being treated as a whole person. Creating a more person oriented medicine means paying attention to the person’s subjective or psychological states.

2.4.2 Health, illness and healthcare

The shift towards a more holistic paradigm has gradually led to a re-conceptualization of the phenomena of health and illness. This is congruent with the stance taken by the World Health Organization (WHO) and their definition of health as "a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity" (Sheikh & Sheikh, 1989, p. 29).

The multidimensional nature of health means that it is no longer the exclusive domain of biomedicine, but now unites a wide range of disciplines. The ecosystemic view of health is based on the notion of a dynamic balance and is consistent with the holistic approaches of many traditional cultures and various eastern traditions. Health from this perspective reflects an adaptive coherence or goodness of fit between parts of a system. Such congruence is, according to Jasnoski (1984), represented by high stability, diversity and richness, multiple pathways and the maximum conservation of energy. Dysfunctional behaviour is in turn understood to result from the system’s failure to co-ordinate and integrate various components. Thus, health and illness are not absolute states, which only exist in the absence of one another, but refer to types of functioning in the human ecosystem (O’Connor & Lubin, 1984).

The imbalance or disharmony characteristic of illness may arise either from a lack of integration within persons, or between persons and their environments. Disease is the manifestation of this imbalance and as such may occur at either the physiological, psychological, social or spiritual levels, or at a combination of these levels.
Given that health and illness are multidimensional phenomena, a holistic and integrated approach to healthcare seems most appropriate. A holistic approach to health care adopts a dynamic view that accepts the inherent ability of all living systems to restore their own balance once disturbed. This self-corrective ability has significant implications for self-healing and respects the need for persons to assume greater responsibility for their own health than has been the case in the past. Consequently, the traditional role of the all-powerful healer has shifted to include a more participatory stance. This broad shift encompasses moving away from methods of curing afflicted body parts, towards a greater consideration of the whole person, where the emphasis on remaining sensitive to the multiple influences affecting health and illness require a more interdisciplinary perspective (Dossey, 1982; Pelletier, 1979).

Essentially there exists a whole hierarchy or continuum of healing strategies. Those at one end emphasize the wholeness and interconnectedness of the universe and acknowledge the mind-body interconnections. Those at the other end of the continuum tend to focus more on effecting change at the physical level of the body in the sense of curing, rather than healing. However, what needs to be emphasized is that both have their place. As the holistic approach is the broader, more inclusive of the two, it incorporates the range of healing strategies and recognizes that different strategies are appropriate for different persons at different times depending on the needs of the individual (Scott & Dryden, 1996).

2.4.3 Research orientation
Despite myriad misperceptions over the word ‘research’, basic or pure research is essentially a method of problem solving that utilizes the principles of the scientific method. The scientific method is in turn based on a way of thinking known as inductive reasoning, which does not begin with a major premise but with an observation. In terms of Madsen’s model (1987), research encompasses all three levels of philosophy, theory and empiry to form a dynamic relationship geared towards generating knowledge. Although all research is motivated by a central problem or question, which is usually divided into more manageable subproblems, approaches to establishing the answers to these problems may be very different depending on the epistemological orientation (Leedy, 1989; Wassenaar, 1987).

At the level of epistemology, the evolution in thinking that has occurred clearly impacts on the research process. Using the philosopher Pepper’s four basic modes
of thinking about reality, Schwartz (1982) describes how the process of research has evolved over time from categorical (formistic) and cause-effect (mechanistic) models of thinking, through to relational (contextual) and interactive-systems (organistic) thinking. The first two stages characterize the linear, Newtonian paradigm, and the latter two, the holistic paradigm. What is of significance in this regard is that whilst only quantifiable concepts can be incorporated into the domain of Newtonian science, the holistic view based on quantum science, is able to embrace the qualitative as well as the quantitative aspects of reality.

Whilst the actual issue and process of integrating the quantitative and qualitative remains controversial, it appears that neither an exclusively linear research approach, nor an exclusively holistic approach can claim to be more effective or valid. Rather, as reductionistic and holistic approaches to research are not mutually exclusive, but instead complementary, an ideal solution would be one that embraces both. As the holistic paradigm is the broader more inclusive paradigm, which both contains and transcends the mechanistic, this would be the paradigm offering the greatest flexibility for studies focusing on the mind-body interaction. Although the empirical aspect of the present mind-body study on irritable bowel syndrome is quantitative, it is couched in the wider holistic model and hence incorporates holistic interpretations.

2.5 Chapter summary and conclusion

The move away from the linear towards more holistic paradigms heralds one of the most significant milestones of this postmodern era. Although this change in conceptualization has vast implications for human society as a whole, it is particularly relevant in the health care arena where it is transforming our understandings not only of the very concepts of health and illness, but also of the roles of both individuals and healers in the healing process itself. Although paradigm shifts typically occur within a context of crisis and are fraught with uncertainty and confusion, they are also tremendously exciting times that contain untold opportunities for exploration and growth. The present move towards holism and the increasing acceptance of the interdependence of the physical, psychological, social and environmental dimensions is a welcome response to the cry for a more balanced and unified view of reality. It represents an attempt to synthesize and transcend the extremes that have dominated and fragmented western society, particularly the split between mind and body. Essentially, the embracing of holism does not oppose but rather encompasses and transcends the traditional linear paradigm in ways that are mutually beneficial.
As the most fundamental level of the knowledge generating process, philosophical issues influence the types of problems formulated, the research designs and methodologies adopted, as well as the theories and models generated to guide, explain and interpret findings. Chapter three explores some of the theories and models emanating from the holistic paradigm with regard to the psychosomatic illness of irritable bowel syndrome (IBS), health behaviours and personality.
CHAPTER 3

Theoretical Foundations of the Study: A Biopsychosocial Approach to Irritable Bowel Syndrome

The previous chapter laid the philosophical foundations of this study on irritable bowel syndrome (IBS), health behaviour and personality, which according to Madsen's (1987) model, is the highest level of abstraction, comprising all scientific endeavors. Still working within Madsen's (1987) scheme, chapter three addresses the next levels of abstraction, specifically the theoretical and empirical bases of irritable bowel syndrome (IBS), whilst chapter four examines the theoretical and empirical bases of personality and health. Chapter three begins by clarifying what is meant by theory itself, and then continues with an explanation of the biopsychosocial model that forms the metatheoretical framework of this study. Certain relevant theoretical orientations and the associated empirical findings regarding IBS are then discussed within the context of this framework.

3.1 Systems theory as a conceptual bridge

Leedy (1989) points out that theories are always mental constructions or imperfect renderings of reality, which are supported by more or less evidence. They are systematic ways of organizing and explaining observations that include a set of propositions or statements about the relations among the various phenomena. Alternatively, the concept of metatheory refers to a broad overarching theoretical framework that encompasses various separate theories and models that are linked to one another systematically.

The general paradigm shift towards holism has not only created a new interdisciplinary milieu, but also stimulated awareness that the phenomena of health and illness are inherently complex and multidimensional in nature. It is against this broad scientific backdrop that biopsychosocial approaches to understanding human functioning are being formulated by a diverse range of researchers and clinicians seeking a common language. As a metatheoretical framework, ecosystemic theory has the potential to provide this conceptual bridge and to allow for the integration of biological, psychological and social approaches to understanding health and illness. This study draws heavily on this ecosystemic metatheoretical framework in order to
explore any possible links between irritable bowel syndrome, personality and health behaviours. The biopsychosocial model, which is a specific application of ecosystemic metatheory, is used in this study to conceptualize human functioning, and will be discussed in the following section 3.1.1.

3.1.1 The biopsychosocial model
The biopsychosocial model was first proposed by Engel (1977), as an attempt to integrate both person and their disorder and develop a unified concept of health and disease. His initial model has subsequently evolved and been elaborated on by a host of interpreters. The model is based on a systems approach that assumes that biological, psychosocial and environmental influences comprise a complex system of interactions shaping a person's health, vulnerability and reactions to disease. The basic premise of the model is holistic in its assumption that disease does not restrict itself neatly into one organ, but always affects the organism as a whole (Davidson & Strauss, 1995; Temoshok, 1990).

Although the biopsychosocial model has not delivered on its initial aim of bringing about a new era of theoretical and clinical integration, it is nevertheless accepted as essential for an adequate understanding of all illness. According to Davidson and Strauss (1995, p. 49), the failure to achieve this goal of integration may in part be attributed to the fragmentation suggested in the very name of the model 'with its implicitly hyphenated pieces'. They propose a life-context model that focuses on the whole life of the person and hence, not only furthers the conceptual advances inherent in Engel's (1977) biopsychosocial model, but also 'promises to bridge the longstanding gap between clinical practice and empirical research' (Davidson & Strauss, 1995, p.44). These authors seek to integrate the person and their dysfunction by including their functional side, or their strengths and competencies, over and above their dysfunctional side. Whilst many models focus purely on the illness or pathology side of the coin, these authors attend to the functioning and competencies inherent in all persons as an equally important flip side of health. Their model consequently displays a salutogenic bias (Strumpfer, 1990), in that it focuses more specifically on health and the origins of health than on pathology and the causes of pathology.

Temoshok (1990) regards the biopsychosocial model as more of a change in perspective, attitude and emphasis than a well-articulated theory. However, the controversy over the advantages and disadvantages of considering psychosocial
variables as possible mediators of disease onset or progression is waning with the emergence of substantial psychoimmunological research supporting the validity of the biopsychosocial model of disease. The biopsychosocial approach to understanding health and illness is essentially an evolving approach that is continually changing and being adapted in line with new conceptual developments. Although the validity of the name 'biopsychosocial' may be in dispute (Davidson & Strauss, 1995; Jasnoski & Schwartz, 1985), it will be used in the context of this study to denote a holistic or ecosystemic inter-disciplinary framework for understanding human functioning.

The following Section 3.1.2 explores the semantics of the field in attempting to delineate exactly what is meant by psychosomatic problems.

3.1.2 Clarification of concepts

Much of the semantic confusion derives from the fact that certain terms have been used to mean different things depending on who was using them and in what context. The field of psychosomatics or behavioural medicine forms the broader context of the study of functional disorders. The terms 'somatization' and 'functional' are used interchangeably to refer to specific disorders like irritable bowel syndrome.

3.1.2.1 From psychosomatics to behavioural medicine

Despite growing dissatisfaction over the controversy and ambiguity generated by the word 'psychosomatic', it remains deeply entrenched in the literature and hence requires clarification. Furthermore, as the functional gastrointestinal disorders are commonly described as 'psychosomatic', it is important to distinguish between 'psychosomatic' as an approach, and 'psychosomatic' as a specific class of disorders. Although the DSM-IV has now abandoned the actual category 'psychosomatic disorders' and replaced it with 'psychological factors affecting medical condition', the concept of psychosomatic as a class of specific disorders is nevertheless retained. The DSM-IV also includes the category of Somatoform Disorders which is comprised of eight conditions, one of which is Hypochondriasis, which is the preoccupation with the fear of having, or belief that one has, a serious disease based on the individual misinterpreting his or her physical symptoms or functions.

Lipowski (1986), regards the notion of psychosomatic disorder as a category of somatic illness to be a misleading and scientifically sterile one, because it tends to
perpetuate the obsolete notion of psychogenesis, the belief that certain physical disorders are caused by purely psychological phenomena, which is incompatible with the new doctrine of multicausality. The general consensus amongst writers in the field seems to be that 'psychosomatic disorder' as a separate category of somatic illness is redundant, and that instead, the term 'psychosomatic' only be used to refer to a general holistic approach to understanding illness (Engel, 1980; Kellner, 1994; Lipowski, 1986; Weiss, 1974).

Psychosomatics or psychosomatic medicine first appeared as an organized scientific discipline in the early 1930's as a reaction against the mechanistic view of man and medicine. Although closely linked with the psychoanalytic theories, Lipowski (1986) argues that it is fallacious to identify the field of psychosomatics with any particular theoretical orientation. Rather, psychosomatics has always embodied the ancient concept of holism, which has merely changed expression and evolved in response to the changing intellectual Zeitgeist. As such, psychosomatics is starting to adopt a more systemic, biopsychosocial theoretical orientation and is currently regarded to be an integrative science concerned with the study of mind-body-environment interrelationships (Lipowski, 1986; Weiss, 1974).

The field of behavioural medicine emerged during the 1970's as part of the broad trend towards synthesis within the scientific community. Although it appears to have similar aims to psychosomatics or in fact be another label to describe the same endeavours, Schwartz (1982) believes that the evolution of behavioural medicine goes beyond semantics to reflect an important change in conceptualization, making it a developmentally more mature field. The application of systems theory and thinking to psychosomatics reflects the overall shift towards holism and represents a development in thinking away from causal, mechanistic approaches towards more contextual and organistic modes of thought which includes the application of systems theory and thinking to psychosomatics (Schwartz & Weiss, 1978).

Psychosomatics has thus become subsumed under the broader field of behavioural medicine, which is primarily concerned with fostering a multidisciplinary approach in understanding issues of mutual concern in health and illness, rather than only disease. The discipline focuses on all aspects of illness from prevention and diagnosis through to treatment and rehabilitation, and relies on the integration of biomedical and behavioural knowledge and techniques in the pursuit of common goals. Consequently, it has significant implications for all aspects of theory, research
3.1.2.2 Functional disorders and somatization

There are various terms that have been used to describe symptoms or syndromes that have no clear organic basis. These include: 'medically unexplained symptoms', 'functional somatic symptoms' and 'somatization symptoms'.

Although the term 'somatization' has a long and complex history, it is now understood to be the process whereby people with psychosocial and emotional distress articulate their problems primarily through physical symptoms. Mayou (1993) maintains that these problems of terminology have been perpetuated and even exacerbated by the creation of the category of somatoform disorders in the DSM-IV. As this author points out, the subcategories have names derived from long established but highly unsatisfactory terms such as conversion disorder, hypochondriasis and somatization disorder. Mayou (1993) suggests that it is also unfortunate that the use of the category of somatoform disorders has confused many of those who do not understand that it is but one of the correlates of unexplained medical symptoms.

Kirmayer and Robbins (1991) refer to three different types of somatization:
- Somatization as medically unexplained somatic symptoms
- Somatization as worry akin to hypochondriasis, as in those people who worry about the possibility that they may have a serious disease or be vulnerable to one (despite medical reassurance to the contrary); and
- Somatization as the somatic presentation of psychological disorder.

Sanders (1996) points out that these three types of somatization vary in the extent of somatic symptoms, the extent of anxiety about perceived or actual symptoms and the extent of the psychological disorder. Furthermore, recent studies indicate that far from being atypical, somatization is the most common way for psychiatric disorders to present. Somatizing patients do not lack psychological symptoms, but they are mainly or entirely concerned with their physical complaints and so less likely to report their psychological symptoms. This is supported by medical anthropologists who maintain that somatization may be seen to operate cross-culturally as a socially adaptive strategy for dealing with potentially unacceptable or unwanted feelings, whilst avoiding the stigma of mental illness (Murphy, 1989). Thus, whereas psychosomatic theory is concerned with disease causation, somatization focuses attention on the experience and expression of illness. As such, somatization may be
understood as a variation in illness behavior and help-seeking (Kirmayer & Robbins, 1991; Lipowski, 1986; Murphy, 1989; Sanders, 1996).

The term 'functional' is an umbrella term for any disorder for which there is no known organic pathology (Reber, 1985). It implies a disturbance of physiological function rather than anatomical structure and tends to carry a psychogenic connotation. As stress and psychological conflict are believed to play a role in functional symptoms, they may be regarded as somatized expressions of psychosocial problems. Although the distinction between functional and organic is rooted in the dualistic ontology of biomedicine and the belief that some diseases are more real than others, the difference from a systemic perspective is seen as one between levels of process and structure. As such, functional disorders may involve abnormal processes occurring in structurally intact organ systems (Kirmayer & Robbins, 1991).

Somatization in its various expressions is an extremely common problem in all areas of medicine. It is also a major public health problem in that functional symptoms account for a high proportion of work absenteeism and social disability. In addition, those suffering from recurrent unexplained symptoms are often subject to extensive hospitalization and unnecessary, invasive and costly diagnostic and surgical procedures that can in turn generate serious iatrogenic disease (Drossman et al., 1994; Kellner, 1994; Kirmayer & Robbins, 1991; Lipowski, 1986). In this regard, studies from several western countries indicate that one in every four persons are afflicted with one or more gastrointestinal symptoms and that the functional gastrointestinal disorders account for approximately half of all referrals to gastroenterologists in the developed world. Of these referrals, irritable bowel syndrome is the most common, comprising one fifth to one half of all referrals (Drossman et al., 1994).

In line with a more holistic approach to understanding irritable bowel syndrome, the following section 3.2 uses a biopsychosocial framework to examine both the physiological and psychosocial concomitants of this disorder together with the associated recent empirical findings in each dimension.
3.2 A biopsychosocial approach to understanding irritable bowel syndrome

Between 30 to 80% of persons seeking health-care in the western world have symptoms that cannot be clearly medically diagnosed or explained (Sanders, 1996). The functional gastrointestinal disorders fall into this category and because of their high incidence combined with insufficient knowledge about etiology and ineffective treatment modalities, are the source of enormous frustration for both doctors and patients alike. Although there have been many attempts in both the psychological and medical literature to categorize and define medically unexplained physical symptoms, the variation in use of words like 'psychosomatic', 'somatization', 'functional', 'hypochondriac' and 'psychogenic' continues to generate confusion and misunderstanding.

3.2.1 IBS as a syndrome: definition and diagnosis

Over and above the development of more sophisticated technology and investigative techniques, the change in conceptual framework has had a profound impact on the understanding and management of the functional gastrointestinal (GI) disorders. In fact, as Drossman et al. (1994) point out, thirty five years ago when they first started practicing gastroenterology there were no clear definitions of these functional disorders, nor any uniform agreement that they in fact existed. However, there is still controversy regarding definition, pathophysiology and treatment of the functional GI disorders and the fact that they lack any known anatomical or biochemical basis means that they require classification in terms of symptoms only. Although the biomedical model has increasingly come to regard disease only in terms of lesions or deranged biophysical structures, genes and molecules, Kendall (1975) indicates that most ancient schools of medicine looked to signs and symptoms as diseases themselves. As such, the ancient idea of disease as a syndrome has once again gained validity with the move towards holism.

An essential part of clinical assessment and diagnosis involves the recognition of signs and symptoms, which act not only to provide a common language, but also to facilitate accurate diagnoses, effective interventions and reliable prognoses. Signs are the objective findings observed by the clinician, whilst symptoms refer to the patient's subjective experiences. A syndrome is a group of signs and symptoms that co-vary (Kaplan et al., 1994; Walker et al., 1990). In this regard, the work of Manning and colleagues (1978) has been seminal in generating a list of cardinal clinical features associated with the diagnosis of the functional GI disorders and has
considerably enhanced diagnostic skill through shaping a positive diagnosis in terms of symptoms, rather than by exclusion alone. However, the 'Manning criteria' have subsequently been revised and built on by Drossman et al. (1994) in the form of the 'Rome criteria'. These criteria mark the results of an extensive seven year effort by thirty internationally recognized investigators in the field who have assembled a comprehensive evaluation of symptom groupings ranging the whole GI tract from the esophagus to the rectum. The six symptom groupings include esophageal disorders (A); gastroduodenal disorders (B); bowel disorders (C); functional abdominal pain (D); biliary disorders (E) and the anorectal disorders (F). This study focuses on irritable bowel disorder which is commonly regarded as the prototypical functional bowel disorder (Kettell et al., 1992; Drossman et al., 1994).

According to the Rome criteria (Drossman et al., 1994, p.117):

The functional gastrointestinal (GI) disorders are defined as a “variable combination of chronic or recurrent gastrointestinal symptoms not explained by structural or biochemical abnormalities. They include symptoms attributed to the oropharynx, esophagus, stomach, biliary tree, small and large intestine or anorectum.”

“A functional bowel disorder is a functional gastrointestinal disorder with symptoms attributable to the mid or lower gastrointestinal tract. The symptoms include abdominal pain, bloating or distension, and various symptoms of disordered defecation.”

The irritable bowel syndrome is the most common functional bowel disorder “attributed to the intestines and associated with symptoms of pain and disturbed defecation and/or symptoms of bloatedness and distension.”

Drossman et al’s. (1994) rationale for classifying the functional GI disorders into symptom-based subgroups is based on four factors: site-specific differences, epidemiological data, statistical analysis and the need for diagnostic standards in clinical care and research. These authors point out that the symptom sets are not absolute, but open to interpretation and should ideally be regarded as a framework or starting point for assessment and research. Another important aspect is the evolving nature of the symptom groupings and the fact that they will inevitably be revised over time and in accordance with new information. In addition, the high prevalence of these disorders means they are likely to co-exist with other diseases, both
gastrointestinal (such as Chrohn's disease or colon cancer) and in adjacent organ systems such as the genito-urinary system and lower spine. All possibilities clearly need to be excluded before deciding on a diagnosis of IBS. Furthermore, the transient nature of these disorders means that they should be present for at least three months in order to be classified as a functional GI disorder (Drossman et al., 1994).

3.2.2 Classic symptomatology of IBS
The various classic symptoms of IBS, abdominal pain, distension, diarrhea and constipation will be briefly reviewed in the following section.

3.2.2.1 Abdominal pain
The majority of IBS sufferers experience abdominal pain, which is usually described as dull or colicky in nature and most commonly located in the left or right iliac fossa. However, pain may also radiate widely to the left scapular area, into the lower back and perineum, and even down the thighs (Burns, 1990; Dancy & Backhouse, 1993; Schuster, 1983). Weber et al. (1992) note that pain is typically intermittent but can be continuous with superimposed crampy symptoms. Prior (1995) reports that although a bowel movement or passage of flatus provides some pain relief in about half of patients with IBS, occasionally these actions can exacerbate the pain. In some patients eating was found to immediately precipitate pain or lead to pain several hours later. Those who have pain tend not to be bothered by it during the night, as is typical of most functional disorders (Steinhart, 1992). Furthermore, as the pain can vary greatly in intensity and location, IBS sufferers are prone to having abdominal operations, which are often inappropriate, painful and expensive and can also lead to other complications. These include appendectomy, hysterectomy, removal of ovarian cysts and operations for adhesions and adhesive obstructions (Burns, 1990). The tendency to have multiple abdominal operations seems to be a distinguishing feature of the clinical presentation in IBS females and appears to be particularly common in white South African IBS female sufferers (Burns, 1990).

3.2.2.2. Distension and gas
In the past, many cases of irritable bowel syndrome were believed to be the result of excessive air swallowing (aerophagia). However, Steinhart (1992) points out that these people do not appear to have any more air or gas in the bowel than people without the disorder; their symptoms are caused in large part, by the fact that the bowel is handling the air or gas in an abnormal fashion secondary to a motility
disturbance. Although not always apparent on clinical examination or x-ray, complaints of abdominal distension are common in up to 90% of IBS patients. The distension, frequently accompanied by belching and flatulence, is commonly described as a swelling of the lower abdomen which tends to become increasingly uncomfortable as the day progresses and may become sufficiently severe as to necessitate the loosening or changing of clothing (Prior, 1995; Weber et al., 1992).

3.2.2.3 Bowel disturbance

IBS characteristically involves a disturbance in stool frequency, form or passage which should occur at least 25% of the time (Drossman, 1983). Schuster (1983) reports that changes in bowel habits typically begin in adolescence or early adulthood with some patients reporting lifelong bowel irregularity. This irregularity may take the form of either constipation, diarrhea or of both conditions sporadically. The stool condition may be abnormal continuously or there may be periods during which bowel function is temporarily normal. Although mucus may be present in the stool, rectal bleeding is never attributable to IBS. The stool consistency varies from small, fragmented or tapered stools to soft, mushy stools to loose, watery stools (Burns, 1990). The predominance of diarrhea is characterized not by an abnormally high volume of stool but rather by the frequent urge to defecate along with possible minor incontinence. Stools may be loose, formed or pellet like and in all cases the urgent need to defecate is particularly common on rising and after breakfast. It is unusual for diarrhea to persist throughout the day. Thompson and Hawkey (1995) report that constipation is found more frequently in females, presenting either as infrequent defecation or as the need to strain in order to defecate. The sensation of incomplete evacuation is also common, resulting in many unproductive visits to the toilet or what Burns (1990) describes as ‘rectal dissatisfaction’.

3.2.3. Other symptomaticology

According to Crouch (1988), most patients with IBS symptoms have multiple other complaints that they more often volunteer or affirm than healthy controls. The diffuseness of abdominal symptoms and the experimental reproduction of pain all along the alimentary canal suggest that IBS is characterized by widespread gastrointestinal involvement and is not just a problem with colon function. These include upper gastrointestinal symptoms as well as symptoms unrelated to the gastrointestinal system.
Upper gastrointestinal symptoms include gastroesophageal reflux, heartburn nausea, early satiety and dyspepsia. Although difficulty in swallowing may be experienced, actual vomiting as part of the IBS is rare. There may be slight loss of weight due to IBS but if this becomes significant it is essential that other causative factors such as anorexia nervosa or organic disease be investigated (Andrews, 1994; Burns, 1990).

Gynecological problems such as dyspareunia with urinary frequency and urgency are common in women with IBS and hence many referrals tend to be gynecological rather than gastroenterological. Prior (1995) indicates that although around half of the women with pain who are referred to gynecologists have symptoms suggestive of IBS, less than 10% of these are found to have gynecological problems. In addition, the symptom overlap between IBS and some gynecological pathology such as endometriosis and pelvic inflammatory disease commonly leads to diagnostic confusion. The presence of back pain and referred colonic pain to the thigh often suggests orthopedic or neurological conditions. Additional features of IBS include dysphagia, fatigue, non-cardiac chest pain, bad breath or an unpleasant taste in the mouth, headaches, insomnia and palpitations (Burns, 1990; Crouch, 1988; Dancy & Backhouse, 1993).

According to Crouch (1988), the existence of this plethora of symptoms from other body symptoms further complicates the picture, and is suggestive that IBS may be an unfortunate nomenclature that focuses attention inappropriately on only one narrow component of a broader clinical phenomenon, hence his claim that IBS is a disorder with an “identity crisis.”

3.2.4 Epidemiology
Although the functional GI disorders are extremely common in adult westerners, their high occurrence in certain eastern countries such as China and Japan, suggests that this is a disease of developed countries rather than the west per se. Studies from several western countries indicate that between 15% to 20% of the general population suffer from IBS (Drossman & Thompson, 1992). In this regard, relevant research (Farthing, 1995; Latimer, 1983; Manning et al., 1978) shows IBS to be the most frequent condition encountered by gastroenterologists in developed countries, comprising around one fifth to one half of all referrals. IBS is also common in South America and the Indian subcontinent, although it is rarely diagnosed in Uganda. It appears common in black South Africans from the cities, and unusual in the rural
areas. Hence it seems likely that IBS is linked to factors like diet and stress which are more likely to be extreme in cities (Drossman et al., 1994; Olubuyide et al., 1995).

An exact prevalence in the general population is difficult to determine due to the intermittent nature of the symptoms and the absence of any clear physical and pathologic abnormalities. It appears that in western countries women are more likely to report and seek treatment for more functional GI symptoms, as are younger persons. In India and Sri Lanka where men seek medical care more frequently than women this picture is reversed and females represent only 20 to 30% of IBS patients. According to Drossman et al. (1994), although the functional GI disorders seem to afflict the lower income households with the lower the income the greater the symptom reporting, it nevertheless appears that persons who are full or part time employed are more likely to experience functional GI disorders than the unemployed (Drossman et al., 1994).

IBS often begins in late adolescence and may continue intermittently throughout life where the profile may be chronic or acute, or a mixture of both. About two thirds of patients who have been followed for periods of twenty years or longer continue to have symptoms and in rare instances, symptoms are almost constant. As with many functional disorders, a flare-up may occur shortly after rather than during a stressful period. However, although IBS is classified as a chronic or long-term condition and can cause enormous discomfort and varying degrees of disability, there is no evidence that it predisposes the person to other diseases or is life-threatening (Prior, 1995; Steinhart, 1992).

State costs, which may be high in terms of medical care, tend to vary greatly between countries. The number of consultations, technical examinations and unnecessary operations performed on IBS patients together with the cost of health care, will vary according to the healthcare system in each country. Important determinants may include the registration of patients with general practitioners, the access of general practitioners to various investigations, the number of health care providers and the availability of free health care or health insurance (Coremans et al., 1995). Although registration with a general practitioner may reduce patient referral to a specialist in some cases, as in United Kingdom and the Netherlands, consultation and referral rates for IBS may nevertheless vary between practitioners.
Further complications associated with IBS include the increased risk of unnecessary operations (Keeling & Fielding, 1975 in Langeluddecke, 1985), the generation of anxiety by repeated visits to medical personnel and associated investigations (Bachrach, 1980 in Langeluddecke, 1985) and absenteeism from work (Els et al., 1995; Whitehead et al., 1988). With respect to the latter, Els et al. (1995) emphasize that the morbidity of IBS is responsible for work absenteeism second only to the common cold. Economic effects also tend to vary between countries, and whilst IBS is not accepted as a cause for incapacity in Germany and Italy (unless a psychiatrist decides so), it is accepted as reason for permanent physical incapacity in the Netherlands, Belgium and France (Coremans et al., 1995).

Given the prevalence and epidemiology of IBS and other functional GI disorders, the role of assessment from a biopsychosocial perspective will be discussed in the next section 3.2.5.

3.2.5 Assessment of IBS

The biopsychosocial approach has attempted to counteract the reductionism of the biomedical model by focusing on whole-person care as opposed to isolated parts of the person. According to Engel (1977), the concentration on the biological to the exclusion of other dimensions has not only distorted perspectives of illness but also substantially undermined patient care. The influence of the conceptual framework is evident throughout the whole assessment and intervention process. Whilst the biomedical model remains a valid approach in its own right, it is nevertheless a limited view that forms only a part of the broader more holistic biopsychosocial perspective on understanding and treating illness. In this respect, proponents of the biopsychosocial approach argue that it provides a suitable framework within which both organized wholes and component parts can be studied, together with the relationship or goodness of fit between these parts.

The system level of intervention for the clinician is always the person. Assessment and intervention from the biopsychosocial perspective involves the entire ecosystem of the person's life. This includes both the subsystems comprising the person as well as the wider systems of which the person forms a component. The value of such an inclusive framework is that it acts to guide the clinician in his or her collection and interpretation of data to consider all the information in terms of the various system levels and their interrelationships (Davidson & Strauss, 1995; Engel, 1977; Jasnoski, 1984; Jasnoski & Schwartz, 1985; Schwartz, 1982).
The biopsychosocial approach requires that the basic professional knowledge and skills of clinicians span all the relevant biological, psychosocial and environmental dimensions, so that whatever problems are presented, a basic understanding, suitable course of action or appropriate referral can be recommended.

### 3.2.5.1 Biological assessment of IBS

There is a common agreement (Drossman et al., 1994; Coremans et al., 1995) that diagnosing IBS entails a mixed diagnostic approach, based on a symptom score and the limited exclusion of structural and biochemical abnormalities. A physical examination is not only necessary to screen for other diseases but also provides an essential foundation for patient reassurance. However, substantial controversy persists over the form that the physical examination should take. Lennard-Jones (1983) warns against the tendency to over-investigate and suggests that tests be chosen judiciously for each individual in order to strike a balance between positive clinical features and normal test results. Essentially all tests performed on the patient should be of such good quality that repetitions are avoided. In most patients one or more structural examinations by radiology, endoscopy or biopsy are indicated. Lactose intolerance or other types of malabsorption should be considered, as well as infection or infestation of the GI tract. Biochemical and hematological screening tests may be necessary in some instances to draw attention to important systemic disorders. It therefore appears that a diagnostic strategy adapted to the individual patient and his or her symptom complex appears to be the most rewarding, as in the final event, diagnosis is ultimately based on probability and on the elimination of organic disease mimicking the IBS (Camilleri & Prather, 1992; Coremans et al., 1995; Drossman et al., 1994; Lennard-Jones, 1983).

Accordingly, Drossman et al. (1994) emphasize that careful interpretation of the pain and stool characteristics is one of the most important steps in recognizing the IBS. These authors point out that pain related to defecation is likely to be bowel pain, whereas pain associated with exercise, movement, urination or menstruation may have a different cause. Although the signs or objective findings are important, especially in IBS, they reflect a necessary but not sufficient condition for the experience of illness. It is therefore vital that clinicians include the patient's subjective experiences of their illness together with reported and observed behaviour. This entails encouraging symptom reporting within the whole context of the person's life,
noting activities, reactions, feelings and behaviour as symptoms have evolved, as well as the life circumstances both prior to and at the time of onset (Engel, 1980).

3.2.5.2 Psychosocial assessment of IBS

Engel (1977) maintains that one of the most essential skills of the physician involves the ability to elicit accurately and then analyze correctly the person's verbal account of the illness experience. Part of this entails high level interviewing skills together with a basic understanding of the psychological, social and cultural determinants of how patients communicate symptoms of disease. Engel (1980) differentiates between the constructs psychosocial and psychiatric and points out that confusion between the two is essentially a category error. Psychosocial refers to the high levels of organization in the natural hierarchy of systems, whereas psychiatric refers to the field of knowledge, the skills and the practices of physicians whose special competence are the recognition, understanding and treatment of those with mental and emotional disturbances. Psychosocial is an abstract concept referring to ways of conceptualizing and thinking about natural phenomena. Psychiatric is a concrete term referring to specific medical practices. By denying the applicability of the scientific method to the psychosocial, the biomedical model has helped create the illusion that psychiatric and psychosocial are the same thing. However, the biopsychosocial model eliminates this false dichotomy and renders it clear that psychosocial is germane to all of medicine and all clinicians. The American Board of Internal Medicine now recognizes interviewing as a psychosocial skill essential for clinical competence. Although the psychosocial skills and knowledge will range according to the role of the clinician, what is apparent is that there now exists a common core of psychosocial knowledge and skills required for the clinical competence of every clinician.

According to Devroede (1989) an important and rich, but neglected source of information is the nonverbal behaviour and communication of the patient. Posture and facial expressions, clothing types and colours, voice tone, odours of the breath, axillae or feet are extremely revealing. Even the person's rhythm of breathing, cutaneous temperature or type of handshake, tolerance to silence or closeness, contain a wealth of information that is usually lost to the clinician. What is important is to learn to mix both intuition and data gathered from the case history through both verbal and non-verbal communication.
Some illness behaviour, according to Mechanic (1986), can be seen as **adaptive efforts**, which often involve the normalization of disruptive or uncomfortable situations. Successful coping may involve the minimization of events or experiences. As Mechanic (1977) suggests, *illness behaviour is a dynamic response to changing personal and social conditions* and is essentially a process through which people attempt to understand and master their problems. The physician needs to understand this, and resolve to help guide the process by opening up constructive paths for the patient whilst at the same time avoiding reinforcing maladaptive response patterns. It is thus **important to establish understanding about meanings** to realize that the construction of health and illness is a social process that is often arbitrary in conceptualization.

*Illness behaviour is sometimes more than just a psychological response to disequilibrium*. It is also a response to troubling social situations and may serve as an effective means of achieving release from certain social expectations, as an excuse for failure or a way of obtaining a variety of privileges or monetary compensation. In addition, the clinician or other health care personnel may represent an important source of social support to those persons lacking in social ties.

### 3.2.5.3 Operationalizing assessment of IBS

Leigh and Reisner (1981, in Leigh, 1981) attempt to **operationalize the biopsychosocial approach** to comprehensive patient evaluation through the *Patient Evaluation Grid (PEG)*. This is a technique in which the three dimensional approach of the biopsychosocial model is intersected by the three time contexts of current, recent and background, to form **nine squares of investigation**

The goal is to ensure that *as much biological information* leading to the diagnosis and treatment of the disorder is combined with the relevant personal and environmental information necessary in managing and understanding the person. Rather than making prior assumptions about psychosocial factors, the PEG attempts to facilitate research into elucidating possible relationships amongst the various factors in the different dimensions and contexts. The **different time contexts** of current, recent and background are valuable in helping clinicians prioritize treatment and intervention decisions. This is congruent with Jasnoski's (1985) assertion that the investigation of past functioning will facilitate clinical investigation by revealing both functional and dysfunctional patterns of individual behaviour. Present functioning will highlight which
aspects of the ecosystem are presently maintaining the overall dysfunctional process so that these aspects can be targeted for change.

In using the patient as the central focus around which individualized treatment plans can be designed, Leigh and Reisner (1981, in Leigh, 1981) believe that the interactional nature of the PEG factors clearly demonstrate the fallacy of isodimensional doctrines that claim that treatment for physical disorders must always be biological and that treatments for psychological distress must always be psychological. By allowing for a three dimensional diagnosis and management plan over time, Schwartz (1982) maintains that the PEG system of organizing clinical data is noteworthy if for no other reason than it encourages health providers to assess individuals comprehensively and to consider illness interactively.

3.2.6 Etiology of IBS

Only with the introduction of the biopsychosocial approach has it begun to be accepted that the causes of functional disorders are complexly interrelated. Whilst previous paradigms have proffered either purely biological (biomedical model) or purely psychological (psychogenic model) explanations, the emerging biopsychosocial paradigm forges a middle way between these two extremes by proposing that genetics or acquired biochemical or structural disorders are modulated by psychosocial stimuli. This shift away from the biomedical model as the dominant model of disease towards a more holistic or systems view, not only offers a clearer concept of the nature of functional disease, but represents a more humane approach that takes greater cognizance of the complexity of whole-person functioning (Drossman et al., 1994; Engel, 1977; Lipowski, 1986).

In challenging the exclusive emphasis on one domain of functioning such as the biological, to the neglect of other domains such as the psychological and social, the biopsychosocial model conceptualizes the development of IBS as a multicausal complex process, whereby both physiological and psychological processes are operative. Drossman et al. (1994) and other gastroenterologists working within the biopsychosocial model propose that psychosocial mechanisms (like the influence of culture, family, personality, life stressors, social support and coping mechanisms) act as modulators of biological states. These modulating or mediating factors shape symptom severity, medication use and illness behaviour and ultimately determine the individual's so called Health Related Quality Of Life (HRQOL). However, given the complex relationships between the various domains of functioning, and the lack of
clarity regarding pathways and mechanisms linking psychosocial factors to disease and illness, it is likely, as Temoshok (1990) suggests, that these connections are nonlinear, multifactorial and change over time.

3.2.6.1 Biological factors associated with IBS
Numerous authors have proposed that most of the IBS symptoms can be attributed to dysfunctional pathophysiological mechanisms within the gastrointestinal tract. However, despite extensive investigations into the subject, the role of such mechanisms remains poorly understood. The failure of laboratory studies to show any morphological, histological, microbiological or biochemical abnormalities in those with IBS suggest that IBS is primarily a disorder of gastro-intestinal motility. However, in this respect, Farthing (1995) notes that we are hampered not only by our rudimentary knowledge of the complex neural and neural-humoral communication systems between brain, mind and gut, but also by our primitive methods for studying intestinal motor function, visceral sensation and their central control. Researchers have consequently been unable to satisfactorily examine those features that may be especially relevant in the etiology of IBS. An additional complicating factor is the heterogeneous nature of IBS and the fact that none of the findings relating to the pathophysiological mechanisms are consistently present in all subjects. This implies that IBS may be composed of sub-groups of patients whose symptoms are linked to different causes (Lynn & Friedman, 1993).

Due to the inaccessibility of the small intestine to manometric and electrical studies, ongoing research has focused largely on the colon and rectum. In addition, the disturbance of bowel habit as a key feature of IBS has led investigators to concentrate on intestinal motility and transit. Primary pathophysiological mechanisms are, according to Camilleri and Prather (1992), abnormal motility, abnormal sensory perception, psychological distress and luminal factors that irritate the small bowel and colon. Prior et al. (1990) identify the various pathophysiological mechanisms to be: exaggerated sigmoid motor responses to a variety of stimuli; lowered visceral sensory threshold to pain; anorectal dysfunction as suggested by such symptoms as urgency of defecation, frequent passage of small amounts of stool and the sensation of incomplete evacuation.

Research findings regarding the major pathophysiological mechanisms will be critically discussed against this general background of research. Although these findings tend to be contradictory and controversial, it is important to note that the
various pathophysiological mechanisms are not mutually exclusive. Thus, although a particular type of dysfunction may predominate, more than one may be operative in any one individual. Essentially understanding these mechanisms and identifying which ones pertain to an individual patient provide a basis for optimizing management of IBS.

3.2.6.1.1 Motility disturbances
In order to discuss disturbances of motility, a brief outline of normal gut functioning is necessary. Once ingested in the mouth, food is transported down the esophagus to the stomach where it is broken down by gastric juices. The small intestine that is connected to the stomach then absorbs nutrients from the digested food. The food waste then passes into the colon where water is absorbed, before moving into the rectum where solid stools are formed. The colon moves unused food or waste by moderate contractions or spasms, which determine the transit time of food through the digestive system (Moser, 1986).

Based on the frequent complaints by IBS patients of regular pain in the lower abdomen, the relief of pain by defecation and the presence of smaller than normal stools, a common assumption has been that IBS is somehow related to altered colonic motility. Accordingly, some researchers (Almy & Rothstein, 1987; Simjee, 1995; Snape et al., 1976, 1977; Whitehead et al., 1980) have found people with IBS to have abnormal motility activity in response to stimuli such as eating, anger, fatty acids, bile salts, hormones or physical and psychologic stress. In addition, Cann et al. (1983) found that patients with diarrhea predominant IBS had accelerated whole-gut transit times and a greater frequency of colonic fast contractions, as well as high amplitude propagated peristaltic contractions. Those with constipation predominant IBS on the other hand, had delays in colonic transit and fewer high-amplitude propagated contractions.

However, as Lennard-Jones (1983) warns, the fact that similar patterns of colonic motility occur in normal subjects under stress and in patients with psychoneurosis but no gastrointestinal symptoms makes it difficult to interpret the clinical importance of these symptoms. In addition, Drossman et al. (1994) emphasize that overall, abnormalities in large and small gut motility and myoelectric activity have not proved to be sensitive or specific. Whilst IBS patients as a group indeed show an exaggerated or altered response to various stimuli in the small and large intestines, no test has as yet been established as a diagnostic standard for the individual with
IBS. Although it makes sense to Drossman et al. (1994) that the presence of both diarrhea and constipation in the IBS profile be due to some sort of motility disturbance, to date there is no firm evidence for this.

3.2.6.1.2 Sensory abnormalities

The inability to demonstrate a precise motility disturbance to explain symptoms and apparent hypersensitivity of the irritable bowel to many stimuli raises the possibility that the symptoms might also be due to altered perception. Much of the debate in this area has consequently centered around whether IBS is a condition in which abnormal motility is normally perceived or in which normal motility is abnormally perceived (Drossman et al., 1994; Farthing, 1995).

The hypothesis that IBS reflects visceral hyperaesthesia or over-sensitivity has initiated various studies into the effects of pain perception of rectal distension by balloon inflation. A number of these have shown that IBS patients have increased sensitivity to balloon distension in the sigmoid colon (Ritchie, 1973; Whitehead et al., 1992), the rectum (Prior et al., 1990) and small intestine (Kellow et al., 1988). These distensions result in a level of pain that is not usually painful to healthy subjects. The lowered pain threshold in response to gut distension is thought to be due to an altered visceral sensation of pain, rather than to altered compliance of the bowel wall or excessive intestinal contractions in response to distension (Lynn & Friedman, 1993; Ritchie, 1973; Whitehead et al., 1992). According to Whitehead et al. (1992) this sensitivity does not seem to be part of a global, lower pain threshold as IBS sufferers produce either normal or reduced pain perception when exposed to other somatic pain stimuli. Furthermore, not all researchers have been able to reproduce this increased rectal sensitivity, whilst others have been able to reproduce abdominal pain with the balloon distension method in the large and small intestine (Farthing, 1995).

The view that the abdominal pain experienced by IBS sufferers is the result of distension or spasmodic contraction of either the large or small intestines, has been challenged by earlier studies showing that in a series of patients complaining of ‘gas pain’, the measured volume of intestinal gas was actually within normal limits (Almy & Rothstein, 1987). Other researchers have found that IBS patients do not have increased intestinal gas, but rather report having abdominal pain at intestinal gas volumes that are lower than those that cause pain in healthy subjects. Thus, whilst increased visceral sensation in patients with IBS appears to be a component of the
disorder, it is probably not the primary defect, partly because a substantial overlap exists between sensation thresholds of IBS patients and those of healthy subjects (Farthing, 1995).

3.2.6.1.3 Disruption of central control mechanisms
Rather than being a primary motility disorder or a primary disturbance of visceral sensation in the intestine, some researchers have proposed that IBS may be caused by disruption on the metalevel of central control mechanisms which modulate both motility and sensation of the gut (Farthing, 1995).

In this regard, there is accumulating research on the frequent occurrence of upper gastrointestinal symptoms such as nausea, vomiting and early satiety; excessive urination at night; the feeling of incomplete emptying of the bladder and difficult or painful intercourse for women (Talley et al., 1990; Whorwell et al., 1984). There is also evidence to suggest that extra-abdominal associations exist such as hyper-reactivity of the bronchi (White et al., 1991 in Farthing, 1995). As smooth muscle is the common denominator in all these extra intestinal locations, a causal hypothesis may be the disruption of central control rather than a primary, multi-organ hyperreactivity or hypersensitivity. Thus instead of merely an irritable bowel, Farthing (1995) points to the possibility of an irritable esophagus, an irritable stomach, an irritable vagina and possibly irritable bronchi.

3.2.6.1.4 A disorder of the enteric nervous system
According to Lynn and Friedman (1993) there is evidence to suggest that the pathophysiology of IBS is mediated by the nervous system innervating the gut. This is supported by Blakeslee’s (1996) observations that the enteric nervous system sends and receives impulses, records experiences and responds to emotions just like the brain. In addition, Els et al. (1995) maintain that the fact that the gut is commonly known as the "little brain", illustrates the numerous histological and physiological similarities between the intestines and the brain.

Almy and Rothstein (1987) suggest that the defect could be contained entirely within the enteric nervous system, which shares many of the characteristics of brain tissue, although it is likely that dysfunction of the extrinsic innervation of the gut is also implicated. The visceral sensation of pain could be altered at the level of sensory receptors or the neural pathways transmitting and processing information as it ascends the brain. Dysfunction of extrinsic innervation could originate within the
pathways of the vagus nerve or within the central nervous system itself. The vagus nerve provides motor and sensory innervation to the entire gastrointestinal tract as far distally as the descending colon, with heavy innervation of the cecum (Lynn & Friedman, 1993).

Although research in these areas has provided limited insights into the complexity of the factors involved in this multi-determined disorder, none of the observations have proved specific enough to qualify as tests for IBS, and most are too involved for clinical usefulness (Drossman et al., 1994).

What is of significance however, is that the enteric nervous system appears to involve a large number of neuroreceptors and neurotransmitters, many of which are also found in the central nervous system. According to Drossman et al. (1994) these neuroreceptors and neurotransmitters are no longer seen as being solely site-specific in function, but rather, to have integrated activities on GI function and human behaviour depending on their location. They point out that “based on these observations, it is no longer rational to try to discriminate whether physiologic or psychological factors cause pain or other bowel symptoms. Both are operative, and the task is to determine the degree to which each is remediable” (Drossman et al., 1994, p. 12).

Thus what is clear on the physiological dimension, is that bowel symptoms (or their absence), do not always correlate with the presence of pathophysiological abnormalities and there are a variety of psychosocial symptoms brought to doctors. These psychosocial factors associated with IBS will be discussed in the following section 3.2.6.2.

3.2.6.2 Psychosocial factors associated with IBS

In terms of the psychosocial modifiers, Drossman et al. (1994) discuss the relevance of three general findings. That psychosocial stress exacerbates GI symptoms; that psychological symptoms modify the experience of illness; and that illness causes certain psychological consequences.

3.2.6.2.1 Psychosocial stress exacerbates GI symptoms.

It is known that stressful stimuli alter both large and small gut motility in all persons, but seem to do so to a greater extent in those with the functional GI disorders. Not only do stressful life events seem to frequently precede the onset and reporting of
IBS symptoms, but IBS patients differ from the healthy by having greater symptomatic and physiological responses to various stressors (Drossman & Thompson, 1992).

This is supported by Chaudhary and Truelove (1962) who studied 130 IBS patients and found that stressful life events influenced the onset and course of gastrointestinal symptoms in around three quarters of those presenting with the IBS symptoms of abdominal pain and altered bowel habits. A significantly greater number of men than women reported psychological stress to be of etiological significance, with stressors ranging from marital difficulties and sexual problems, to business or career problems and a fear of life-threatening diseases such as cancer. In another classical study, Waller and Misiewicz (1969) had similar findings when they followed a sample of IBS patients over six years and discovered that half of these attributed their gastrointestinal symptoms to stress. Furthermore, when Drossman et al. (1982) surveyed the bowel patterns of almost 800 students and hospital employees, stress was reported to affect bowel pattern in almost 75% of the sample, with about half claiming that stress led to abdominal pain.

The increasing recognition of the significant role of stress in the course and development of the IBS has initiated investigations that have aimed to determine whether IBS patients have greater levels of life event stress in comparison with other patient groups and the general population. In this regard, Mendeloff et al. (1970) assessed various sociocultural factors thought to represent life stress such as remarriage and job changes, inconsistency between parent and patient's socioeconomic status as well as the death of a parent prior to adolescence. They found that IBS subjects had higher scores than either patients with ulcerative colitis or the general population.

Overall, it appears that most IBS sufferers are able to recall an acute episode of stress preceding the onset of their symptoms whilst at least half report that their symptoms are exacerbated by stress. Essentially no single life event has proved to be universally significant and no single set of stressors consistently associated with IBS. However, these events generally tend to involve losses and difficulties in occupational or personal circumstances that are perceived by those with IBS to be stressful (Chaudhary & Truelove, 1962; Hislop, 1971). Given the common assumption that personality characteristics may moderate the effects of the stress-
physical illness relationship, this will be discussed in more depth in section 3.3 on personality.

3.2.6.2.2 The modification of the illness experience

Whilst there are clear cultural and biological limitations as to how illness is expressed in modern society, a large proportion of what is viewed as illness appears to be the end-point of a process with a variety of alternative pathways. Adaptive needs interact in a variety of ways with responses to symptoms and illness (Mechanic, 1977; 1986). From an epidemiological perspective, most patient-physician contacts involve symptoms and illness widely distributed in the population and more frequently untreated than treated. This is evident by the fact that although IBS affects up to 20% of the population at any one time, at least 75% of these do not consult physicians for the problem or respond to reassurance and symptomatic therapies (Drossman et al., 1988; Mechanic, 1986; Walker et al., 1990). It appears that the decision to seek medical advice for IBS symptoms is dependent not only on the severity of the symptomatology, but also upon a variety of psychosocial factors (Whitehead et al., 1992).

Regarding the role of gender in western societies, it appears that women with IBS present to doctors twice as frequently as their male counterparts (Latimer, 1983). An associated factor may be that sexual or physical abuse is a frequent, yet hidden experience in women referred for functional disorders (Drossman et al., 1994). Studies by Leserman et al. (1996) and Walker et al. (1992) point to an association of sexual and physical abuse with long-term medical sequelae, and in particular, worse health among those with gastrointestinal disorders. The findings of Leserman et al. (1996) indicate that patients at gastroenterology referral centers generally have high baseline frequencies on most health status indicators such as psychologic disturbance, functional impairment and medical symptoms, resulting in elevated rates of medical care utilization. What these same authors find particularly disconcerting, is that despite the high percentages of abuse history and the association of poor health and higher health care utilization among those experiencing abuse, studies consistently show that health practitioners are unaware of their patient's histories of abuse. The fact that these experiences remain hidden means that women tend not to be referred for psychological counselling to help them address the psychological and physical consequences of abuse.
Childhood illness behaviour patterns are also regarded as a factor shaping patterns of health seeking and medical utilization amongst IBS sufferers. Whitehead and colleagues (1994) found that women who met criteria for a diagnosis of functional bowel disorder (FBD) were more likely to report a history of childhood reinforcement of the sick role than were subjects diagnosed with peptic ulcer disease. Overall, their data supports the hypothesis that specific patterns of illness behaviour are learned during childhood through parental reinforcement and modeling and that these behaviour patterns persist into adulthood. Although the proportion of the variance in adult illness behaviour that is due to childhood social learning appears to be relatively small based on their data, it is clinically important for two reasons. First, this portion of illness behaviour may be preventable if parents are made more aware by their pediatricians of their influence on their child's somatic complaints. Second, the recognition that learning plays a major role in the development and maintenance of symptoms in a subset of patients may suggest new treatment approaches (Whitehead et al., 1994).

A variety of studies reveal that persons experiencing psychological distress are more likely to seek care for comparable symptoms than are those without it. This is supported by Drossman and Thompson (1982) who report that those with IBS or other functional GI disorders tend to show greater psychological disturbances than do otherwise healthy controls or other medical comparison groups. According to these authors, accumulated data on IBS patients reveals that they differ psychologically in many ways from IBS non-patients and normal subjects. Not only do IBS patients have a higher frequency of abnormal personality traits on the MMPI, but also commonly display the affective disorders, panic disorder, agoraphobia and somatization disorder (Fullwood & Drossman, 1995; Walker et al., 1990). This association between IBS patients and psychiatric disorders means that they frequently report pain and other somatic complaints, particularly when under stress; tend to deny or minimize emotional concerns; display concern about health and bodily functions and require reassurance about their health.

A related problem according to Mechanic (1986) is that patients are sometimes unable to differentiate symptoms of psychological distress from those of the illness itself. Many illnesses, as well as the medications for them, result in similar feelings to those characteristic of high levels of stress or psychopathology such as fatigue, restlessness and poor appetite. Patients tend to react experientially to symptoms and illness in terms of their total life experience and the extent to which their total
functioning is affected. Instead of clearly differentiating between purely physical and purely psychosocial, patients provide physicians with information that is a product of both. This is consistent with the mixed clinical symptom picture of the IBS and the fact that Walker et al., (1990) question the uniqueness of the set of symptoms and signs denoting IBS as well as the extent of overlap with other medical and psychiatric illnesses. These authors point out that although patients with the IBS manifest some symptoms that clearly suggest gastrointestinal distress (pain, distension, flatulence and urgency), they also show features of autonomic arousal that are common in mood and anxiety disorders, such as weakness, fatigue, palpitations, nervousness, dizziness, headaches, hand tremor, back pain, sleep disturbances and symptoms of sexual dysfunction. It is the combination of these gastrointestinal and psychiatric symptoms that appears to separate patients with IBS from other patients with pure gastrointestinal or psychiatric illness, or from those IBS sufferers that report their symptoms and those who do not.

Major individual differences in psychological orientations and dispositions appear to influence patient behaviour. Much research has demonstrated that pain has an important subjective component and that there is no clear relationship between the amount of tissue damage and the degree of discomfort reported by patients (Mechanic, 1986). This variation in personal predispositions is consistent with the IBS statistics quoted earlier, where only a minority of persons experiencing IBS actually seek medical attention. In a study by Drossman et al. (1988), the data indicated that IBS patients report more pain and have more frequent bowel movements than IBS non-patients, suggesting that pain and diarrhea are the most important symptoms associated with patient status. However, when they controlled for bowel symptoms, these authors found that IBS patients are still psychologically different from non-patients and normals, and that IBS non-patients exist on a psychosocial continuum between patients and normals, but are more similar to normals. In other words, the psychologic disturbances characterize a subset of people with IBS — those who seek help. These findings led Drossman et al. (1988) to conceptualize the role of psychosocial factors in the IBS as being an interactive or modulating one. Psychosocial factors do not cause bowel symptoms but rather interact with them so as to shape the illness experience and influence behaviours such as health care seeking and utilization.
3.2.6.2.3 The consequences of illness
The effects of illness on individual health in terms of general well-being, daily functioning, concerns related to symptom control as well as implications of the illness in terms of future functioning both at home and at work have been well documented. Drossman et al. (1994) use the broad concept Health Related Quality Of Life (HRQOL) to describe the patients standing in terms of perceptions, illness experience and functional status relative to the illness. Measurement of the concept differs from an objective disease assessment from the physician’s point of view in that it includes the individual's subjective perception of psychosocial and disease related factors. The reciprocal relationship between HRQOL and the severity of the disorder is emphasized and pictorially represented in Fig. 3.1.

**PSYCHOSOCIAL MODIFIERS**

**PREDISPOSING FACTORS**

![Flowchart of IBS Development](image)

**Fig. 3.1 The Development of IBS (Drossman et al., 1994)**

Assessment of the patient's quality of life and daily level of functioning is also important. When little can be done to cure the symptoms, the therapeutic objective then becomes improving the individual's functioning in society. As life style changes may be necessary, patients are encouraged to stop smoking, to partake of regular meals, to reduce or cut out shift work and to travel less. Stress-management or relaxation programs may help improve quality of life and daily functioning. As portrayed in Fig. 3.3, the developing process of IBS either leads to patient or non-
patient status, and symptoms of IBS patients may be graded as either mild, moderate or severe.

It becomes clear that one person afflicted with a functional bowel disorder who has no psychosocial disturbances and good coping strategies and social support may not seek medical care at all. Another, having similar symptoms, but who has co-existent psychiatric symptoms, high life stress or poor social support networks may end up seeing medical care specialists frequently. The implications for caregivers and investigators, is that whilst psychosocial factors are not etiologic, they are relevant in understanding the patient’s adjustment to a functional GI disorder (Drossman et al., 1994).

3.2.7 Management and treatment of IBS
The management and treatment of patients with irritable bowel syndrome poses a special challenge to care-givers based on its high prevalence, its biologic and symptomatic heterogeneity, as well as its concomitance with psychopathology and the various levels of disability it engenders. Although to date, no one treatment has been shown to consistently render a therapeutic effect for those suffering from the IBS, Weber and McCallum (1992) argue that the lack of a universally accepted therapeutic agent does not preclude individualized therapy for selected symptoms. Indeed, clinically and therapeutically disparate subgroups of IBS patients are emerging from subgroup analyses of past clinical trials. Based on the biopsychosocial hypothesis that physiologic and psychosocial factors interact to explain symptom severity and illness behaviour, it is in fact rational to consider both in the treatment planning and overall management of the condition (Drossman et al., 1994; Klein, 1988).

The following sub-sections examine the role of general factors such as the therapeutic relationship, education and the patient’s own agenda in the illness process; the role of physiologic treatments such as diet and drugs and lastly the role of psychological and behavioural factors in the treatment and management of the IBS.

3.2.7.1 The therapeutic relationship
There is common agreement amongst gastroenterologists (Drossman et al., 1994; Lynn & Friedman, 1993; Steinhart, 1992) that the basis for any treatment plan involves the establishment of a secure, strong, trusting and non-judgmental
physician-patient relationship which is based on open and clear communication. According to Crouch (1988), the potential for miscommunication, misunderstanding and physician indifference or antipathy is high with IBS patients, who may respond poorly to any or all treatments and remain symptomatic for years. Doctors have the ability to enhance the therapeutic relationship via an attitude and approach that involves taking an interest in the patient's symptoms, showing concern towards their suffering and helping to set realistic expectations and consistent limits. The significance of this relationship is supported by evidence that shows patients with functional GI disorders to have between a 30-80% placebo response rate regardless of treatment (Creed & Guthrie, 1989).

Various authors have stressed the importance of the first consultation for a patient suffering from IBS (Drossman, 1989; Lynn & Friedman, 1993). In this respect, the educative role of the physician is a very important traditional one. A clear explanation of the patient's problem is the central goal of patient education and means taking the time to explain the syndrome itself, possible mechanisms of symptom production, as well as making an effort to allay any fears of serious organic disease. A good therapeutic relationship, together with strong educative input could prove to be the physician's most valuable therapeutic tool as the patient's understanding forms the basis for informed co-operation necessary for optimal long-term therapeutic results (Crouch, 1988).

It is also important to take into account the patient's personality, recent life stresses such as divorce, bereavement or job loss as well as the possible presence of anxiety or depression. As psychological factors may alter perception of symptoms it is important that the effect of such stressors be explored and their role in symptom generation discussed. In this respect, one strategy that can radically modify patient's attitudes towards their problem is to express the IBS symptomatology as a useful barometer of their life stress, a message from the body about how well they are coping with difficult issues and situations. The clinician can anticipate that many IBS patients will become symptomatic intermittently for the rest of their lives, but that the associated distress, inconvenience, and anxiety can usually be kept to a manageable level most of the time (Crouch, 1988; Drossman et al., 1994; Farthing, 1995).

### 3.2.7.2 Physiologic interventions

The discussion of physiological factors is divided into the topic of diet in subsection 3.2.7.2.1 and is followed by the topic of medication in subsection 3.2.7.2.2.
3.2.7.2.1 Diet

The assumption that diet plays a significant role in the pathogenesis, treatment and exacerbation of IBS symptoms is currently in vogue (Dawson, 1984; Hambleton-Jones, 1994). However, whilst treatment trials administered by Harvey et al. (1987) revealed that most patients regarded diet to be the most important aspect of long-term treatment, other researchers have indicated that diet has in many cases proved to play a purely coincidental role in symptom improvement (Steinhart, 1992).

Although dietary fibre supplements have been the cornerstone of IBS therapy for the past few decades and are inexpensive and benign, most studies indicate that wheat and oat bran are again little more than effective placebos in the average patient with IBS symptoms (Crouch, 1988). Dawson (1984), who refers to the profound placebo effect of various dietary manipulations, echoes this sentiment. He refers to a study where biscuits (half containing bran) added to the diet led to an initial substantial improvement in three-quarters of all patients but where the placebo effect tended to wear off after three months. The value of bran and high fibre diets is also controversial amongst researchers in that their effect varies according to the symptom being treated. Although Schuster (1983) reports that high fibre diets are widely accepted in treating IBS patients with constipation, Prior (1995) points out that bran and high fibre diets seem to have little effect on symptoms of abdominal pain and may even exacerbate the symptoms of distension and diarrhea.

Burns (1990) suggests that whilst there is no evidence to support the hypothesis that IBS symptoms result from true food allergies, there is mounting evidence to suggest that food intolerance may play a significant role. According to Hunter (1985, in Burns, 1990), many IBS patients have shown an intolerance to foods such as cereals, dairy products, citrus, potatoes, caffeine in tea and coffee, alcohol as well as food additives and preservatives. However, the meager research on the topic makes food tolerance a potential future area of treatment investigation.

3.2.7.2.2. Medication

Medication therapy focuses on alleviating the predominant symptoms of IBS. Anti-diarrheal agents such as diphenoxylate, bismuth subsalicylate (Pepto-Bismol) or loperamide (Imodium) are commonly used and act to reduce the urgency and frequency of bowel movements. In addition, the tricyclic antidepressant, desipramine, significantly relieves diarrhea and associated pain. These effects appear to be at
least partly due to its anticholinergic actions. Calcium-channel blockers may be used as secondary treatment (Camilleri & Prather, 1992; Crouch, 1988).

In those patients with predominant pain-gas-bloat, a plain abdominal radiograph usually provides initial assurance that there is no mechanical obstruction in the gut. Thereafter, as there is no currently available medication that is of proven efficacy, Camilleri and Prather (1992) recommend the avoidance of gas-forming foods such as legumes, lactose and fructose, and the use of antispasmodic agents with or without anxiolytics or analgesics which may provide some symptomatic relief. Due to the addictive potential of certain benzodiazepines and narcotic analgesics, specialist warn that these should be avoided in these chronic, nonprogressive conditions like the IBS.

Clouse (1994) points out that antidepressant agents have been used to treat a variety of chronic pain syndromes, particularly the subgroup of IBS patients where pain or discomfort is the dominant symptom. Studies of antidepressants in IBS suggest that they can beneficially influence the motor symptoms as well as the discomfort and pain. However, as the adverse effects of antidepressants are common, it remains advisable to reserve such treatment for patients with protracted or severe symptoms and for those who have failed to respond to other forms of management. Clinical and investigational observations do not support restricting the use of these medications to the subset of patients with identifiable psychiatric illness. Overall, it appears that antidepressants are not appropriate for initial treatment of functional gastrointestinal disorders in most patients nor should their use replace careful evaluation of the many factors involved in symptoms production (Clouse, 1994).

For those patients that suffer from constipation predominant IBS, increased bulk with fibre or roughage has usually proved to be the most effective. In addition, an osmotic laxative or stool softener may be included if the former is insufficient alone. In those suffering from pain with constipation, effective treatment of the constipation usually helps to alleviate the pain (Camilleri & Prather, 1992).

3.2.7.3 Psychosocial interventions

According to Whitehead (1992), multiple controlled studies have shown that a variety of psychological treatment approaches provide more benefit for IBS patients than standard medical therapy. These include brief insight-oriented psychotherapy,
relaxation-based stress management training, cognitive-behavioural therapy and hypnosis. However, due to the great heterogeneity in the studies done to assess the efficacy of psychological treatments, no two studies are comparable in terms of patient selection and most studies reveal methodological flaws that limit their generalizability (Klein, 1988). In spite of these difficulties, various researchers concur that the common factors that facilitate the action of psychological treatments include motivation for treatment, the roles of education and relaxation and the close therapeutic relationship (Blanchard et al., 1987; Whorwell et al., 1984).

Latimer (1981) advocates a variety of behaviour therapy techniques such as systematic desensitization, flooding, biofeedback and operant conditioning methods for treating the IBS. However, Whitehead (1992) contends that interest in these techniques for treating IBS has declined substantially over the past decade and is gradually being replaced by an increase in psychotherapy and stress management approaches. Crouch (1988) suggests that other potentially useful but relatively untested techniques for IBS include deep muscle relaxation, visual imagery and meditation. If family factors are thought to be prominently involved in the patient's difficulties, family therapy may prove to be productive either as a one-time intervention or over an extended period, as may group therapy in the form of support groups.

Alternatively, Drossman et al. (1994) and Steinhart (1992) classify treatment of the IBS in terms of whether symptoms are mild, moderate or severe. Most patients with mild symptoms usually have no significant functional impairment and respond to education, dietary adjustments, achievement of a healthier life style and reassurance that IBS is not life threatening. Those with moderately severe symptoms tend to have intermittent disruption of activities and show greater psychological distress than those with mild symptoms. They often require the use of medication to treat either of the common symptoms (diarrhea, constipation or pain), often used in conjunction with behavioural treatments and psychotherapy as usually at this stage the IBS cannot be cured only controlled. Even in those patients with severe or intractable symptoms, the goal is to relieve symptoms enough to improve daily function, rather than striving to eliminate them. However, according to Drossman et al. (1994) this group of patients tends to hold unrealistic expectations about being cured and are usually unresponsive to psychotherapy or pharmacologic agents directed at the gut. Antidepressant medication, an ongoing supportive therapeutic relationship and pain treatment are methods that work best with this latter group of IBS patients.
Overall, it appears that treatment of this chronic, complex and multicausal condition is probably best accomplished by a comprehensive and individualized blend of patient education, support and psychotherapy, as well as by the pharmacologic treatment of selected symptoms at appropriate times.

3.3 Chapter summary and conclusion
As outlined in this chapter, the extensive research conducted on the Functional Gastrointestinal disorders has certainly made a substantial contribution towards creating a greater awareness and understanding within the field as a whole. However, it is also clear that an enormous amount of controversy still clouds our understanding of this group of disorders, particularly irritable bowel syndrome, whose enigmatic nature continues to challenge practitioners and sufferers alike. The recent adoption of a biopsychosocial perspective by international researchers has further highlighted the complexity of IBS by implicating the role of both biological and psychosocial correlates in the development and maintenance of the disorder. In terms of the latter, numerous studies have shown that psychiatric and psychological complications are part of the IBS syndrome and point to the co-existence of medical and psychiatric disorders in a majority of IBS sufferers. Given this, the treatment orientation has become far more holistic, with increased attention being paid to psychosocial and behavioural concomitants along with the medical and physiological, and where the goal has shifted away from a curative approach towards better understanding and management.

In line with the aims and objectives of this specific study, chapter four explores one psychosocial concomitant in greater depth, namely personality. After laying a brief theoretical foundation on personality in section 4.1, the discussion turns to the internal route that personality can affect health and illness in section 4.2 and then the external route in section 4.3.
CHAPTER 4

Empirical Foundation of the Study: Personality, Health and Health Behaviours

The notion that personality characteristics might influence vulnerability to illness and illness progression as well as health and health promotion, has been suggested by past research, although the factors responsible for this association have not yet been determined (Booth-Kewley & Friedman, 1987; Marshall et al., 1994; Matthews & Haynes, 1986). Consequently, the personality-health relationship represents the ideal interface for the study of the mind-body link and the past two decades have seen a resurgence in interest in this relationship based on accumulating evidence that the study of personality as it relates to health has explanatory and perhaps even predictive value (Smith & Williams, 1992). In this regard, Friedman (1991) suggests that there are two main paths through which personality might influence health and illness. The internal physiological route and the external behavioural route. The internal route involves examining the role of stress and disruptions in normal emotional functioning, whilst the external behavioural route sees personality as impacting on health through a variety of behaviours such as smoking, overeating, exposure to violence, drug abuse and dysfunctional friendship patterns. When the mutual influence of stress, emotional turmoil and behavioural pathogens are added together, personality's role in illness and disease is truly astounding (Friedman, 1991). Thus, if there are such clear links between personality and disease, it makes sense that there are strong links between certain personalities and health, particularly health habits or health behaviours.

Section 4.1 examines the theoretical underpinnings of personality, touching on the difference between personality and temperament, personality as a system and the notion of personality traits and the Five-Factor Model. Section 4.2 examines the internal physiological route through which personality might influence health and illness and discusses the empirical findings linking stress and emotional dysfunction with illness and health in general and IBS in particular. This is followed by section 4.3 on the external route through which personality may influence health and illness, highlighting the role of behaviour in general and health behaviours in particular.
4.1 Personality

In laying the theoretical foundation for the understanding of personality, Section 4.1.1 attempts to clarify the confusion that surrounds the terms personality and temperament, whilst section 4.1.2 examines the notion of personality as a system. Thereafter, the focus is on personality traits in 4.1.3 and the Five-Factor Model in 4.1.4.

4.1.1 Distinguishing between personality and temperament

The term ‘personality’ came into being as a metaphor, taken from the Latin persona, meaning theatrical mask. As the wearer of a particular mask could be expected to behave in a consistent manner throughout a performance, personality was seen as something imposed externally on a person. Although other views, (England, 1991), have conceptualized personality in terms of the introspective or ‘behind the mask’ approach, it would appear that personality reflects both the introspective and extraspective approaches, which is what Maddi (1996) has tried to capture in his definition of personality as:

"...a stable set of tendencies and characteristics that determine those commonalities and differences in people’s psychological behaviour (thoughts, feelings and actions) that have continuity in time and that may not be easily understood as the sole result of the social and biological pressures of the moment" (Maddi, 1996,p.8).

In distinguishing between the ‘core’ and ‘periphery’ of personality, Maddi (1990) incorporates both the biologically anchored or unlearned aspects of the core, as well as the necessarily learned aspects of the periphery. The distinction that Maddi (1996) makes is a valid one, given the historical controversy surrounding the terms temperament and personality as to whether they are synonyms, or whether they refer to two different aspects of the person. According to Strelau et al. (1985) and Strelau (1987), these terms are different, in that temperament refers to early developing, stable individual differences that relate to more stylistic behavioural tendencies based on the constitutional or biologically determined makeup of individuals. In contrast, he envisages personality to be a much broader concept, containing characteristics that are primarily determined by social factors like values, attitudes and interests (Angleitner & Ostendorf, 1994). Maddi’s (1996) distinction is useful in underscoring the view that human personality must be understood from two different standpoints. The first being the difference between the constitutionally determined and socially
learned aspects, and the second, of discriminating between universal tendencies and particular individual differences (McAdams, 1992).

4.1.2 Personality as a system
Since ancient times there have been claims that personality dispositions may play a role in influencing health and illness, given that people have different temperaments, face different challenges and employ different coping skills. In this respect, the shift to whole person care involves recognizing the autonomy or uniqueness of the individual system and how this uniqueness influences the manifestation of illness. This autonomy or uniqueness, commonly termed ‘personality’ is defined by Allport (in Kobasa, 1990, p. 25) as "the dynamic organization within the individual of those psychophysical systems that determine his characteristic behaviour and thought". The phrase dynamic organization emphasizes the interacting and integrating patterns of the various aspects of the personality system and implies that disturbance in any one part will reverberate through and affect other parts of the personality.

The conceptualization of personality as a system is not new, and has been reflected in the ideas of major personality theorists such as Freud, Murray, Lewin, Jung, Angyal and Maslow. Starting with Freud, most theorists of personality have characterized persons as dynamic organizations of different kinds of responses or functions that have continuity in time and across contexts, and that are not solely the result of the social and biological pressures of the moment (Ford, 1987). The significance of the systemic metaphor is vested in the notion that the interaction of the various subsystems creates the emerging entity of personality itself, an entity that is much greater than the sum of its parts (Emmons, 1995). However, like any system, understanding the totality and complexity of personality involves working with structure and process, stability and change. Due to the vastness of the personality topic, it becomes necessary to focus on one aspect of personality, which for the purposes of this study will be the structure and stability of personality systems in the form of traits, to be explored in the following section.

4.1.3 Personality traits
The following discussion of personality traits begins with the definition of traits in section 4.1.3.1, and is followed by an explanation of the Big Five as a trait model of personality in 4.1.3.2, and criticisms of this model in section 4.1.3.3.
4.1.3.1 Definition of trait

One of the most persistent debates within personology has been over the extent to which behaviour and personality characteristics tend to be situation-specific or display generality across occasions and situations. Thorndike viewed personality as composed of organizations of discrete habits and therefore, relatively situation-specific. Allport, in contrast, viewed behaviour as centrally organized and purposive and believed therefore that personality traits should display cross-situation generality. Mischel, on the other hand, marshalled evidence and arguments for situational variability and against generalized personality traits. While acknowledging that people do behave differently in different situations, Cattell, Block and Epstein, along with others, have presented evidence and arguments that some cross-occasion, cross-situation generality also exists (Ford, 1987). Overall, as Deary and Matthews (1993) point out, the upshot of the person-situation debate is a reasonable consensus over some form of interactionism, where both person and situation interact to shape behaviour.

Although the attempt to separate out trait components is somewhat artificial in the light of interactionism, the centuries old debate that has existed over which are the most appropriate building blocks of personality continues into the present day (McAdams, 1995). The trait perspective, which is concerned with individual differences, is but one of several approaches to understanding personality (Buss, 1989). Despite increasing agreement on the importance of traits, there is considerable confusion amongst personologists about the meaning of the term 'trait' and striking conceptual differences between trait theories. Technically a trait is a summary description of some kind of human functioning that is "temporarily stable and cross-situationally broad" (Ford, 1987, p. 635). McCrae and Costa (1984) point out that most definitions of traits include certain elements: that traits are dispositions or tendencies to act or react in certain ways, that they are relatively broad or general in application, and that they endure over time. Traits are essentially hypothetical constructs or characteristics ascribed to individuals to account for certain consistencies in their behaviour. Since there are many different ways of looking at this consistency, traits identified are to some extent arbitrary and vary between Eysenck’s three, Guilford’s ten, Cattell’s sixteen and McCrae and Costa’s eighteen.

Allport (Kobasa, 1990) initially distinguished between consistencies typical of a specific person, termed individual traits or dispositions, and those typical of people in general, termed common traits. Cattell (Ford, 1987) used factor analysis to determine different kinds of traits. Surface traits are clusters of manifest variables; source traits
are underlying variables manifest in surface traits; *dynamic traits* represent motivational consistencies; *ability traits* represent different kinds of cognitive and competence consistencies; *constitutional traits* have strong genetic determinants and *environmental mold traits* are primarily learned consistencies.

Clearly, these different types of categories refer to differences in *kind, determinants* as well as *levels of analysis*. Thus, different kinds of consistency are apparent at different levels of analysis, each level being useful for some purpose. Furthermore, given these different levels of analysis there may be variability at one level of analysis and consistency at another. What is important, is to avoid unnecessary confusion by specifying the level of analysis that one is working at. Both Allport and Cattell (Ford, 1987) conceived of traits as being hierarchically organized, and of personality as a complex and differentiated organization of traits that provides functional consistency but that undergoes developmental change. What they did not provide was a theoretical framework for explaining the kinds and organizations of consistency that might develop. This will be explored in the following section along with the Big Five traits that have emerged.

**4.1.3.2 The Big Five**

Although the *meaning of trait* may be in dispute, common agreement seems to have emerged in recent decades on the *number and nature of these dimensions* (McCrae & Costa, 1995; Waller & Ben-Porath, 1987). Based on the *re-analysis of classic peer-rating studies* (Digman & Takemoto-Chock, 1981), the *investigations of personality lexicons* (Goldberg, 1990; Peabody & Goldberg, 1989), the development of *personality inventories* designed to assess the five factors through self-report (McCrae & Costa, 1995), the discovery of the five factors in *omnibus personality measures* such as the Personality Research Form (Costa & McCrae, 1992) and the Adjective Check List (John, 1990), and the empirical *demonstration of substantial longitudinal consistency* in personality traits subsumed within the five-factor framework, have all converged in recent years to provide a theoretical structure of surprising generality (McAdams, 1992).

The remarkable consensus among most, but not all, descriptive taxonomists is that the *five robust factors* of *Neuroticism* (Emotional Stability), *Extraversion* (Surgency), *Openness to Experience* (Culture or Intellectance), *Agreeableness* (Warmth) and *Conscientiousness* (Will) are both necessary and reasonably sufficient for describing at a global level the major features of personality (Deary & Matthews, 1993; McCrae,
& Costa, 1995). The five factors seem to cover a vast conceptual space that encompasses the central human concerns of power (Surgency), love (Agreeableness), work (Conscientiousness), affect (Emotional Stability), and intellect (Culture) (McAdams, 1992; Peabody & Goldberg, 1989). These factors appear to be inherent in a wide variety of standard systems for personality description, including Cattell's 16 factors, Eysenck's "big 3", Murray's 20 needs, Guilford's 10 temperaments, Jung's types and the psychodynamic descriptors contained in Block's California Q-Set (McAdams, 1992; McCrae, 1989). Overall, these five factors have proved robust across different groups of subjects, item pools, instruments and methods of analysis, as well as across different languages and cultures (Halverson et al., 1994).

Although theoretical explanations for these remarkable empirical regularities have begun to emerge (Buss, 1991; Costa & McCrae, 1992; John, 1990), the Big Five Model in adulthood owes its power more to the replicability of empirical results than to a set of generally accepted theoretical axioms about human personality structure. In fact, the Big Five Model has been distinguished from the Five-Factor Model (FFM) which will be elaborated on in section 4.1.4, in that it is largely derived from lexical data and is hence a model of personality attributes that is descriptive rather than explanatory. In contrast, the FFM includes a dispositionalist explanatory hypothesis that the five factors correspond to biological traits or endogenous basic tendencies. The FFM is based in part on the findings from cluster analyses of the 16 PF and in part on two additional dimensions taken directly from the lexically based Big Five Model. Research on the FFM has centered on personality questionnaires anchored in English. Although the two models are similar in many respects, they should not be confused (Halverson et al., 1994; Saucier & Goldberg, 1996).

4.1.3.3 Criticisms of the Big Five

One of the major criticisms to be directed at the FFM is that the five factors are either too few or alternatively, too many (John, 1990). This is supported by McAdams (1992) who questions the presumed comprehensiveness of the five factors. The model's claims to covering the entire universe of personality traits rests on three separate through related achievements. These include the ubiquity of the five-factor solution in factor analysis and self-and peer ratings, the discovery of the Big Five in the constructs offered by other personality theories and the replication of the five-factor structure in other languages and cultures.
Of the three claims, the first seems to be the strongest achievement, although even here some discrepancies are noted. As Briggs (1989, in McAdams, 1992) points out, the five-factor structure of trait descriptors is recognizable across samples and investigators, but the degree of correspondence is less than ideal. Furthermore, there is some disagreement as to the existence of a sixth factor, with some researchers splitting Surgency/Extraversion into two factors, 'sociability' and 'activity'. In addition, Factor V, Openness has been the subject of lively debate among those who see it primarily as a factor of intellect (Peabody & Goldberg, 1989), those who consider its essence to be a general openness to experience (McCrae & Costa, 1984) and those who argue that it is probably both (Digman & Takemoto-Chock, 1981).

A further criticism of factor-analytic studies of personality traits is that they are arbitrary and atheoretical. It is well-known that whilst factor analysis is a sophisticated quantitative tool, a great deal of subjective and often arbitrary decision making goes into the choice of items, the choice of the procedures and rotations as well as the labeling of obtained factors. Consequently, many (Briggs, 1989 in McAdams, 1992; Waller & Ben-Porath, 1987) argue that no coherent and falsifiable explanation for the five factors has yet been put forward and have asked why these particular five factors? Whilst proponents of the model (Goldberg, 1990; McCrae & Costa, 1984) assert that language systematically and adequately reflects social and psychological reality, critics believe that they have not offered a satisfying conceptual answer and maintain that the empirical retorts offered by proponents can not always be operationalized adequately. In terms of the cross-linguistic and cross-cultural relevancy, McAdams (1992) maintains that although research into English based measures have shown the adequacy of the five factors, further studies are needed before investigators can assess the extent to which the five factors model provides an adequate taxonomy for personality descriptors in other languages and cultures.

Another central criticism concerns the inherent confusion between the descriptive and explanatory role of traits and many critics are wary about the five factors in the light of these two goals. Investigators such as Pervin (1994) and Mischel and Shoda (1994) are concerned that the factor structure of personality descriptors is becoming equated with the processes that underlie and generate behaviour. They assert that if the factor structure of the Big Five for describing individual differences are also to become the basic psychological units for understanding what motivates and generates those individual differences, then the evidence and reasoning that supports this transformation must be made explicit. Hence as pointed out by John...
(1990), because the Big Five operate at such a general level of analysis, they might not be particularly useful in the prediction of specific behaviour in particular situations, though they may be valuable in the prediction of general trends across specific kinds of situations. Narrower traits tend to be more homogeneous and hence better predictors of behaviour in everyday contexts. According to the Big Five critics, these are more like five basic trait categories, than five basic traits. For those demanding deeper explications of behaviour, traits themselves require further explanation and critics believe that proponents of the Big Five need to be far more explicit concerning the extent to which their broad dimensions which appear to be useful for prediction and description, may also be useful for explanation (McAdams, 1992).

4.1.4 The Five Factor Model
Section 4.1.4.1 describes the function of the model as a broad trait theoretical framework of personality whilst section 4.1.4.2 discusses the nature of the five factors in greater depth.

4.1.4.1 The FFM as a metatheoretical framework
McCrae and Costa (1996) stress that the FFM is not the product of mindless empiricism, but a rich conceptual system that is not meant to replace the grand theories of personality, because it describes only one aspect of the person, but which instead, can form the nucleus for a theory of personality that might serve as a model for a new generation of empirically based theories. It is more akin to a metatheoretical framework for describing personality and identifying the categories of variables that a complete theory of personality ought to address. Based on the lack of a unified framework for the study of personality, McCrae and Costa (1996) believe their Five-Factor Model, although by no means a finished product, can offer a rough prototype of the next generation of personality theories. Given the sufficiently strong empirical basis, McCrae and Costa (1996) believe that any complete theory of personality should include five basic topics or variables that recur in many definitions of personality. Fig. 4.1 shows boxes that label these five elements, with the sixth element representing the dynamic processes that specify the nature of the interaction amongst the elements.
Basic tendencies refer to the universal raw material of personality capacities and dispositions that are generally inferred rather than observed. These define the individual's potential and direction and may be inherited, imprinted by early experience or modified by disease or psychological intervention. For many theorists this is the true core of the person, the real person behind the mask. McCrae and Costa (1996) see personality traits as the most important basic tendencies or abstract dispositions.

Characteristic adaptations are acquired skills, habits, attitudes and relationships that result from the interaction of the individual and the environment; they are the concrete manifestations of basic tendencies. The distinction between the two categories of basic tendencies and characteristic adaptations is crucial to McCrae and Costa's (1996) metatheoretical framework as it explains how universal dimensions of personality can exist in widely different cultures and how the enduring quality of traits is wholly consistent with the observable changes in behaviour that occur with age.

The Self-Concept consists of knowledge, views and evaluations of the self, ranging from miscellaneous facts of personal history to the identity that gives a sense of purpose and coherence to life, expressed in the life narrative or personal myth (McAdams, 1995). The Objective Biography consists of every significant thing that
persons have felt, thought or done throughout their lives, whilst *External Influences* refers to the psychological environment of the individual and include developmental influences and current situations at both the global and specific situational levels. The *Dynamic Processes* specify relations among the key elements of the theory and bring the model to life showing paths of development, change and dynamic equilibrium accounting for the ongoing stream of behaviour and experience (McCrae & Costa, 1995, 1996).

4.1.4.2 The nature of the five factors

The following discussion of the nature of the five main trait factors includes a brief examination of their proposed causes in section 4.1.4.2.1 and a description of the traits and their facets in section 4.1.4.2.2.

4.1.4.2.1 Origins of the five factors

The *Five-Factor Model (FFM)* of McCrae and Costa (1995) starts from the assumption that the Basic Tendencies or *five source traits* (Neuroticism, Extraversion, Openness to Experience, Agreeableness and Conscientiousness) are *basic generic orientations* present in *all people* to varying degrees, and which, if they change at all, do so through biological maturation rather than learning. Hence from Maddi’s (1996) perspective, the Five Factors or traits are part of the core of personality. Scientific evidence for this biological substrate is partly provided by studies that show co-variation across time, twin pairs and cultures, co-variation that cannot be readily explained by such alternatives as transient influences, learned responses and cultural norms. Studies showing the heritability of personality traits provide the most powerful evidence, although heritability is sufficient but not necessary to show there is something intrinsic to the person that accounts at least in part for consistency in behaviour and experience (McCrae & Costa, 1995). Thus these authors’ conception of personality traits makes them more akin to the notion of temperament (Strelau, 1987) where both are constructed as biologically based tendencies that help shape the cause of development.

4.1.4.2.2 The five domains

The five broad factors of *Neuroticism, Extraversion, Openness, Agreeableness* and *Conscientiousness* are *also defined* by more *narrow traits or facets*, the number and nature of which do not hold the same level of agreement as the five source traits. However, Costa et al. (1991) point out that they identified six facets for each domain, not because each is naturally divisible into six parts, but because at least six
distinctions were suggested in the literature. For each domain they sought to identify traits that were familiar through previous theory and measurement, and which were roughly comparable in breadth and maximally distinct from each other. Instead of being viewed as an exhaustive list, these facets should be seen as examples or representatives of the five domains.

Neuroticism (N):
This domain refers to level of emotionality of persons, contrasting adjustment or emotional stability with maladjustment or neuroticism. The general tendency to experience negative affects such as fear, sadness, embarrassment, anger, guilt and disgust form the core of the Neuroticism domain. Although clinicians distinguish among many kinds of emotional distress, from social phobia to agitated depression to borderline hostility, innumerable studies have shown that individuals prone to any one of these emotional states are also likely to experience others. However, Neuroticism includes more than susceptibility to psychological distress, as individuals high in this dimension are also prone to have irrational ideas, to be less able to control their impulses and to cope more poorly than others with stress (Costa & McCrae, 1987, 1992). Although high scorers on this dimension may be more at risk for some kinds of psychiatric problems, the Neuroticism scale is not a measure of psychopathology, and it is possible to obtain a high N score without having any diagnosable psychiatric disorder. Conversely, not all psychiatric categories imply high levels of N. Individuals who score low on Neuroticism are emotionally stable in that they are usually calm, relaxed, even-tempered and cope with stress well.

Each of the six facets of N, Anxiety, Depression, Self-Consciousness, Vulnerability, Impulsiveness and Hostility are significantly related to negative affect and lower life satisfaction, giving considerable support to the idea that N is indeed related to psychological well-being. Anxiety and hostility are the dispositional forms of two fundamental emotions, fear and anger. Although all persons experience these emotions from time to time, the frequency and intensity with which they are felt vary between persons. Individuals high in anxiety are nervous, highly-strung, tense and prone to worry. Hostile people show a similar proneness to experience anger and tend to be irritable and hard to get along with (Costa & McCrae, 1992).

The emotions of sorrow and shame form the basis of the traits of Depression and Self-consciousness. The former is the disposition to experience sadness, hopelessness, loneliness, and feelings of guilt and diminished self-worth. Those high
in self-consciousness are more prone to feeling shame or embarrassment and are particularly sensitive to ridicule and teasing because of their feelings of inferiority. The last two facets of Neuroticism are more often manifest in behaviours than in emotional states. As Impulsiveness is the tendency to give in to temptations and be overwhelmed by desires, impulsive people tend to overeat and overspend, to drink, smoke and use drugs. Vulnerability designates an inability to deal adequately with stress leading to panic in emergencies, break down and dependency on others for help. Although different persons will show different profiles on each of these facets, generally, those high in N will be high on all of the facets (Costa & McCrae, 1987, 1992).

**Extraversion (E):**
The conceptualization of Extraversion in the NEO-PI-R is different to the Jungian definition. As a dimension of interpersonal tendencies it means that extraverts generally like people and are sociable, prefer large groups and gatherings and tend to be assertive, talkative and active. They also crave excitement and stimulation and are upbeat, energetic, optimistic and cheerful in disposition. Costa and McCrae (1992) point out that Introversion should be seen as the absence of extraversion rather than the opposite. Thus, introverts are reserved rather than unfriendly, independent rather than followers, even-paced rather than sluggish. They are not necessarily shy but prefer to be alone and do not necessarily suffer from social anxiety. Although they are not as exuberant as extraverts, they are not unhappy nor pessimistic.

The six facets of E are Warmth, Gregariousness, Assertiveness, Activity, Excitement-Seeking and Positive Emotions. The first three describe interpersonal styles and the latter three temperamental traits. Warmth or attachment is associated with personal intimacy. Warm people are affectionate and friendly whilst cold persons more formal and impersonal, with weak attachments to others. Gregariousness or sociability is the desire to be with others, whilst Assertiveness refers to a natural leadership ability, the need to take charge and to readily express feelings and desires. Extraversion is also reflected in, high Activity or rapid tempo and vigorous movement, a sense of energy and a need to keep busy. Whilst Active people lead fast-paced lives, those low in this dimension are more leisurely and relaxed though not necessarily sluggish or lazy. High scorers on Excitement-seeking crave stimulation, bright colours and noisy environments whilst low scorers feel little need for thrills. The active and exciting life of extraverts is reflected emotionally in the experience of Positive Emotions such as
joy, happiness, love and excitement. Low scorers are not necessarily unhappy, merely less exuberant and high-spirited. Research has shown that happiness and life satisfaction are related to both N and E, and that Positive Emotions is the facet of E most relevant to the prediction of happiness (Costa & McCrae, 1980).

Openness (O):
As a major dimension of personality, Openness to Experience is considerably less well known than N or E. Although its elements of active imagination, aesthetic sensitivity, attentiveness to inner feelings, preference for variety, intellectual curiosity and independence of judgement, have often played a role in theories and measures of personality, their coherence into a single domain has seldom been recognized (Costa & McCrae, 1992). Open individuals are curious about both their inner and outer worlds and their lives tend to be experientially richer. They are more unconventional, tend to question authority and are prepared to entertain new ethical, social and political ideas. They tend to display novel ideas and unconventional values, and experience the whole range of emotions more keenly than do closed persons. People scoring low on O tend to be conservative and conventional, preferring the familiar to the novel with somewhat muted emotional responses and a narrower scope and intensity of interests.

Alternative formulations of the FFM often label this factor as Intellect and O scores are modestly associated with both education and measured intelligence. Openness is especially related to aspects of intelligence such as divergent thinking that contributes to creativity. However, Costa and McCrae (1992) emphasize that O is not equivalent to intelligence, given that some very intelligent people are very closed and vice versa. Rather, they regard measures of cognitive ability to form a sixth independent factor that lies outside of the domain of personality altogether. Although O may sound healthier or more mature, its value clearly depends on the requirements of the situations and both open and closed individuals have a place in society (McCrae & Costa, 1992).

In terms of the six facets, Fantasy implies a vivid imagination and a tendency to elaborate daydreams, whilst Aesthetics refers to sensitivity to art and beauty. Openness to Feelings implies receptivity to one’s own inner feelings and emotions and an evaluation of emotion as an important part of life. Openness is seen behaviourally in the willingness to try different activities, go to new places or eat
unusual foods. Openness to *Ideas and Values* implies that these individuals are curious and value knowledge for its own sake.

**Agreeableness (A):**
Like Extraversion, *Agreeableness* is primarily a dimension of interpersonal tendencies, but whereas E is chiefly related to the preferred *quantity* of social stimulation, A represents the characteristic *quality* of interaction along a continuum from compassion to antagonism. Hence, the agreeable person is fundamentally altruistic, sympathetic and helpful and trusts others, whereas the disagreeable person tends to be egocentric, competitive and skeptical of others’ intentions. Just as neither end of the pole is intrinsically better, so neither is necessarily better in terms of the individual’s mental health. However, two pathological extremes are low A which is associated with Narcissistic, Antisocial and Paranoid Personality disorders, whereas high A is associated with Dependant personality disorder (Costa et al., 1991).

Of the six facets, *Trust* is the belief that others are honest and well intentioned whereas *Straightforwardness* refers to those who are frank, sincere and ingenious. A low scorer on this latter scale is more likely to stretch the truth or to be guarded about expressing his or her true feelings, rather than being dishonest. In particular, this scale should not be regarded as a lie scale. High scorers on the *Altruism* scale have an active concern for others’ welfare as shown in generosity, consideration and a willingness to assist those in need of help. Low scorers are somewhat more self-centered and reluctant to get involved in others’ problems. *Compliance* concerns characteristic reactions to interpersonal conflict with high scorers deferring to others, inhibiting aggression, forgetting and forgiving and showing a willingness to cooperate. *Modesty* refers to those who are humble and self-effacing although not necessarily lacking in self-confidence or self-esteem. A pathological lack of modesty is part of the clinical conception of Narcissism. *Tender-Mindedness* measures attitudes of sympathy and concern for others. High scorers are moved by others’ needs and emphasize the human side of social policies. Low scorers are more hardheaded and realistic (Costa et al., 1991).

**Conscientiousness (C):**
A great deal of personality theory, particularly psychodynamic theory concerns the control of impulses. During the course of development most persons learn how to manage their desires and the inability to resist impulses and temptation is generally a
sign of high N amongst adults. However, self-control can also refer to the more active process of planning, organizing and carrying out tasks and individual differences in this tendency are the basis of Conscientiousness.

Conscientiousness has also been described by some as Character or Will to Achieve and hence the conscientious person tends to be purposeful, strong-willed and determined. On the positive side, high C is associated with academic and occupational achievement whilst on the negative side it can lead to annoying fastidiousness, compulsive neatness or workaholic behaviour. High C scorers tend to be scrupulous, punctual and reliable whereas low scorers tend to be more lackadaisical in applying their moral principles and working towards their goals (McCrae & Costa, 1995).

The facet of Competence refers to the sense that one is capable, sensible and accomplished and is highly associated with self-esteem and locus of control. Whilst high scorers feel well prepared to deal with life, those on the low side have a lower opinion of their abilities and often feel inept and unprepared. High scorers on Order are neat, tidy and well organized, whereas low scorers are unable to get organized. Those high in Dutifulness adhere strictly to their ethical principles and scrupulously fulfill their moral obligations, low scorers are more causal in such matters and may be somewhat undependable and unreliable. Individuals scoring high on Achievement striving have high aspiration levels and work hard to achieve their goals. They are also diligent, purposeful and have a sense of direction in life. Very high scorers may invest too much in their careers and become workaholics. Low scorers are lackadaisical and even lazy and are not driven to succeed. Self-Discipline is the ability to begin tasks and carry them through to completion despite boredom and other distractions. Whereas they have the ability to motivate themselves to get the job done, low scorers procrastinate and are easily discouraged. Low self-discipline is easily confused with impulsiveness, although both are evidence of poor self-control, empirically they are distinct. Deliberation is the tendency to think carefully before acting. Thus, whilst high scorers are cautious and deliberate, low scorers tend to be hasty and act without considering the consequences, although at best they are spontaneous and able to make snap decisions (McCrae & Costa, 1995).

Costa and McCrae (1992) have operationalized their FFM in the form of the NEO-Personality Inventory (Revised) which will be described in more depth in chapter four detailing the empirical investigation of the study.
Although no IBS research has until now been done using the NEO-PI-R, the following section discusses the empirical evidence collected to date on personality traits in relation to irritable bowel syndrome.

4.2 The internal route of personality: stress and emotional dysfunction
As mentioned in the introductory section of this chapter, Friedman (1991) maintains that personality exerts a powerful influence on individuals and their state of health through two main paths, the internal and the external. This section 4.2 examines the internal route of personality in greater depth, starting with a broad orientation in section 4.2.1, a discussion of the empirical evidence linking stress and IBS in 4.2.2, an outline of the body of empirical research linking Neuroticism with illness and IBS in 4.2.3, and lastly, an examination of the empirical evidence linking a variety of other personality traits to different illnesses and IBS in 4.2.4.

4.2.1 Orientation
The internal or physiological route, refers mainly to the physiological actions and interactions that happen within the body when it is under stress and which in turn, shape individual functioning. As the topic of this section, the internal physiological route thus encompasses the crucial role that stress and emotional dysfunction play in regulating or deregulating our internal functioning and although the psychophysiological mechanisms are complex, there is no doubt that they exist and that they are important (Friedman, 1991).

The term “stress” is typically used to refer to adjustive demands placed on individuals as well as the individual's internal biological responses to such demands. Consequently, the severity of stress can be calculated by the degree of disruption it causes in individual functioning. The degree of disruption will in turn depend on various factors such as the characteristics of the stressor, the person's resources (both personal and circumstantial) as well as the interaction between the stressors and resources. With respect to the psychological level of the stress, the severity depends not only on the nature of the stressor and the individual's coping resources, but to a large extent on the individual's subjective perception and evaluation of the stress (Carson et al., 1988; Kaplan et al., 1994).

The significance of psychological disturbance as the result of emotional arousal or distress is virtually universal. Sweating, trembling, palpitations, rapid pulse, flushing,
nausea and diarrhea are only some of the reactions that reflect the powerful and immediate link between the mind and the body (Costa & McCrae, 1987). Apart from the physiological symptoms, there is also a large body of research that points to the various mental health outcomes associated with the psychosocial concomitants of stress and emotional turmoil. These mental health outcomes are often categorized under the broad trait domain of neuroticism and include an impressive range of indices of poor mental health and disturbed behaviour such as excessive anxiety, depression, some forms of criminality and drug addiction, sexual problems, poor body image, eating disorders and hypochondriasis (Deary & Matthews, 1993; Drossman, 1989; Walker et al., 1990). In addition, there is also a wide body of research linking a variety of personality traits such as introversion and extraversion, sensitivity, compulsiveness, humour, as well as age and gender to illness in general and particularly non-organic illness and to IBS.

However, given that the relations between psychological processes and physical outcomes are highly controversial, particularly with regard to personality and IBS, this section attempts to explore the empirical findings of the relevant psychological concomitants. The next section 4.2.2 discusses the empirical evidence linking stress with a variety of illnesses including IBS.

4.2.2 Empirical evidence linking stress with IBS

From a biological perspective, there is no doubt that psychological stress is closely linked to some illnesses. There are many sorts of evidence for this relationship, the most simple to observe being the immediate bodily “illness” responses such as fainting or nausea in response to the sight of blood or mutilation (Booth-Kewley & Friedman, 1987; Costa & McCrae, 1987). The role of stress in the onset and exacerbation of IBS symptoms has been demonstrated by many studies, the earliest being the work of Chaudhary and Truelove (1962), who revealed that 80% of a group of 130 patients related that daily stress influenced the onset and course of their IBS symptoms. The role of acute stress has also been associated with significant alterations in motor functioning within the gastrointestinal tract (Camilleri & Prather, 1992). Further support comes from a more recent survey conducted by Drossman et al. (1994) who found that 75% of their sample of 800 students and hospital staff members claimed that stress was associated with a change in their bowel habits. According to 85% of subjects identified in a community research study, stress was earmarked as the causal factor in changes in bowel habits, whilst a further 69% attributed their complaints of abdominal pain to stress (Drossman et al., 1982).
However, a more recent study by Whitehead (1992), proposes that the role of stress in IBS symptomatology is more moderate than originally believed.

In the attempt to assess the relationship between stress and IBS, one hypothesis is the possibility that IBS patients experienced higher levels of stressful events than either healthy control groups or patients suffering from other GI disorders such as ulcerative colitis. Typical stressors cited in such research include marital and sexual problems, family or business relationships, financial or occupational stress as well as fear of life-threatening diseases such as cancer (Chaudhary & Truelove, 1962; Ford et al., 1985; Fullwood & Drossman, 1995). Other relevant stress factors to have emerged included: the death of a parent before age 16 years; inconsistencies between parent and patient's socioeconomic status; divorce and remarriage, as well as changes in career where research data indicates that IBS patients report higher numbers of such stressful events than the other two groups (Bayne, 1997). In addition, a longitudinal study conducted by Waller and Misiewicz (1969) demonstrated that half of their samples under investigation attributed their physical symptoms to stress.

Pockroy (1997) notes that studies derived from clinics in the United Kingdom have shown registered IBS patients to have reported more life-threatening events in the 6-9 month period prior to their first clinic visit, when compared to other groups of patients suffering from organic diseases. Furthermore, a study investigating the relationship between life events, psychiatric illness and IBS found that life situations alone did not seem to be connected to gastrointestinal disorders unless they provoked an anxiety disorder (Ford et al., 1985). These authors confirm that their research data was consistent with the hypothesis that "IBS is a behavioral disorder, involving physiological responses to stress, which are expressed as somatic symptoms" (Ford et al., 1985, p.164). IBS patients were also shown to be more likely to demonstrate multiple somatic symptoms and to consult medical practitioners more often than the general population (Ford et al., 1985).

Independent studies undertaken by Whitehead et al. (1992) and Suls et al. (1994, in Pockroy, 1997), showed that subjects who demonstrated symptoms compatible with diagnoses of IBS also reported significantly higher levels of life event stress, when compared with asymptomatic controls. In these instances, neuroticism as a confounding variable had been statistically accounted for, indicating that between group differences could be attributed to other stress factors. Another aspect of this
particular study relates to laboratory findings suggesting that a greater increase in colon motility due to emotional arousal noted amongst IBS patients, permitted the prediction of a greater increase in bowel symptoms for each increment in stress in such patients (Mayer, 1997).

It has been established that IBS patients not only manifest symptoms characterizing gastrointestinal distress, but also demonstrate the autonomic arousal features commonly noted in anxiety and mood disorders, namely concentration problems; physical weakness and fatigue; lethargy; nervousness; anorexia; palpitations; dizziness; tremors; sleep disturbances, insomnia and sexual dysfunction (Christensen, 1992; Drossman, 1989; Guthrie et al., 1987; Walker et al., 1990). Additional stress and emotional dysfunction research (Bennett, 1989; Svedlund et al., 1984; Walker et al., 1990) further highlights this significant psychological component to illness by noting that IBS patients present with significantly raised levels of anxiety, depression and hypochondriasis when compared with the general population or controls suffering from other physical disorders. This psychological or emotional dimension will be examined in greater depth in the following section, which explores attempts to isolate a unique “IBS-type” personality profile.

4.2.3 Empirical evidence for an IBS type personality

Is there an IBS personality? Despite the waning in popularity of the assumption that specific constellations or personality profiles are associated with specific somatic disorders (Keltikangas-Jarvinen, 1989), most of the IBS personality research aimed at isolating a distinct type of IBS personality has proved to be confusing and contradictory. The following empirical data reviews much of this personality research.

West (1970, in Langeluddecke, 1985) was amongst some of the earliest researchers attempting to define a specific personality profile that would distinguish IBS patients from patients with ulcerative colitis, dermatological conditions, gastrointestinal disorders or muscle tension. Although the general profiles of these groups were similar, IBS patients showed the greatest degree of ‘psychological disturbance’. Research conducted by Tally et al. (1990) also isolated no distinct personality profile of IBS patients, whilst a later study conducted by Devroede (1989) reports finding a direct link between personality and defecation patterns when using the MMPI. This same author also found the personality profiles between those with severe chronic idiopathic constipation to be completely distinct from those of arthritic controls.
Various studies have described the personality of IBS patients as being compulsive, overly conscientious, dependant, sensitive, guilty and unassertive (Hill & Blendis, 1967; Langeluddecke, 1985). Whilst obsessive-compulsive features including orderliness, punctuality, conscientiousness, obstinacy, conformity and rigid moral standards have been revealed among patients with IBS, these findings have yet to be replicated (Latimer, 1983). After reviewing a variety of empirical studies, Greenberg and Bornstein (1988) concluded that a dependent personality orientation increases the risk for a variety of physical disorders. They also suggest that evidence indicates that dependant persons are more likely than independent people to view their problems in somatic terms and to seek professional help for physical symptoms. This finding was supported by Latimer (1983) who established that the personality trait of dependence tended to characterize patients with IBS.

A study performed by Langeluddecke (1983) using the Eysenck Personality Scales, showed IBS patients to be slightly more introverted than either general medical patients or healthy controls. This confirmed similar data reported by Esler and Goulston (1973) ten years earlier, where both diarrhea and constipation dominant groups of IBS patients displayed significantly higher levels of introversion than did the general medical patients and controls. Supportive data has also been published by Latimer (1981) who compared IBS patients with groups of healthy controls, as well as with subjects suffering from a neurotic disorder. These findings showed IBS patients as being more introverted than either of the other groups. However, contradictory research by Palmer and colleagues (1974) found IBS patients to have a similar degree of introversion as matched patients who had confirmed diagnoses of neurotic disorders.

In comparing levels of trait anxiety and neuroticism in patients with IBS, ulcerative colitis and general medical patients, researchers Esler and Goulston (1973) discovered that the IBS patients could be subdivided clinically into two groups. Those displaying abdominal pain as the predominant symptom as opposed to those with diarrhea as the predominant symptom. It was found that the two IBS groups differed from one another in terms of personality profiles in that the diarrhea predominant group was significantly more anxious and neurotic than the control population of general medical patients. However, patients with ulcerative colitis and patients with IBS who had predominantly abdominal pain, did not differ significantly from the control group in these dimensions of personality.
Although very often ambiguous, these studies began highlighting the tendency for IBS patients, or rather a select group of IBS patients, to experience emotional turmoil and distress. The next section 4.2.4 explores the empirical evidence linking IBS with Neuroticism and some of its various trait components such as anger, hostility and anxiety.

4.2.4 Empirical evidence linking Neuroticism and IBS

Perhaps because negative emotions are frequently expressed in physiological reactions, psychosomatic theories have often identified Neuroticism and its component traits (including anxiety, anger and depression) as causal influences on the development of disease and illness (Costa & McCrae, 1987). However, given that research around relations between psychological processes and physical outcomes remains highly controversial, it cannot be said that negative emotions lead directly and causally to the development of disease and illness. Rather, it is becoming increasingly recognized that this disposition is intimately linked to illness behaviour, somatic complaints, medical diagnosis and health habits (Booth-Kewley & Friedman, 1987; Costa & McCrae, 1987; Deary & Matthews, 1993).

Despite the view adopted in this study that the domain of Neuroticism is one of the five basic dimensions of normal personality that refers to the level of emotionality of persons (Costa & McCrae, 1987), there remains wide variation in understanding and consistent use of the term within both psychology and medicine. It would be a mistake to equate Neuroticism with psychopathology, since many psychiatric disorders involve defects in cognition, social bonding and reality orientation that are not elements of Neuroticism. However, historically the term is linked to the general category of psychiatric diagnoses labeled neuroses (Costa & McCrae, 1987; Deary & Matthews, 1993) and tends to be commonly equated with psychopathology and psychiatric conditions. In reviewing the substantial amount of literature written on the subject of IBS, a dominant theme involving IBS and psychopathology, or IBS and emotional distress emerges. In fact for many researchers, IBS is synonymous with some form of psychopathological and emotional dysfunction and their studies, which have highlighted this link, are worthy of consideration.

As early as 1962, Chaudhary and Truelove established that identifiable psychological factors were prevalent in 65% of the male and 86% of the female subjects in their study of 130 IBS patients. Generalized anxiety and obsessional worrying over trivial problems were the most predominant factors, playing a part either in the onset or
exacerbation of the condition. Almost ten years later, Hislop's (1971) research with IBS patients led him to conclude that IBS was the psychophysiological concomitant of an affective disorder. Following on their heels, IBS researchers Palmer et al. (1974) found that in comparison with the general population, the IBS patients presented with significantly higher rates of psychoneurotic symptoms such as free-floating anxiety, phobic anxiety, obsessional traits, somatic symptoms and depressive traits. An interesting observation of the study was the fact that the neurotic symptoms in IBS patients appeared to be unrelated to the chronicity or severity of bowel symptoms, raising the possibility that neurotic symptoms may be a more pervasive characteristic of IBS than actual bowel symptoms themselves.

Using the Minnesota Multiphasic Personality Inventory (MMPI), Welgan et al. (1985) found significant score elevations of IBS patients over controls on the hypochondriasis, hysteria and depression sub-scales and a significant elevation of scores of the controls over the IBS patients on the mania subscale. In addition, Whitehead et al. (1980) reported that patients with IBS scored significantly higher on all the global psychopathology scales of the Hopkins Symptom Checklist and on the sub-scales of somatization of affect, interpersonal sensitivity as well as depression, anxiety and hostility.

Anxiety and depression, followed closely by panic disorder appear to be some of the most commonly reported psychological disorders associated with IBS. In a discussion on studies demonstrating the comorbidity of psychological disorders in IBS, Fullwood and Drossman (1995) claim that between 93-94% of IBS patients show a lifetime history of psychiatric disorder, compared with only 21% of Inflammatory Bowel Disease (IBD) controls. Findings from a similar study comparing IBS and IBD patients conducted by Walker et al., (1990) revealed that significantly more IBS subjects had lifetime diagnoses of major depression, somatization disorder, generalized anxiety disorder, panic disorder and phobic disorder. IBS patients were also shown to have a significantly higher number of medically inexplicable somatic symptoms, even when gastrointestinal symptoms common to both groups were excluded. When comparing results between IBD and IBS patients, researchers Walker et al. (1990) found that 29% of the patients with IBS had a lifetime prevalence of panic disorder.

The results of a South African IBS project by Els, Gagliano et al. (1995) revealed that of the fifty-eight consecutive referrals with IBS from a university gastroenterology
clinic, 43 or 74% had at least one co-morbid psychiatric syndrome diagnosed on the basis of DSM-111-R criteria. Symptoms of anxiety or anxiety syndromes were present in 35 (60%) of the subjects, 24 (41%) of whom had current states of generalized anxiety disorder. In addition, 11 IBS patients (19%) had a current diagnosis and 14 (24%) had a lifetime diagnosis of panic disorder. A lifetime diagnosis of major depression was present in 19 (33%) of the subjects. Overall, 41 (71%) of the subjects had either anxiety or depression-related symptoms or both. Despite the lack of control group and the fact that the sample consisted of treatment-seeking patients in a tertiary care setting, this project is of interest as it represents one of the few South African IBS investigations.

Although a large majority of the research findings concur that patients with IBS present with a high incidence of psychopathology, the body of data that contradicts and challenges these conclusions cannot be ignored. In particular, the research conducted by Thornton et al. (1990) challenges the widely accepted claim that psychiatric dysfunction is evident in a large proportion of IBS patients. Although an exploratory project with a small, statistically inadequate sample of 25 patients with intractable IBS, the findings were interesting in that the majority of patients were not found to manifest elevated levels of anxiety nor was there any evidence of significant abnormal illness behaviour. A slightly later study by Talley, Kramlinger et al. (1993) sought to estimate the current and lifetime prevalence of psychiatric diagnoses, particularly, depressive, somatoform and panic disorders, in outpatients with IBS. It was hypothesized that psychiatric disorders would be more common in the IBS patients than in those patients with organic disease having similar symptoms. As hypothesized, current psychiatric disorders were reported significantly more frequently by IBS patients than by those in the control groups but the prevalence rates were considerably lower than in previously noted studies.

Although by no means an exhaustive list of the research conducted with IBS and psychopathology, the research reviewed thus far indicates that IBS is associated with higher levels of psychopathology and emotional dysfunction. A pertinent question however, relates to the fact that not all patients suffering from IBS report these elevated levels of psychopathology. Rather, it is only that select group of self-reporters who seek medical help for their symptoms as opposed to those who do not report or seek help. The contentious issue of self-selection was addressed by Welch et al. (1985), who sought to investigate psychoneurotic symptomatology in IBS, specifically testing the hypothesis that outpatients with IBS are a psychoneurotic
subgroup within the larger population of IBS sufferers. However, contrary to expectations, a group of psychiatric outpatients without IBS were found to have the highest levels of somatic distress. No significant differences were found between the two IBS groups and the normal control group.

Looking at the contradictory evidence presented either for or against an association of IBS and psychopathology, it is clear that the nature of the relationship is an elusive one. Although the majority of studies confirm associations between IBS and psychiatric disorders, methodological flaws have been identified in many studies, criteria-based diagnostic systems have not always been used and often reports have been anecdotal rather than scientific. This has made the comparison of studies very difficult. Moreover no one specific psychopathological disorder has been implicated with IBS, and no specific IBS personality profile has emerged. Rather, what seems to have been highlighted is the existence of a generic “disease-prone” or “distress-prone” personality that involves depression, anger and hostility, anxiety and possibly other aspects of personality.

4.2.5 Summary and conclusion
As the preceding empirical evidence has shown, although there may be no specific IBS type personality profile or pattern, it appears that a select group of IBS sufferers, those who report their symptoms and seek health care, are more inclined towards emotional distress and turmoil than those who do not report. This fits with the results from meta-analytic studies of Booth-Kewley and Friedman (1987) whose work with a variety of so-called psychosomatic illnesses such as headaches, asthma, arthritis and coronary heart disease are strongly suggestive of a generic “disease-prone” or “distress-prone” personality. According to Friedman (1991) the internal route of personality is one of the ways in which this emotional turmoil shapes individual functioning and determines health and illness. Although the mechanisms and processes are still unclear, it appears as if these IBS sufferers are not only exposed to more life-event stress, but also do not cope as well with it as others. Stressful events trigger continuous bodily arousal which can cause not only lasting changes in basic physiological processes but can also have mental and psychological effects. This process is especially likely to occur in the “distress-prone” personality.

The other major link between personality and illness and health is the external behavioural route, a connection that is equally as complex as the internal route. It seems obvious that people who are depressed, anxious, lonely, angry or otherwise
psychologically and emotionally disturbed are more likely to put themselves into unhealthy situations. In other words, one way that personality affects health is through behaviours that lead to more or less healthy habits and environments. This external route, which is just as important as the internal one is the topic of the next section 4.3.

4.3 The external route of personality: health and health behaviour
This section explores the external or behavioural route through which personality can influence individual functioning. It commences with a brief overview of the concept of the healthy personality in section 4.3.1, followed by an explanation of health and health behaviours in 4.3.2, a look at pathogenic and salutogenic perspectives on health and illness in 4.3.3, the concepts of risk, vulnerability and prevention in 4.3.4, mediating factors in 4.3.5, health practices in 4.3.6 and lastly a summary and conclusion in 4.3.7.

4.3.1 The healthy personality
Individual differences regarding health and disease are well documented and continue to astound medical practitioners (Friedman, 1991). Even when obvious individual differences such as smoking or stress are accounted for, it nevertheless appears that certain people possess some component that protects their health. This concept of a protective mechanism in terms of health has its roots in ancient times, whereas scientific evidence of the role of personality in maintaining health has emerged only in the last few decades.

As many people have not yet made the 'paradigm shift' and are still used to thinking of the mind and body as separate entities, the role of personality has largely been ignored in health care and many persons still show enormous resistance to the idea that by actively working on their psychological make-up, they will be able to improve the status of their physical health and wellbeing (Friedman, 1991). Another significant reason that personality is sidelined is that a psychosocial approach has not fitted with the traditional biomedical model of disease, meaning that health promotion in general and the psychological and behavioural aspects of health care have been poorly attended to and undercompensated for. However, with the shift towards more holistic health care approaches this is gradually changing, and the role of personality, both internal and behaviorally is receiving increasing recognition. The behavioral route, particularly the role of health behaviours is the subject of the following section.
4.3.2 Health and health behaviours

Nothing gives rise to more human suffering than the loss of one's health. Although medicine has significantly enhanced the overall quality of life through the effective prevention and treatment of infectious diseases, the *health of most westernized and industrialized nations is still being compromised*, this time by a *new generation of health problems*, ones that are *embedded in personal lifestyles and habits of living* (Matarazzo, 1980). In the light of this, recent research indicates that *50% of contemporary mortality, morbidity and suffering can now be attributed* to the slow-acting insidious and *chronic diseases* such as cancer, arthritis, rheumatism, diabetes, heart disease and the functional gastrointestinal disorders.

However, whilst chronic illness is on the rise, economic and epidemiological data indicate that *health care* in most western and industrialized nations is still *based primarily on treating acute, well-advanced and often terminal disease processes*, often in hospitals and mostly using an infectious disease paradigm. Furthermore, it appears that *less than 3% of health care funds are spent on disease prevention and health education activities* (Alcorn, 1991). This is despite the fact that as discussed in chapter two, it is becoming increasingly apparent that the *'causes' of poor health and chronic disease processes* are no longer associated with a single infectious microbe, but are instead *linked to a multiplicity of factors*, particularly behavioural and cognitive habits (Thorensen, 1984; Thorensen & Eagleston, 1985).

Accordingly, Matarazzo (1984, in Thorensen & Eagleston, 1985) reminds us of the historical wisdom of earlier philosophers and physicians regarding *connections between health and habits*. He argues that "*behavioural pathogens*, that is, high risk behaviour and actions that are *harmful to health*, such as excessive alcohol drinking, chronic distress, cigarette smoking and overeating, have been *sorely neglected* compared to microbial pathogens. However, emerging research indicates that many common diseases and illnesses can be prevented and that others can be postponed and well-controlled, simply by making positive lifestyle changes. For this reason, intensifying research in this area and encouraging persons to make health enhancing behaviours a part of their daily lives is gaining momentum in efforts to conquer disease and illness and contribute towards overall quality of life in the long term.

The following section 4.3.3 examines both the traditional pathogenic and emerging salutogenic perspectives on health and illness and considers rapprochement between them.
4.3.3. Integrating the pathogenic and salutogenic approaches

The salutogenic orientation is a relatively new theoretical perspective explaining health, illness and human behaviour that has arisen to supplement the traditional pathogenic perspective. The term 'salutogenesis' has its origins in the Latin word 'salus' meaning 'health', and the Greek word 'genesis', meaning 'origins'. The emphasis of this approach thus falls on the origins of health or wellness (Strumpfer, 1990). Thinking that relates only to pathological explanations for disease precludes other theoretical alternatives to the question of health, illness and human behaviour associated with these. In contrast, the salutogenic orientation reflects a paradigm shift in terms of theory and research, by offering the opinion that illness and stress are normal phenomena of modern life.

According to Antonovsky (1987), the more traditional perspectives advocate a health-disease continuum concept, with the extreme dimensions representing either a perfect health or wellness pole, or a terminal illness or death pole. In terms of the former, the core assumption underlying this position is that 'prevention is better than cure', thus hypothesizing that the ultimate focus of clinicians should be the allocation of various resources to maintain health at all costs. Conversely, at the other end of the continuum, lies the perspective proposing treatment for the ill, the prevention of death and chronicity and the restoration of health, if at all possible.

The pathogenic approach is primarily concerned with why people become ill, why they develop particular disease entities and how these diseases can be prevented and combated. The core assumption of the pathogenic paradigm emphasizes the view that the etiology of disease or illness is multifactorially determined, so indicating that physical, biochemical, microbiological and psychosocial agents are believed to be risk factors with respect to development and progression of disease (Strumpfer, 1990). A core concept of the pathogenic orientation is the notion of homeostasis (Cannon, 1939, in Strumpfer, 1990), which implies that the human organism's natural state tends to be a relatively constant condition. Some variation in this state may occur, but this is regulated by interactory maintenance mechanisms. Central to the pathogenic position is the view that the homeostatic state of balance is disrupted by pathogens and/or stressors, which place the whole system in jeopardy. Should the regulatory mechanism fail to adequately restore balance then illness can arise (Strumpfer, 1990).
The core assumption of the salutogenic paradigm is based on heterostasis, disorder and pressure towards increasing entropy. This seems to indicate that as a rule, illness or disease is a very common phenomenon of human existence and that not only are stressors omnipresent in human life but that the human condition itself is stressful (Antonovsky, 1987). In view of this, it is thus not surprising that many people contract and develop serious physical disease or illness, as all are the focus of stress and pressure, and all are at the mercy of pathogenic agents. Instead, what is surprising, marvels Antonovsky (1979, in Strumpfer, 1990), is the fact that many people are well, healthy and functioning in effective ways!

There are various implications inherent in the salutogenic way of thinking. The first concerns the rejection of the disease-health continuum in favour of a "health-ease/dis-ease" continuum. This means that society as a whole becomes the focus of clinical attention and each individual or group is evaluated in accordance with clinical contributions aimed at moving people in the direction of the wellness pole (Strumpfer, 1990). The second implication is the rejection of the common view that stressors are "inherently bad", in favour of the opinion that stressors may in fact have "salutary consequences" (Antonovsky, 1979, in Strumpfer, 1990). Underlying this premise is the belief that although most persons are confronted with stress on a daily basis and that many deal with an overload of stress in their lives, nevertheless, most people continue to cope relatively well and their position on the "health-ease/dis-ease" continuum remains relatively stable. Alternatively, some people may move even closer to the wellness pole revealing that their responses to stress are positive and even health-enhancing (Strumpfer, 1990).

This implies that stressors are essentially neutral in terms of their health consequences, which therefore depend largely on the individual's response to the stressor. The salutogenic paradigm posits that individuals, in order to live well and healthy lives, can and must learn to adapt to living with continuously stressful circumstances by turning potentially harmful stressors to their own advantage (Antonovsky, 1987). The final implication of the salutogenic perspective is that the focus of research shifts to those persons who despite genetic predispositions, disturbed environmental circumstances or unhealthy lifestyles, do not develop pathology and illness (Antonovsky, 1987).

In conclusion, it is important to stress that acceptance of the salutogenic orientation does not imply that the pathogenic one should be abandoned, as these two
theoretical approaches are potentially complementary. The promise of the former approach however, is that it makes provision for new insights, growth and greater integration at a higher level (Strumpfer, 1990).

4.3.4 Risk, vulnerability and prevention
The new discipline of *prevention science* that has arisen at the interface of many disciplines, is aimed at *preventing or moderating human dysfunction* and *improving functioning and quality of life* (Coie et al., 1993). As preventative efforts occur by definition before illness is fully manifested, they are focused primarily on the systematic study of potential precursors of dysfunction or health called risk factors and protective factors respectively. Essentially preventative interventions aim to *counteract risk factors* and to *reinforce protective factors* in an attempt to disrupt dysfunctional processes (Coie et al., 1993).

Specific forms of dysfunction are typically associated with *many different risk factors* rather than with a single risk factor. By the same token, a *specific risk factor is rarely specific to a single disorder*, as pathogens tend to spread their effects over a number of adaptive functions in the course of development. *Exposure to risk may thus occur in diverse ways in numerous settings with overall risk resulting from the interaction of personal dispositions and environmental risk factors.* Furthermore, it is clear that the *salience of risk factors may fluctuate developmentally; that exposure to too many risk factors has cumulative effects; that diverse disorders share fundamental risk factors and that promoting protective factors against dysfunction can be mitigated by a variety of individual and social characteristics* that serve protective functions (Coie et al., 1993).

Based on the *interactionist perspective* discussed earlier in the chapter, human adaptation is best understood in terms of the *mutual interaction* between the *person* and the *situation*. The *ecosystemic perspective* adds the importance of context and stresses that *human behaviour unfolds in the context of multiple systems of influence* that may have varying impact at different points of development. The role of *timing* suggests that biological and sociological mechanisms have differing impacts at various points in development. Given that human development and adaptation is never static, models of explanation and prediction should therefore incorporate *dynamic developmental processes* in predictors, outcomes and mediators, and allow for numerous points of vulnerability throughout the life cycle. In addition, as *transactions* between individuals and their environments are necessarily complex
and multicausal, the focus of prevention should be to alter risk factors or mediating processes in such a way as to reduce maladaptation or risk and enhance protective factors.

Various models have been proposed to attempt to understand and trace these complex linkages between person and situation and health and illness.

As illustrated in Fig 4.2, Adler and Matthews (1994) suggest two broad domains of variables leading to improvement or deterioration in health; those residing in the social environment and those residing within the individual.

![Diagram of the link between personality, situation and health and illness (Adler & Matthews, 1994)](image)

The double-headed arrow between the two domains signifies the importance of the person-environment interaction. For example, personality dispositions may predispose individuals to be susceptible to specific environmental elicitors of clinical episodes or dispositions may affect the likelihood that individuals will be exposed to situations to which they are vulnerable. Variables in the environmental and individual domains may affect disease onset through physiological mechanisms and/or through health behaviours that in turn affect these mechanisms. Clearly the interaction between environmental factors, individual dispositions and health behaviours is a complex one and the mechanisms little known and understood.
A second viable linkage model has been outlined by Maddi (1990), who proposes that certain factors influence well-being, as outlined in Fig. 4.3.

Fig. 4.3 Factors influencing well-being (Maddi, 1990)

Maddi (1990) proposes that several vulnerability and resistance factors play a role in the so-called stress-related disorders. The rubric of stress (referring alternatively to events, appraisals of events, coping efforts based on appraisals and emotional distress reactions to all these) lead to a prolonged strain reaction that in turn constitutes vulnerability to wellness breakdown. The breakdown probably takes place along the lines of the weakest links in the organisms and hence constitutional predispositions are regarded to be a moderating factor between stress and illness, determining what amount and quality of strain will debilitate. Other moderating factors that have been proposed and studied qualify as buffers or resistance resources against illness and stress and include health practices, coping, personality dispositions and social support.

Given the strong link between IBS and stress as already outlined in this chapter, it is pertinent to consider these factors in the attempt to understand the complex relationships between stress, personality, IBS and health behaviours. As personality
dispositions have been discussed in the previous section, coping, social support and health practices will be outlined in more detail in section 4.3.5.

4.3.5 Mediating factors
Given the complexity of illness and the modest degree to which stressful events influence it, it is only through studying the interaction of moderating and mediating factors such as social support, coping, self-efficacy and the sociocultural context, that we can hope to understand more fully, the manner in which health is preserved or jeopardized.

4.3.5.1 Social support
The social context of the individual has a profound impact on the individual’s health and well being. The process by which the social context influences the individual has been termed “social support” defined as resources provided by other persons (Rodin & Salovey, 1989).

Although it is well documented that physical and psychological illnesses are more prevalent in communities in which social ties and networks are disrupted by changes in employment patterns, migration, aging and death, research findings concerning social support have nevertheless been inconsistent (Maddi, 1990; Rodin & Salovey, 1989). Some have indicated protection against illness independently of stress, some have showed a more clear buffering effect, whilst others have showed no effect at all. According to Maddi (1990), such inconsistency is not surprising given the conceptual ambiguities and plethora of measurement approaches surrounding the concept. However, despite these inconsistencies it appears that social support does seem to emerge on balance as a buffer in the stress-illness relationship, whether it is actual social resources or perceived social resources that is emphasized. This does not mean that all sorts of support from others have identical effects as Maddi (1990) refers to research showing that a particular sort of social support actually has a negative effect on health.

In general, social support provides relief from psychological distress during crises. By being integrated into a social network, individuals may experience greater positive affect, higher self-esteem or feel more in control of environmental changes. Each of these cognitive factors might then protect the person from physical illness through a variety of physiological mechanisms or by encouraging the person to make healthy
life-style changes (Rodin & Salovey, 1989). At a more general level, social support via an integrated social network may have direct effects on health by providing the person with a predictable set of role relationships, a positive social identity and experience of mastery and control (Thoits, 1983, in Rodin & Salovey, 1989).

Social support could also play a role in buffering the impact of negative events and other stressors by eliminating or reducing the stressor itself, bolstering the ability of the person to cope with the stressor or by attenuating the experience of distress after it has already been triggered (Cohen & McKay, in Rodin & Salovey, 1989). Direct effects are more likely to be obtained when support is defined as the degree to which a person is integrated into social networks; buffering effects are typically discovered when support is operationalized as the social resources available to one undergoing stressful events. Lastly, one of the reasons why the relationship between social support and health may be complicated is that those in greatest need of support from others may be least able to obtain it. Those persons with severe health problems, because they increase others' sense of vulnerability, may be seen as threatening.

According to Adler and Matthews (1994), social support's impact on health-related behaviours can occur in several ways. In so far as individuals use health-damaging behaviours to cope with stress, and social support reduces the adverse effects of stress, individuals with more support in the context of stressful experiences may be less likely to engage in health-damaging behaviours. This is supported by Jennison (1992, in Adler & Matthews, 1994) who found that more losses were associated with greater excess use of alcohol. Social support buffered the effects of loss and the relationship of loss to drinking was reduced for those with more support. Social connections can also provide specific support for engaging in health-promoting behaviours. Aaronson et al., (1989, in Adler & Matthews, 1994) found that persons who report receiving more support for health-related behaviours such as exercising, avoiding alcohol or cigarettes whilst pregnant, are more likely to engage in those behaviours.

4.3.5.2 Coping

In recent years, individual coping styles have become of increasing importance in understanding effective human functioning and health. Effective coping may play an important role in health promotion, disease prevention and more rapid recovery from illness. How individuals cope with stress is an important mediator of the stress-illness relationship. Lazarus (1990) defines coping as the constantly changing cognitive and
behavioural efforts to manage both internal and external demands that are appraised as taxing or exceeding the resources of the person. This definition implies a more or less reciprocal relation between life stress and coping, as when coping is inept or inadequate, there is apt to be more stress, both in frequency and degree, than when coping is effective. As Lazarus (1990) emphasizes, it is not stress per se that is important in adaptational outcomes, but rather the way we cope with it.

There are various perspectives relating to coping techniques that may be used by persons when under stress. One approach focuses on the nature of the characteristics of each stressful event and assumes that persons who are repeatedly confronted by stressful circumstances become overwhelmed and susceptible to helplessness, passivity and even demoralization (Mayer, 1997). Another school proposes that certain personality traits such as mastery and self-esteem predispose persons to more effective coping than others. A third alternative incorporates personality characteristics that are antecedents of coping such as ‘hardiness’, ‘fatalism’ and ‘inflexibility’. This latter view assumes that certain personality characteristics predispose individuals to cope in ways that either facilitate or impair their adaptational abilities. While this is a valid hypothesis, Mayer (1997) claims that there is little data to support it.

A number of investigators have been concerned with the classification of coping responses. Moos and Billings (1982, in Rodin & Salovey, 1989) suggest three primary coping domains can be identified in the literature on coping. The first, appraisal-focused coping, are attempts to define the meaning of a situation; the second, problem-focused-coping, refer to attempts to modify or eliminate the source of stress and lastly, emotion-focused coping involves managing emotions aroused by stressors and trying to maintain effective equilibrium. More recently, coping responses have been classified as avoidant or nonavoidant (Suls & Fletcher, 1985 in Rodin & Salovey, 1989). However, others (Stone et al., 1989, in Rodin & Salovey, 1989) regard the current classification schemes of coping to be an oversimplification and instead suggest grouping coping strategies in terms of several general themes. These include seeking social support, seeking information, religiosity, situational redefinition, behavioural and cognitive avoidance, tension reduction and problem solving.

According to Cohen (1984, in Rodin & Salovey, 1989) coping can influence hormone levels, cause direct tissue changes or affect the immune system. Interpersonal
coping styles tend to influence the type of care received such that demanding task-oriented patients may have their complaints acted on more quickly. Positive coping, including strong feelings of a “will to live” and high morale may also have positive physiological consequences. Cohen and Lazarus (Lazarus, 1990) found effective coping to be linked to quicker recovery from illness with active participant strategies being especially effective. However, other data has revealed that sustained emotional reaction can be connected to chronic disruptions in physiological functioning, which in turn suggests an underlying link with a variety of physical disorders, including IBS (Weiss & English, 1949, in Pockroy, 1997).

A wide range of research sources implicates the role of stress and coping styles in psychosomatic complaints, illnesses and diseases (Mayer, 1997). As noted earlier in the chapter section discussing IBS, many IBS sufferers fail to identify the role played by psychological factors in their disorder. Instead, they are consumed by the manifestation of physiological symptoms and feel compelled to seek only an organic explanation for their distress and discomfort. Emotions such as fear, resentment, anger, guilt or embarrassment were shown to elicit observable physiological responses (Pockroy, 1997).

Results obtained from recent research (Drossman et al., 1988) on IBS sufferers indicates that as a group, IBS patients appear unable to confront or cope with stress effectively, which facilitates the emergence of behaviours aimed at consciously avoiding or escaping their difficulties. Moreover, it is hypothesized by Mayer (1997) that such stress becomes internalized on a subconscious level, becoming overtly expressed as a physical disorder via the gastrointestinal system, potentially resulting in the development of IBS. With respect to Mayer’s (1997) study, the group of IBS patients used interacted negatively with their environment. Furthermore, due to their different ways of perceiving stress, their less than adequate coping skills and the use of unhealthy and rigid coping styles simply serves to exacerbate their stress levels and hence their disorder.

According to results of Mayer’s study (1997) concerning coping styles, only the scores on the Escape-Avoidance subscale of the Ways Of Coping Questionnaire demonstrated any difference between the IBS group and the control group. The use of Escape-Avoidance is a behavioural strategy designed to deal with high levels of stress encountered by those whose choice of this style of coping reflects the need to avoid threatening information and the tendency to block unpleasant experiences from
consciousness. This in turn results in self-deception and the distortion of reality as the person tries to make life less unpleasant and distressing (Mayer, 1997).

4.3.5.3 Self control and self-efficacy
Many believe that the concept of self and psychological resources of the self are central to the understanding of health and illness. Various research studies have been conducted on the influence of self-esteem with regard to effective coping. DeLongis and colleagues (1988, in Mayer, 1997) assessed the effects of self-esteem and emotional support on coping and found that individuals who view themselves in a positive light were less likely to be overwhelmed in stressful situations based on their confidence in their own ability to cope with an array of difficulties. In addition, Pearlin et al. (1981, in Mayer, 1997) in a comparative study investigating depression as a consequence of job loss, reported that lower levels of depression were exhibited in subjects who had high self-esteem, as compared to those in the low self-esteem group.

Furthermore, researchers have concluded that individuals appear to have not one, but several views of their selves, encompassing many domains of life such as scholastic ability, physical appearance and romantic appeal, job competence, as well as adequacy as a provider (Basic Behavioral Task Force, 1996). In line with this, other research findings have refuted the idea that a person's level of self-esteem remains stable throughout life, indicating that in many persons self-esteem changes dramatically over time, particularly in response to the impact of major transitions and stressful life-events. Low self-esteem plays an important role in mental illness and research in this area is beginning to explain interpersonal factors that lead people to devalue themselves, to become depressed and to even consider suicide. Such factors include assessments of physical appearance, behaviour of parents and other caregivers as well as school environments (Basic Behavioral Task Force, 1996).

Control, or perceived mastery over one's circumstances can be thought of as a basic human motivation and the presence or absence of a sense of control has a profound influence on individuals' emotional, cognitive and physical well-being (Rodin & Salovey, 1989). Furthermore, the adoption of preventive action is assumed to be influenced by the degree to which the individual values health and the degree to which a person expects that behaviour (internal locus of control) will influence health outcomes. In this regard, Kirscht (1972, in Nemcek, 1990) studied the relationship between locus of control, perceived susceptibility to illness and benefits of preventive
Internally controlled respondents viewed themselves as less susceptible to illness and identified preventive measures as more beneficial than did externally controlled persons. Perceptions of control also correlated with age and gender, with women believing that they had more control over their health than did men and younger persons believing that they had more control over their own health than did older persons (Nemcek, 1990).

Lastly, various investigations have reported that individuals with an internal locus of control possess more health/illness related information, learn more efficient problem-solving strategies, take more preventative steps and are more healthy than persons with an external locus of control (Seeman & Seeman, 1983, in Lemos-Giraldez & Fidalgo-Aliste, 1997). Furthermore, individuals with an internal locus of control who have suffered from strokes and other life-threatening illnesses are also attributed better compliance with prescribed therapies, a higher adaptation to the illness and less frequent depressive reactions (Lefcourt & Davidson-Katz, 1991 in Lemos-Giraldez & Fidalgo-Aliste, 1997). These authors posit that an internal locus of control affects one's health in several ways. Internal individuals are more attentive to what happens around them and are not only more likely to perceive threats, but perceive them as challenges rather than hopeless situations. They also try to solve the problems inherent in threatening situations instead of dwelling on their own emotional reactions. Furthermore, their responses to stress tend to be more flexible. Whereas externality is associated with anxiety and depression, internality is associated with strength, humour and happiness (Lemos-Giraldez & Fidalgo-Aliste, 1997).

4.3.5.4 Sociocultural context

Age, gender, socioeconomic status and education are important variables that have until recently, been largely ignored in health psychology. However, according to Revenson (1990), these demographic markers may be proxy variables denoting health promoting or health damaging psychological processes or may suggest moderator variables.

Ratcliff-Crain and Baum (1990) suggest that both physiological and social components of 'gender' have the potential to affect health. In terms of physiological differences, although both sexes show the same basic systemic perturbations, the variation in stress responses appear to be a matter of magnitude rather than quality, with men responding more strongly during stress than women and displaying greater blood pressure responses. However, only some aspects of stress responses show
clear differences between the sexes, which seem to be limited to acute stress responding. Furthermore, coping with stressors does not appear to vary systematically with gender and further evidence is required to judge whether reproductive hormones are related to differences in reactivity (Ratcliff-Crain & Baum, 1990). According to Rodin and Salovey (1989), women are on the average significantly less vulnerable than men to most life-threatening diseases. The occupational experience of men and women in similarly responsible and demanding positions appears to reduce the mortality advantage of women, suggesting that variables unrelated to sex-specific hormones may be contributing to overall mortality variances.

In many western countries, males tend to engage in more risky behaviours than females, particularly those involving physically daring or illegal activities, thus influencing health (Waldron, 1986, in Rodin & Salovey, 1989). Women also visit physicians more than men in western countries due to more self-reported symptoms, poorer self-rated health and because they have greater faith than men in the value of preventive medical care. There is also evidence that women are treated differently in the health-care system, obtaining less adequate medical care than men, reflecting sex discrimination and other general sex role differences (Cleary et al., 1982, in Rodin & Salovey, 1989).

In terms of age, Rodin and Salovey (1989) point out that physical health of the aged population reflects both normal biological changes and increased incidence of many major diseases. However it makes sense that many of the chronic conditions experienced by the elderly result in part from the life-styles and health practices of their youth (Siegler & Costa, 1985, in Rodin & Salovey, 1989). In understanding the effects of age as a variable on health, it is extremely important to note that all data suggests greater interindividual variability with aging; that some changes in aging are related to psychosocial factors and that the outcome of aging is not always decline. Some researchers (Kasl & Beckman, 1981 in Rodin & Salovey, 1989) suggest that the relations between an individual's health and the effects of psychosocial variables might grow stronger in old age. There has also been substantial attention to changes in social support that occur with aging that may influence health and well-being such as bereavement, relocation and the use of health services. In terms of the latter it has been found that widowed persons consult doctors more often than married persons. However, other research shows that older adults show better rates than younger people of commonly acceptable favourable health practices such as abstinence from
alcohol and cigarette smoking, suggesting that they are more adherent to health-promoting regimens (Besdine, 1981, in Rodin & Salovey, 1989). The age of the patient can also influence clinical decisions that affect treatment, with older persons being more likely to be given a poor prognosis for recovery and more likely to be given palliative rather than intervention treatments. There is also evidence that older people seem to be less likely to challenge their doctors and more likely to adopt a passive role in health care (Rodin & Salovey, 1989).

According to Taylor et al. (1997), socioeconomic status (SES) and race heavily determine the more proximal environments in which people live, such as neighbourhood and work, and hence provide important contexts for understanding certain features in these environments that may compromise health. SES is traditionally measured by education, income and occupation and demonstrates greater negative health outcomes as one moves lower on the SES gradient. SES is related to higher prevalence and incidence of most chronic and infectious disorders and to higher rates of nearly all major causes of morbidity and mortality across populations across time (Williams & Collins, 1985, in Taylor et al., 1997). Substantial race differences also exist in health with African-Americans worse off than Whites on virtually every major index of health status. Socioeconomic differences account substantially for these health status differences, in as much as approximately one third of the African-American population in the USA lives in poverty, compared with 11% of the White population. Although SES and race are not themselves environments, they provide an important and often overlooked context for understanding the immediate environments in which people live and work and are often linked to factors like high density and overcrowding, isolation, homicide and suicide, high noise levels as well as crime, delinquency and child abuse, factors that all impact negatively on health and well-being (Taylor et al., 1997).

Given the complexity of the interactions between the biological, psychological, social and environmental domains, greater knowledge and understanding of such mediating factors such as social support, coping, self-control and the sociocultural milieu, becomes a necessary part of care-givers efforts to enhance awareness and strengthen individual functioning in the face of stress. The next section 4.3.6 examines health practices as part of the external route to personality that influences health and illness.
4.3.6 Health practices
The beliefs and attributions that people hold can influence their health by affecting their behaviour, or more directly by affecting a physiological system. These two modes of influence are not mutually exclusive. Furthermore, a person's health may also be significantly influenced by health professionals involved in their care through the thinking imparted and the methods of treatment used. As Marteu (1989) points out, while there is general agreement amongst psychologists that health beliefs and attributions are important in explaining and predicting health behaviours and health outcomes, there is less agreement about which beliefs and attributions are important, and much of the variance in outcome they predict.

Many different beliefs and attributions have been considered as pre-cursors to health-related behaviours. General as well as health specific cognitions are derived from various theoretical models and have been used to predict behaviour in the face of a health threat as well as in response to an illness or its treatment.

4.3.6.1 Health behaviours
Vickers et al. (1990) define health behaviours as actions undertaken to maintain or improve health. In this regard, it is widely recognized that illness and mortality are linked to individual behaviour. Factors such as smoking, excessive alcohol intake, reckless driving and failure to use seat belts among others have demonstrably negative effects on health status and longevity. Other health practices such as sleep patterns, physical activity and regularity of meals are believed to be important, but evidence of health effects is more equivocal (Belloc & Breslow, 1972; Mechanic & Cleary, 1980). Thus, given that what people actually do to prevent illness and protect their health is still largely terra incognita, there is common agreement amongst investigators in the field that more research is required and greater specificity in terms of both theoretical and methodological issues linked to such research (Harris & Guten, 1979; Van Heck, 1997).

Belloc and Breslow (1972) related an index of common health practices including hours of sleep, physical activity, meal regularity, smoking and drinking to health status and found large and cumulative effects of prudent health practices. Health practices also had a significant inverse relationship with mortality independent of income and physical health status. In their research, Mechanic and Cleary (1980) found that the variables most substantially related to positive health behaviours are being female and having more education. Moreover, persons reporting low positive
health behaviours also assess their health less favourably. There is also evidence that positive health behaviours appear to be learned within the family context and reflects in part, parental concern with health and worry about the child's health. These authors also found that both psychological well being and subjective health status are linked with positive health behaviours (Mechanic & Cleary, 1980).

Persons reporting poorer health are less likely to use seat belts, more likely to smoke and seek less preventive care, as well as being less physically active and exercising less (Harris & Guten, 1979). These same authors found that practically everyone in their study performs at least some regular, routine health protective behaviours, and that most people perform many or a wide range of these behaviours. Activity concerning nutrition and eating habits is the most common health protective behaviour identified in their sample. Other common health protective behaviours were rest and relaxation, physical activity and other personal health practices; contact with the professional health care system, preventive health care, environmental hazard avoidance and harmful substance avoidance.

Taylor et al. (1997) suggest that the social environment also serves as a source of learning and reinforcement for attitudes and behaviours that affect health. People who are more socially integrated exhibit greater preventive health behaviour, including less smoking and drinking and more cancer screening as well as more successful risk reduction efforts such as reducing dietary fat, exercising and stopping smoking (Broman, 1992, in Taylor et al., 1997). Furthermore, community characteristics influence the degree to which certain health habits may be practiced. Because poorer neighborhoods have fewer facilities and resources, the adoption of public health recommendations such as obtaining a healthy diet and regular exercise cannot always be met (Evans, 1997).

There is also evidence that health habits are adversely affected by job stress and as such may also play a moderating role in the relationship between work stress and adverse health outcomes (Taylor et al., 1997). People who feel that they have more control over work are less likely to engage in risky health behaviours. It has been found that drug abuse is higher in individuals with high strain jobs and that although job strain does not necessarily lead people to start smoking, it does tend to lead to heavier smoking (Taylor et al., 1997).
It appears from these data that positive health behaviour is part of a wider life orientation including a sense of psychological and physical well being and a sense of harmony with the dominant social milieu. This is consistent with Abel's (1991) assertion that health behaviours are one aspect of the broader concept of lifestyle, that includes both health related behaviours as well as attitudes. Greater understanding of both attitudes to health and behaviours arising out of these attitudes can only enhance our understanding of the mind-body links, particularly in still relatively unexplored areas of the functional disorders like irritable bowel syndrome. The following section introduces two models; a model of health attitudes and beliefs, and a proposed model of health behaviours, as a way of clarifying possible pathways for creating positive changes in these areas.

4.3.6.2 Models of health behaviour

The Health Belief Model is the most widely applied explanatory model in preventive health behaviour research to date (Nemcek, 1990). Prior to its development, literature relevant to preventive and compliance behaviours consisted of an unsystematic multiplicity of variables, not linked in any coherent conceptual way. The Health Belief Model is a theoretical structure developed to explain why and under what conditions people will take preventive actions. According to the model illustrated in Fig. 3.4, seven primary variables influence a person's choice. The four variables, perceived susceptibility, seriousness, benefits and barriers formed part of the original model first developed in the 1960's by Rosenstock and associates. The fifth variable, health motivation was introduced during the 1970's, followed by the sixth and seventh variables, perceived control and health value in the 1980's by Becker and his associates (Harris & Guten, 1979; Nemcek, 1990).
In a nutshell, the model claims that when barriers to engaging in prevention are minimal and other disease specific health beliefs are strong, a person can be expected to engage in prevention. When the reverse exists preventive actions are unlikely (Nemcek, 1990). Perceptions directly affect the likelihood of taking preventive actions and these perceptions are indirectly affected by diverse demographic, structural and sociopsychological variables (Harris & Guten, 1979).

As currently formulated, the Health Belief Model views health-related behaviours as likely to be performed by persons who firstly, are motivated to perform them in that they express concern about health matters in general, are willing to attend and
comply with medical direction and already engage in positive health activities. Secondly, by those who perceive a value to reducing threat of disease in that they perceive themselves susceptible to a given disease as affecting them physically or socially or currently perceive symptoms of a disease. Thirdly, by those who believe that health action will reduce this threat and fourthly, all the above factors will be modified by a set of demographic, structural and enabling factors (Harris & Guten, 1979).

Vickers et al. (1990) point out that rather than being independent, health behaviours occur in clusters or dimensions with the number ranging from between two to six. Whilst it is reasonable to regard the presence of multiple categories of health behaviours as well established, there is presently no consensus regarding the number nor precise content of the categories required to describe these behaviours. Vickers and Hervig (1984, in Booth-Kewley & Vickers, 1994) reviewed past research on health behaviours and selected a sample of 29 behaviours for study, which provided markers for the dimensions, identified in previous studies. They found that even with a dichotomous response format, previously identified health behaviour dimensions could be replicated when behaviours were appropriately sampled. The four dimensions they identified were Wellness Behaviours, Accident Control, Traffic Risk Taking and Substance Risk Taking. This four-dimension model was tested in a second study (Vickers et al., 1990) that applied numerous tests of factor replication in two large samples of military personnel. The four-dimension model as illustrated in Fig. 4.5 was successfully replicated.

![Diagram of health behaviour dimensions](https://example.com/diagram.png)

**Fig 4.4 Proposed Hierarchical Model of Health Behaviours (Vickers, 1994).**
The behaviours that defined different dimensions provided a starting point for interpreting the findings in terms of individual differences in health behaviours. These categories related to: a) maintaining and enhancing well-being; b) avoiding or minimizing the effects of accidents; c) taking risks, primarily related to avoidable exposure to automotive or pedestrian hazards; and d) avoiding substances that may adversely affect health (such as tobacco and alcohol) and, to a lesser degree, other factors that may overtax the body's adaptive capacities such as germs and pollution (Vickers et al., 1990).

This hierarchical organization of health behaviours also has important implications for causal effects that give rise to the dimensions. The behaviours may covary because they share common causes or because one behaviour is the cause of another. Thus the two general dimensions of health behaviours may arise because some causal factors influence all behaviours within, but not across the two dimensions (Vickers et al., 1990). The broken line connecting Substance Risk to Preventive Health is intended to indicate that Substance Risk is conceptually an element of Risk Taking, but empirically is linked to Wellness Behaviour as well.

The authors of the model emphasize that this is strictly a proposed model that represents only one possible organizing framework for reviewing what is known about health behaviours and their causes, and for conceptualizing and measuring health behaviours. Consequently, further empirical investigation and testing in further research is needed in order to refine and improve on this model.

Given the interconnections between the mind and the body, it is becoming increasingly apparent that people's beliefs about their health will influence their behaviour, which will in turn influence their bodies and physiological systems. A greater understanding of where people are placed in terms of their health beliefs and behaviours not only highlights the role of individual responsibility in maintaining health and well-being, but will ultimately allow care givers to pinpoint where changes in attitudes and behaviours can be made to enhance health and reduce illness. This is particularly pertinent in the case of psychosomatic illnesses like irritable bowel syndrome, where little research has been conducted on health attitudes and behaviours.
4.4 Chapter summary and conclusion

After laying a brief theoretical foundation on personality, this chapter then explored the two routes through which personality influences individual functioning. Discussion of the internal route by which personality operates involved examining the internal adjustive demands that stress places on persons, as well as their ability to cope with such demands in terms of both personal and circumstantial resources. Linked to the internal route was the significant psychological component of emotional distress and the proposal that a certain group of IBS sufferers tend to be more "distress-prone" and hence more vulnerable to somatizing their psychological distress through the gut.

The exploration of the external route whereby personality also operates involved examining the notion of lifestyles and habits of living that make a significant contribution towards chronic illnesses such as irritable bowel syndrome. The adoption of a more salutogenic perspective has introduced a more preventative focus and involved examining the role that health behaviours play in illness and health in general and in IBS in particular. Various models proposing a mediating role for health behaviours were also examined, followed by a discussion of other moderating factors such as social support, coping, self-control and self-efficacy as well as the sociocultural context. Overall it was emphasized that as health behaviours tend to be guided by health beliefs, greater understanding of both can only be beneficial to caregivers and sufferers alike.

Based on the empirical evidence supporting these two routes through which personality can influence health and illness, it seems appropriate to consider the role that broad dimensions of health behaviours and personality traits may play in irritable bowel syndrome. The attempt to determine this relationship between personality, health behaviours and irritable bowel syndrome is explicated in the next chapter on the empirical investigation of the study.
Chapter 5

Empirical Investigation

The previous chapters laid the philosophical and theoretical foundations for the present research study, which forms part of a larger research project undertaken by the Counselling and Research Center for Psychogastroenterology of the Rand Afrikaans University in Johannesburg. The focus of the project was to facilitate greater understanding of the relationship between psychology and human physiology with respect to the functional gastrointestinal disorders, specifically irritable bowel syndrome, the most common of these disorders. As outlined in chapter three, not only has the change in conceptual framework enhanced our understanding of IBS, but it has also legitimized the notion of functional or psychosomatic disorders, where disturbance of physiological function rather than anatomical structure is strongly associated with psychosocial factors. Although it is now generally accepted that personality plays an important role in the pathogenesis of functional disorders, research results showing the link between personality and IBS specifically are still unclear. Given that personality has two main routes through which it might influence health and illness and hence the etiology and development of IBS, the stress and emotional reactivity of the internal physiological route, and health habits of the external behavioural route, are therefore the subject of this empirical investigation. The present study has sought to investigate the link between IBS, health behaviours and personality in a carefully delineated group of patients with IBS. This chapter centers on the practical aspects of the study and commences with a comprehensive description of the research problem and specific aims of the study. Details are then provided of the subjects who participated in the study together with the selection instruments used. The psychometric qualities of the measuring instruments are described. Finally, the hypotheses of this study are outlined and the statistical procedures specified.

5.1 Research problem
Due to the enigmatic nature of irritable bowel syndrome and the fact that few IBS sufferers demonstrate precisely the same set of symptoms, research results on the link between personality and IBS specifically remain controversial and contradictory (Tally et al., 1990). Although Tally et al. (1990) isolated no distinct personality profile...
for IBS patients, Devroede (1994) reported a direct link between personality and defecation patterns of healthy volunteers using the MMPI. This same author also found the personality profiles between those with severe chronic idiopathic constipation to be completely distinct from those of arthritic controls. What has been established is that IBS patients exhibit more chronic illness behaviour in the form of frequent doctor visits, multiple somatic complaints and abnormal concern with minor illness (Drossman et al., 1988; Drossman et al., 1994; Prior, 1995). This supports emerging evidence of the existence of an "illness-prone" or "distress-prone" personality (Friedman, 1990) rather than a specific IBS personality type per se.

Given the mediating role of personality in shaping health and illness through an internal physiological route involving stress and emotional disturbance, and the external behavioural route such as health behaviours, it seems pertinent to examine the influence of both in terms of the etiology and development of IBS. Constructive criticism has addressed several aspects of personality research concerning the adequacy of previous personality measurement techniques, particularly the scattered accumulation of conceptually isolated measures and traits. Given this, it appears that personality research has not taken full advantage of recent conceptual and methodological developments in the general study of personality. Consequently, new measures such as Costa and McCrae’s (1992) Five-Factor Model may contain potential solutions to many of the problems currently plaguing the study of personality. In the same vein, much research on health habits or behaviours has traditionally concentrated on single health practices such as smoking or going for medical check-ups, even though the latest research shows that health behaviours tend to occur in definite clusters. Given that overall patterns of health behaviours predict mortality and morbidity better than single health behaviours, and that there is evidence that health behaviours might contribute towards the understanding of the personality-disease link (Booth-Kewley & Vickers, 1994), any research demonstrating a reliable association between personality and health behaviours, would enhance understanding of both areas.

Based on the latest understanding that personality can be adequately assessed using just five broad dimensions (Neuroticism, Extraversion, Conscientiousness, Agreeableness and Openness to Experience) and that health related behaviours may be most useful when understood as elements of overall behaviour patterns, together with the failure of earlier research to consider these broad health dimensions and to omit important personality dimensions, there may well have been an underestimation
of the influence of personality on health behaviour (Smith & Williams, 1992). In attempting to account for variability in the manifestation of the functional disorders, particularly IBS, it is plausible to speculate that certain broad personality dimensions contribute either directly or indirectly to the etiology of particular illnesses or even to illness susceptibility in general. Even if a personality dimension is important only because of its association with certain health related behaviours, then this knowledge stands to play a powerful role in helping to transform behaviour and develop healthier lifestyles. As such it can contribute towards the design of more effective prevention and intervention strategies. This is particularly significant, given the general scarcity of IBS research in the South African context, and it is hypothesized that valuable insights may be gained from exploring the links between IBS, health behaviours and personality within this multi-cultural society.

5.2 Aims of the research

This section examines the aims of this particular research study in terms of a general more encompassing aim which is covered in section 5.2.1 and a specific operationalized aim to be elaborated on in section 5.2.2.

5.2.1 General aim

As outlined in the philosophical foundation of the study, the global trend towards more holistic and integrative worldviews highlights the increasing interconnectedness between phenomena traditionally seen as isolated and fragmented, particularly between the realms of mind and matter or mind and body. Whilst all psychological research is aimed at improving understanding and knowledge of humans and their behaviour, given the recent emphasis on holism, the broadest, most encompassing aim of this particular study is to try to contribute greater knowledge and understanding about the phenomena of psychosomatic illness which intersects the mind/body interface. As the name suggests, the psychosomatic illnesses accentuate the interdependence of mind and body and hence of the physical, social, psychological and environmental dimensions in shaping illness and health. Through exploring a particular area of psychosomatic illness, the functional gastrointestinal disorders, in more depth, it is hoped that better understanding will be gained of the role that psychosocial factors play in the etiology, course and treatment of these disorders, given the current ambiguity and confusion that surrounds them. More specifically, it is hoped that this greater understanding and knowledge will be of
heuristic value and will generate much needed new theories and information around the functional gastrointestinal disorders.

It was with this in mind, that the larger Psychogastroenterology project for Counselling and Research was initiated at the Rand Afrikaans University. As pointed out in the introduction to this chapter, the specific focus of the project was to facilitate greater understanding between psychology and human physiology with respect to the functional gastrointestinal disorders, particularly the irritable bowel syndrome, the most common of these. The ultimate purpose of the project was to devise suitable therapeutic strategies to facilitate the return of health of IBS sufferers, which was achieved via the empirical investigation of the nature and psychosocial concomitants of IBS, as well as various therapeutic strategies.

5.2.2 Specific operationalized aim
The present study relates to the personality and health behaviour differences between two groups of adult female subjects, the one group suffering from IBS and the second group consisting of healthy subjects. The operationalized aim of the study is then:
- To identify 60 patients with IBS as diagnosed by a physician in accordance with certain internationally approved criteria and
- To identify 60 non-IBS controls who will complete a patient questionnaire in order to eliminate the possibility of IBS.

Both groups will also complete the NEO PI-R (Costa & McCrae, 1992) and the Health Behaviour Checklist (Vickers et al., 1990) and statistical procedures will then be applied to ascertain differences between the two groups with regard to the two test batteries.

5.3 Subjects
The subjects used in this study will be discussed in terms of the population and sample of subjects respectively, the selection instruments applied, the experimental and control groups, as well as characteristic variables determining the overall profile of the subjects.

5.3.1 Population versus sample
Due to the nature of the IBS Project, there were two phases of subject selection. The first phase concerned the overall selection of subjects from the population for the
entire project. The second phase concerned the selection of specific samples for each individual study. It is important to distinguish between what is meant by the statistical terms 'population' and 'sample'. According to Reber (1985), a 'population' is the total number of cases about which a specific statement can be made. Populations may be finite, existing and knowable; finite, existing but effectively unknowable or lastly, infinite. A sample on the other hand, is some observed or selected subset of the population (Reber, 1985). The population in the case of the present study would be broadly, the white females in the Gauteng region and possibly South Africa, which is finite, existing but effectively unknowable. The samples in this particular study refer to the experimental group of white, female IBS patients and the control group of healthy white, female subjects, selected from Gauteng, a particular province within South Africa. Clearly, the more representative the sample is of the particular population used, the better will be the generalizability of the results to the entire population and the more useful the data.

5.3.2 Selection instruments
The sample groups were selected through a specific procedure whereby they had to complete two basic selection instruments in order to qualify for either the experimental or control group. The two selection instruments used are outlined briefly in sections 5.3.2.1 and 5.3.2.2.

5.3.2.1 The Biographical Questionnaire
The IBS researchers compiled the Biographical Questionnaire in order to elicit certain personal information from both the experimental and subject groups. Table 5.1 provides more information on the two groups in terms of the different variables.
Table 5.1 Description of the IBS Group and the Control Group

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group</th>
<th>Control Group</th>
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<tbody>
<tr>
<td></td>
<td>N=60</td>
<td>N=60</td>
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<tr>
<td><strong>AGES</strong></td>
<td></td>
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</tr>
<tr>
<td>20-29</td>
<td>12</td>
<td>10</td>
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<tr>
<td>30-39</td>
<td>22</td>
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<td>50-59</td>
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<td>60-69</td>
<td>2</td>
<td>6</td>
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<tr>
<td><strong>EDUCATIONAL LEVEL</strong></td>
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<tr>
<td>&lt;Matric</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>Matric</td>
<td>19</td>
<td>26</td>
</tr>
<tr>
<td>Post Matric</td>
<td>28</td>
<td>25</td>
</tr>
<tr>
<td><strong>OCCUPATION</strong></td>
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<td></td>
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<tr>
<td>None</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Technical</td>
<td>2</td>
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<tr>
<td>Business</td>
<td>25</td>
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<td>Professional</td>
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<td>24</td>
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<tr>
<td>Service</td>
<td>12</td>
<td>8</td>
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<tr>
<td>Manufacturing</td>
<td>2</td>
<td>0</td>
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<tr>
<td><strong>EMPLOYMENT STATUS</strong></td>
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<td>Homemaker/Unemployed/Retrenched</td>
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<td>8</td>
</tr>
<tr>
<td>Part-time Employment</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Full-time Employment</td>
<td>38</td>
<td>37</td>
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<tr>
<td><strong>MONTHLY INCOME</strong></td>
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<tr>
<td>0-R2 000</td>
<td>14</td>
<td>12</td>
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<tr>
<td>R2 000 – R6 000</td>
<td>38</td>
<td>33</td>
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<tr>
<td>&gt;R6 000</td>
<td>8</td>
<td>15</td>
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<tr>
<td><strong>NUMBER OF CHILDREN</strong></td>
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</tr>
<tr>
<td>0</td>
<td>16</td>
<td>12</td>
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<td>1-3</td>
<td>39</td>
<td>44</td>
</tr>
<tr>
<td>&gt;4</td>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>
In order to ensure that the two groups were kept as homogeneous as possible, the extraneous variables of age, gender and race were controlled for. It was decided that only *female subjects* would be used based on the low number of men who responded. This is in line with the international IBS statistics for western industrialized nations where although the prevalence of symptoms is similar in both genders, more women than men report and seek help for their IBS symptoms (Farthing, 1995). Another consideration relates to possible differences in personality and health behaviour dimensions, which would be better controlled for by focusing on only women.

*Race* was controlled for by only using white women. This was not only because the majority of respondents in this study were white, but also due to possible variations in the cultural interpretations of health and illness. Furthermore, a history of unequal access to health-care facilities may be an additional factor biasing certain sectors of the South African population to seek health care. It is also possible that cultural differences may influence the expression of the personality and health behaviour dimensions.

As personality takes time to develop and mature and hence only really stabilizes in adulthood (Maddi, 1996), a lower *age limit* of 18 years was set and *white females* between the ages of 18 and 69 were included. Consistent with the results of epidemiological surveys that indicate that IBS is prevalent in younger persons between the ages of 15 and 55 range (Drossman et al., 1994; Lynne & Friedman, 1993), as shown in Table 5.1, the bulk of respondents in both experimental and control groups, fulfilled this criteria. As can be seen, the greatest numbers of IBS sufferers can be placed between the ages of 30-39 (37%) and 40-49 (27%) as compared to the control group where most subjects fell between the categories of 30-39 (32%) and 50-59 (24%).

Subjects were also required to detail their highest educational qualification in order to ensure an even spread between the groups. As Table 5.1 shows, most of the IBS patients and control group subjects were in possession of a post-matric qualification (47% and 42% respectively), with 32% of the experimental group having at least a matric compared to 43% of the control group.

Enquiry into type of occupation showed the bulk of the experimental group subjects being represented in the Business category (42%) and Professional category (27%).
This is compared to 40% professionals amongst the control group subjects and 32% representing the business field.

The earning capacity for both groups fell between the R2000-R6000 range, with the 63% of the experimental group representing this earning bracket and 55% of the control group. It was necessary to know this so as to ensure as much homogeneity as possible between subjects.

It was also deemed necessary to know the distribution of children amongst the women as this may also have been a factor influencing IBS in some way. Most the women in the experimental group (65%) have between one and three children as compared to 73% of the women of the control group.

Although respondents were also asked about the importance of religion in their lives, their history of psychiatric problems and whether they were currently on any medication, this information was not used in this particular study.

5.3.2.2 The Irritable Bowel Syndrome Client Questionnaire

The Irritable Bowel Syndrome Client Questionnaire was devised by international researchers Drossman et al. (1994), Thompson and Hawkey (1995) as well as Tally et al., (1990). The questionnaire is divided into parts A and B, with the former focusing on the nature of the IBS symptoms and subjects being asked to rate the severity and frequency of their abdominal pain on linear rating scales. The questionnaire also involved additional questions determining the level of pain associated with bowel movements as well as stool consistency, but these were not relevant to this particular study.

Questions in the Section B are designed to determine the severity of the IBS symptoms. Using linear rating scales, the subject is required to indicate the amount of abdominal pain experienced and then to complete a number of yes/no questions regarding the extent to which they believe their pain has interfered with daily activities and whether continuous or frequently occurring pain has been experienced for at least three months. The number of doctor visits over the past three months are also noted in this section.
It was necessary for both experimental and control groups to complete this questionnaire in order to ensure that the control group had IBS (and not something more serious) and that the majority of subjects in the control group did not have IBS.

5.3.3 Selection procedure

The selection procedure of both IBS patients and non-IBS control subjects is described in the following sections 5.3.3.1 and 5.3.3.2.

5.3.3.1 Experimental group

The IBS patients were recruited in various ways. Specialist gastroenterologists, general practitioners and dieticians within the Witwatersrand area were notified in writing of the establishment of the Counselling and Research Centre for Psychogastroenterology. In this regard, details were provided of the broad intent of the project to contribute towards international research on the psychosocial concomitants of the functional gastrointestinal disorders. Doctors were invited to refer patients positively diagnosed with IBS to the Centre for free individual or group counselling services as part of the research on therapy should they so wish, or alternatively to help participate in the basic research, or both types of research. The referring doctor was requested to complete a client referral form which provided details of the patient's symptoms, the tests conducted to exclude possible pathology of the gastrointestinal tract as well as current medical treatment.

An article on IBS and the Research Project was also published in the Medical Chronicle, a popular local journal, and an insert publicizing the Counselling and Research Centre for Gastroenterology appeared in a number of Johannesburg suburban newspapers. Contact telephone numbers at the Centre were provided and the response to these articles was overwhelming, with inquiries continuing several months after publication. A second article was then run in a popular Afrikaans women's magazine, a few months later, which again provided a substantial influx of clients seeking advice and counselling on IBS. Many potential subjects from as far afield as Durban and Cape Town who had somehow read of the project or been referred by family and friends had to be excluded from participation in the study due to logistical problems preventing attendance for face-to-face interviews, testing and counselling. In addition, each client who expressed an interest in participating in the project was required to obtain a client referral form completed by their doctor to confirm a diagnosis of IBS and to rule out organic pathology. It is possible that due to this particular method of sampling, the experimental group was not truly random but
rather attracted a select group of sufferers, namely health care seekers. This selection procedure enabled the selection of a reasonably sized experimental group (N=60) of white, female IBS subjects.

5.3.3.2 Control group
The non-IBS subjects used in the control group were selected through a “pool” of friends and associates. This proved to be a highly successful method, which produced a fairly randomized control group that displayed a variety of occupations and ages. The primary requirement was that the controls had never been diagnosed as having IBS. This procedure also allowed the selection of a suitably sized control group (N=60).

The group of non-IBS females were required to complete the Biographical Questionnaire and the IBS Client Questionnaire as part of the selection procedure in order to determine whether they qualified for the control group in terms of not having IBS. Once these questionnaires had been completed, the control group was required to fill out both the NEO Personality Inventory and the Health Behaviour Checklist. In line with instructions of both the measuring instruments, the control subjects were allowed to complete the tests independently in their own time without supervision of the researchers, provided that telephonic assistance was available if necessary.

5.4 Testing procedure
Once selected into the IBS Group, the subjects were required to attend a semi-structured interview conducted by one of the researchers at the Counselling and Research Centre for Psychogastroenterology. During this session, which was approximately 30 minutes, the Biographical Questionnaire and IBS Client Questionnaire were completed and subjects were given the opportunity to highlight any concerns or problems with respect to their personal situations.

Both the IBS female group and the female control group were required to complete the two measuring instruments of the study, the NEO Personality Inventory and the Health Behaviour Checklist. Based on the test and interview results, IBS subjects were then allocated to various IBS research therapists for specialist counselling in either stress management, group therapy for anxiety and depression or individual counselling.
5.5 Measuring instruments

The measuring instruments used in this particular study, as well as their psychometric properties, and administering and marking procedures are described in sections 5.5.1, on the NEO Personality Inventory and 5.5.2, on the Health Behaviour Checklist.

5.5.1 The NEO Personality Inventory (NEO PI-R)

The Revised NEO Personality Inventory (NEO PI-R) is a concise measure of the five major dimensions, or domains, of personality and some of the more important traits or facets that define each domain. Devised by Costa and McCrae (1992), this relatively short paper-and-pencil test takes approximately 30 minutes for respondents to complete and may be administered to individuals or groups.

5.5.1.1 Content of the NEO PI-R

The NEO PI-R presents five broad domains of personality, which are divided into six discrete traits. Of the two versions of the NEO PI-R, Form S for self-reports and form R for observer ratings, only the former was used in this study. Form S consists of 240 items answered on a 5-point scale, ranging from 'Strongly disagree' to 'Strongly Agree'. The five broad domains comprising the NEO PI-R are:

- **Neuroticism**: this dimension describes an individual's situation with respect to emotional adjustment or stability. It refers to a general tendency to experience negative affects such as fear, sadness, anger, disgust or guilt. The six facets are Anxiety, Angry hostility, Depression, Self-consciousness, Impulsiveness and Vulnerability.

- **Extraversion**: this dimension offers an explanation for a disposition towards positive emotions, sociability and high levels of activity. The Extraversion facets include Warmth, Gregariousness, Assertiveness, Activity, Excitement-seeking and Positive Emotions

- **Openness to Experience**: refers to a receptive orientation towards varied experiences and ideas and the six facets are Fantasy, Aesthetics, Feelings, Actions, Ideas and Values.
• **Agreeableness**: this dimension offers a description of the inclination towards interpersonal trust and consideration of others. The six facets cover Trust, Straightforwardness, Altruism, Compliance, Modesty and Tender-mindedness.

• **Conscientiousness**: refers to the tendency towards industriousness, organization and persistence. The facets include Competence, Order, Dutifulness, Achievement striving, Self-discipline and Deliberation (Costa and McCrae, 1992).

5.5.1.2 Administration of the NEO PI-R

The NEO PI-R is a self-administered test, which can be conducted in either individual or group testing situations. For the purposes of this study it was more convenient to administer the test in a group context and usually on a Saturday morning due to the work constraints of many respondents. The groups completed the tests in the presence of either an IBS researcher or psychometrist so that a trained person was always on hand to answer any queries. Once respondents provided the necessary demographic information, they were required to read the instructions and complete the answer booklet. The importance of answering all items was emphasized as well as the necessity of only choosing one response per item. Although there is no time limit for completing the test, most respondents require between 30 and 40 minutes with slower readers needing slightly more time.

5.5.1.3 Scoring of the NEO PI-R

Although the NEO PI-R can be both machine or hand scored, the latter option was used for the purposes of this study. The test is considered invalid if more than 41 responses have been omitted, whilst fewer than 41 missing responses are treated as if a neutral response was offered. However, Costa and McCrae (1992) warn that individual facet scores require cautious interpretation when more than 3 responses are absent. In large research samples the group mean for an item can be substituted for missing responses. Either raw scores or T scores can be used depending on the purposes of the study. Only raw scores were used in this instance as it was strictly a comparative study determining the difference between two groups. An NEO Summary is completed for the purposes of feedback to the respondent as Costa and McCrae (1992) recommend that it is generally not appropriate to provide detailed feedback on the actual scores. This advice was followed and respondents were given feedback in terms of their overall summary sheet if they requested it.
5.5.1.4 Psychometric Properties of the NEO PI-R

In terms of the reliability of the NEO PI-R, internal consistency was determined using the coefficient alpha. According to data sources, individual consistencies for the individual facet scales range from 0.56 to 0.81 in self-reports, and from 0.60 to 0.90 in terms of observer ratings, thus indicating satisfactory levels of consistency and test-re-test reliability (Costa & McCrae, 1992).

Data on construct validity demonstrates that the NEO PI-R scales are generally successful with respect to the measurement of intended constructs. Given that validity refers broadly to the success with which a scale measures the construct it purports to, there are many forms of validity and the authors (Costa & McCrae, 1992) claim that the NEO PI-R scales ought to show evidence of validity in many ways and in many different samples and provide considerable evidence that they do. The authors have summarized their data on both convergent and discriminant validity based on self-reports with single peer ratings on all 30 NEO PI-R facets. The median convergent validity coefficients for the facet scales of each domain are summarized as .30, .40, .38, .31 and .34 for A and C respectively. They also calculated the true discriminant correlations between self-reports on facet scales in one domain with peer ratings on facet scales in other domains and vice versa. There are 288 such discriminant correlations for each domain. The median absolute correlations for the five domains were 0.7, .10, .08, .09 and .08. These correlations which are close to zero, provide clear evidence of the discriminant validity of the individual facet scales.

5.5.2 The Health Behaviour Checklist (HBC)

The Health Behaviour Checklist is a self-administered paper-and-pencil test developed for the use of adults over the age of 18 years. The content, administration, scoring and psychometric properties of the measure will be discussed in the following sections 5.5.2.1 to 5.5.2.4.

5.5.2.1 Content of the HBC

The Health Behaviour Checklist (HBC), devised by Vickers et al. (1990), is designed to operationalize their Hierarchical Model of Health Behaviours. In assuming that health behaviours are hierarchically organized and occur as broad dimensions rather than single behaviours, Vickers et al. (1990) found four different dimensions identifying behaviours relating to a) maintaining and enhancing well-being; b) avoiding or minimizing the effects of accidents; c) taking risks, primarily related to avoidable exposure to automotive or pedestrian hazards; and d) avoiding substances
that may adversely affect health (e.g. tobacco and alcohol) and, to a lesser degree, other factors that may overtax the body's adaptive capacities (e.g. germs and pollution).

The inventory consists of 40 items, 26 of which are used to assess the four health behaviour domains defined and with 14 additional filler items comprising the fifth dimension, Additional Items. The 26 items represent preventive behaviours in the sense of activities undertaken by individuals who believe themselves to be in good health for the purposes of maintaining or improving health, whilst the 14 filler items refer largely to daily health habits most people are expected to undertake.

The HBC measures five replicable factors:

1) The Additional Items dimension includes items like “I get enough sleep”; “I eat a balanced diet” and “I pray or live by principles of religion”.

2) The Wellness Maintenance and Enhancement dimension consists of items such as: “I exercise to stay healthy”; “I see a doctor for regular check-ups” and “I watch my weight”.

3) The Accident Control dimension includes items like “I fix broken things around the home straight away”; “I keep emergency phone numbers near the phone”, and “I have a first aid kit in my home”.

4) The Traffic Risk Taking dimension consists of items such as “I drive after drinking”; “I cross the street against the stop light” and “I engage in activities or hobbies where accidents are possible” (E.g. motorcycle riding, skiing, using power tools, sky or skin diving, hang gliding etc).

5) The Substance Risk Taking dimension includes items like “I do not drink”; “I don't smoke”, and “I avoid areas with high pollution”.

5.5.2.2 Psychometric properties of the HBC

Vickers et al. (1990) report modest intercorrelations amongst the four health behaviour dimensions with correlation averages across four samples ranging from 0.10 to 0.48. Adequate coefficient alpha internal consistencies of 0.65 or greater were obtained for all scales except the Substance Risk Taking scale, which had an
average alpha of 0.55. Despite repeated attempts to contact the authors of this measure in order to obtain more information about the validity, this is still unknown and is thus one of the limitations of the study.

5.5.2.3 Administration of the HBC
The test is a self-administered one that can be conducted in either individual or group settings. Each respondent is asked to indicate how well the specific health behaviour describes her typical behaviour on a 5 point Likert scale ranging from "Strongly disagree" (scored 1) to "Strongly agree" (scored 5). Respondents are encouraged to avoid the neutral or "don't know" response as much as possible and the importance of answering all items is emphasized.

5.5.2.4. Scoring of the HBC
To facilitate the scoring procedure of the HBC a spreadsheet was devised in which all the dimensions and their relevant items were listed. All respondent's raw scores were then entered in a systematic way and automatically computed. The lower the score, the poorer their health behaviour on that particular dimension. However, one problem that was noted during administration of the test, which clearly affects the scoring and interpretation, was the apparent confusion of many subjects as to whether the test required them to respond in terms of how they would like to behave and how they actually behave. This will be discussed further under limitations of the study in chapter seven.

5.6 Hypotheses
Hypotheses formulated by researchers can be either one-tailed or two-tailed. One-tailed hypotheses are usually formulated when there are clear indications in the literature regarding the expected direction of differences between variables. Two-tailed hypotheses are formulated when the direction of the postulated differences is not clearly indicated in the literature, but rather when contradictory results are reported in research. For the purposes of this study, two-tailed hypotheses were formulated based on the lack of conclusive evidence regarding the directional nature of the differences between the research variables under investigation.

It is also necessary to formulate null and alternate hypotheses for statistical purposes. However, this study will only formulate alternate hypotheses as the null
hypothesis merely hypothesizes that there is no relationship between the variables under investigation and can become tedious reading (Kerlinger, 1996).

5.6.1 Composite hypothesis 1
There will be a statistically significant difference between the vector of the averages of Group 1 (IBS female subjects) and Group 2 (non-IBS control group) with regard to the following five variables as measured by the NEO PI-R taken together. This composite hypothesis can be divided into 5 sub-hypotheses:

Alternative sub-hypothesis 1.1
There will be a statistically significant difference between the mean scores of Group 1 (IBS female subjects) and the mean scores of Group 2 (non-IBS control group) with regard to the Neuroticism subscale of the NEO PI-R.

Alternative sub-hypothesis 1.2
There will be a statistically significant difference between the mean scores of Group 1 (IBS female subjects) and the mean scores of Group 2 (non-IBS control group) with regard to the Extraversion subscale of the NEO PI-R.

Alternative sub-hypothesis 1.3
There will be a statistically significant difference between the mean scores of Group 1 (IBS female subjects) and the mean scores of Group 2 (non-IBS control group) with regard to the Openness to Experience subscale of the NEO PI-R.

Alternative sub-hypothesis 1.4
There will be a statistically significant difference between the mean scores of Group 1 (IBS female subjects) and the mean scores of Group 2 (non-IBS control group) with regard to the Agreeableness subscale of the NEO PI-R.

Alternative sub-hypothesis 1.5
There will be a statistically significant difference between the mean scores of Group 1 (IBS female subjects) and the mean scores of Group 2 (non-IBS control group) with regard to the Conscientiousness subscale of the NEO PI-R.
5.6.1.1 Rationale for composite hypothesis 1

Despite the meager and sometimes ambiguous research regarding personality characteristics associated with the functional gastrointestinal disorders, differences between the two groups are nevertheless expected in at least two dimensions of the NEO PI-R personality measure. In particular, differences are expected on the Extraversion/Introversion dimension given that at least three studies between 1973 and 1985 (Esler & Goulson, 1973; Langeluddecke, 1985) have reported IBS patients to be more introverted when compared to healthy controls and to general medical patients in general. However, contradictory research reported by Palmer et al. (1974 in Bayne, 1997) found no differences in introversion between his sample groups and IBS sufferers. Regarding the Neuroticism dimension, although the NEO PI-R has not been used on IBS sufferers in the past, other personality measures using a similar measure of Neuroticism have found IBS sufferers to be more depressed and anxious (Drossman et al., 1994; Ford et al., 1985); to demonstrate multiple somatic symptoms and to consult medical practitioners more often than the general population (Ford et al, 1985). As no previous studies have been conducted on IBS patients using the last three dimensions, Openness, Agreeableness and Conscientiousness, the author is unsure as to whether there will be any differences on these personality dimensions.

5.6.2 Composite hypothesis 2

There will be a statistically significant difference between the vector of averages of Group 1 (IBS female subjects) and Group 2 (non-IBS control group) with regard to the following five variables as measured by the HBC taken together.

Alternative sub-hypothesis 2.1

There will be a statistically significant difference between the mean scores of Group 1 (IBS female subjects) and the mean scores of Group 2 (non-IBS control group) with regard to the Wellness Maintenance and Enhancement subscale of the HBC.

Alternative sub-hypothesis 2.2

There will be a statistically significant difference between the mean scores of Group 1 (IBS female subjects) and the mean scores of Group 2 (non-IBS control group) with regard to the Accident Control subscale of the HBC.
Alternative sub-hypothesis 2.3
There will be a statistically significant difference between the mean scores of Group 1 (IBS female subjects) and the mean scores of Group 2 (non-IBS control group) with regard to the *Traffic Risk Taking* subscale of the HBC.

Alternative sub-hypothesis 2.4
There will be a statistically significant difference between the mean scores of Group 1 (IBS female subjects) and the mean scores of Group 2 (non-IBS control group) with regard to the *Substance Risk Taking* subscale of the HBC.

Alternative sub-hypothesis 2.5
There will be a statistically significant difference between the mean scores of Group 1 (IBS female subjects) and the mean scores of Group 2 (non-IBS control group) with regard to the *Additional Items* subscale of the HBC.

5.6.2.1 Rationale for composite hypothesis 2
Given that the etiology and course of chronic diseases such as the functional gastrointestinal disorders are being increasingly linked to a multiplicity of factors, particularly behavioural and cognitive habits (Thorensen, 1980; Thorensen & Eagleston, 1985) is expected that some differences will exist between the two groups on some dimensions of the Health Behaviour Checklist. Differences on some health behaviour dimensions are expected particularly given that research demonstrates that factors such as smoking, excessive alcohol intake, reckless driving and failure to use seat belts among others, has demonstrably negative effects on health (Belloc & Breslow, 1972; Mechanic & Cleary, 1980). However, these results need to be interpreted with caution given that other research in the area of health behaviours indicates that practically everyone in the respective studies performed at least some regular health protective behaviours and that most people perform many or a wide range of these behaviours (Harris & Guten, 1979).

5.6.3 Composite hypothesis 3
The group centroids of the two criterium groups (IBS female patients and non-IBS clients) differ statistically significantly.
5.7 Statistical analyses

The BMDP 3D and 7M statistical package of the University of California, Los Angeles will be utilized for the analysis of statistical data.

Hotelling's T-square-test will be used to determine whether the vector of averages between the two groups (the IBS group versus the non-IBS group) differ statistically from one another with regard to the scores on the five subscales of the NEO PI-R taken together. Hotelling's T-square-test will also be used to determine whether the vector of averages between the two groups (the IBS group versus the non-IBS group) differ statistically from one another with regard to the five subscales of the HBC taken together.

Student's t-test will be used to determine whether the two averages differ significantly, and the F-test ascertains whether the variances of the two independent groups are homogeneous.

The Hotelling's T-square-test is comparable with Mahalanobis D-square test. Both have an associated F-value with two sets of degrees of freedom. The F-table is used to determine the significance of the F-value. For the purposes of the present study the probability criteria were set at 0,05 and 0,01. In cases where the Hotelling's T-square is found to be statistically significant, it may be concluded that the two vectors of averages that are being compared, are statistically significantly different. The Student's t-test is then used to determine in which specific respects the two groups differ.

Stepwise discriminant analysis is useful for ascertaining which quantitative measurements (in the case of the present study the 5 NEO PI-R and 5 HBC variables) optimally discriminate amongst two or more groups (in the case of the present study the IBS versus the non-IBS group), the aim being to predict into which group a new case is most likely to fall, or to obtain a small number of useful discriminating variables. The BMDP 7M statistical package will be used to perform a stepwise discriminant analysis in the present study.
5.8 Chapter summary
The practical features of this present study were delineated in this chapter. This included the aim of the investigation, a description of the subjects and selection process used as well as an outline of the measuring instruments. Lastly, the hypotheses of the study were presented and the statistical techniques to be used to analyze the data described.

The next chapter will look at the results of these analyses as a basis for the final chapter, which discusses and interprets the findings in terms of the theoretical orientation of the investigation.
Chapter 6

Results

This chapter details the results of the data analyses. Once the NEO PI-R and HBC inventories had been hand-scored, the raw scores were sent to the Statistical Consultants at the Rand Afrikaans University for statistical analysis. The BMDP3D programme of the Health Sciences Computing Facility, University of California, Los Angeles was used for the calculation of the Hotelling T-square test, the F-values and the Student’s t-test. The BMDP 7m programme of the Health Sciences Computing Facility, University of California, Los Angeles was used for the discriminant analysis. The results of these statistical analyses are presented in tabular format.

The results will be presented according to the hypotheses outlined in the previous chapter.

6.1 Results of composite hypothesis 1 (and 1.1 – 1.5)
Significance of difference between the vector of averages of Group 1 (IBS female subjects) and Group 2 (non-IBS control group) with regard to the five variables as measured by the NEO PI-R taken together.

To establish whether a statistically significant difference exists between the IBS female subjects and the non-IBS control group, the vectors of averages between the two groups regarding the Revised NEO Personality Inventory’s five subscales were compared after being calculated using Hotelling’s T square-test. The results are shown in Table 6.1.
Table 6.1 Significance of Difference between Group 1 and group 2 with regard to the five subscales of the NEO PI-R

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group 1 (IBS) N=60</th>
<th>Group 2 (Non-IBS) N=60</th>
<th>Levene F-test for variability</th>
<th>t-test for differences between means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td>SD</td>
<td>X</td>
<td>SD</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>112.617</td>
<td>27.114</td>
<td>91.8</td>
<td>26.993</td>
</tr>
<tr>
<td>Extraversion</td>
<td>101.15</td>
<td>19.471</td>
<td>111</td>
<td>18.111</td>
</tr>
<tr>
<td>Openness</td>
<td>112.55</td>
<td>16.299</td>
<td>119.867</td>
<td>19.34</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>117.883</td>
<td>14.474</td>
<td>112.45</td>
<td>17.951</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>118.617</td>
<td>20.577</td>
<td>115.217</td>
<td>19.548</td>
</tr>
</tbody>
</table>

Hotelling T-square Test: 34.257  ** = Significant 1% level (p<0.01)
F-value: 6.619  * = Significant 5% level (p<0.05)
FD: 5.14
P: 0.000**

According to Table 6.1, Hotelling's T square is 34.257 with an associated F-value of 6.619. This variance is statistically significant (p=0.001). The null hypothesis is rejected and the alternative composite hypothesis 1 is accepted, indicating that the vector of averages is statistically different between the IBS patient group and the non-IBS control group.

Since the null hypothesis has been rejected, and support for the alternative hypothesis has been established, Student's t-test was used to establish in which subscales of the Revised NEO Personality Inventory these differences were apparent. According to Table 6.1 the following results emerged:

There is a statistically significant difference between Group 1 (IBS female subjects) and Group 2 (non-IBS control group) regarding the Neuroticism subscale of the NEO PI-R (p = 0.000).
There is a statistically significant difference between Group 1 (IBS female subjects) and Group 2 (non-IBS control group) regarding the Extraversion subscale of the NEO PI-R ($p = 0.0049$).

There is a statistically significant difference between Group 1 (IBS female subjects) and Group 2 (non-IBS control group) regarding the Openness subscale of the NEO PI-R ($p = 0.0269$).

There is no statistically significant difference between Group 1 (IBS female subjects) and Group 2 (non-IBS control group) regarding the Agreeableness subscale of the NEO PI-R ($p = 0.1277$).

There is no statistically significant difference between Group 1 (IBS female subjects) and Group 2 (non-IBS control group) regarding the Conscientiousness subscale of the NEO PI-R ($p = 3.5553$).

Thus, Null hypotheses 1, 1.1, 1.2, 1.3, are rejected and the alternative hypotheses are accepted.

6.2 Results of composite hypothesis 2 (and 2.1 – 2.5)
Significance of difference between the vector of averages of Group 1 (IBS female subjects) and Group 2 (non-IBS control group) with regard to the five variables as measured by the HBC taken together.
Table 6.2 Significance of Difference between Group 1 and group 2 with regard to the five subscales of the HBC

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group 1 (IBS) N=60</th>
<th>Group 2 (Non-IBS) N=60</th>
<th>Levene F-test for variability</th>
<th>t-test for differences between means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td>SD</td>
<td>X</td>
<td>SD</td>
</tr>
<tr>
<td>ADD</td>
<td>24.45</td>
<td>15.074</td>
<td>42.883</td>
<td>5.231</td>
</tr>
<tr>
<td>WME</td>
<td>34.683</td>
<td>4.645</td>
<td>32.6</td>
<td>6.228</td>
</tr>
<tr>
<td>ACC</td>
<td>19.617</td>
<td>4.614</td>
<td>18.583</td>
<td>4.048</td>
</tr>
<tr>
<td>TRAFFIC</td>
<td>118.967</td>
<td>4.146</td>
<td>19.4</td>
<td>3.747</td>
</tr>
<tr>
<td>SUBSTANCE</td>
<td>114.217</td>
<td>3.47</td>
<td>13.033</td>
<td>3.641</td>
</tr>
</tbody>
</table>

Hotelling T-square Test 96.726 ** = Significant 1% level (p< 0.01)
F-value 18.689 * = Significant 5% level (p< 0.05)
FD 5.114
P 0.000**

According to Table 6.2, Hotelling's T-squared-test is 96.726, with an associated F-value of 18.689. This variance is statistically significant (p = 0.000). The null hypothesis is thus rejected and the alternative hypothesis is supported, namely that the vector of averages of the IBS patient group and the non-IBS control group differ significantly with respect to Health behaviours as measured by the Health Behaviour Checklist. Consequently, Student's t-test was used to establish in which of the subscales these differences were apparent. Of the five subscales, two showed significant differences between the two groups. As shown in Table 6.2, the differences are as follows:

There is a statistically significant difference between Group 1 (IBS female subjects) and Group 2 (non-IBS control group) regarding the Additional Items subscale of the HBC (p= 0.000).
There is a statistically significant difference between Group 1 (IBS female subjects) and Group 2 (non-IBS control group) regarding the Wellness Maintenance and Enhancement subscale of the HBC (p= 0.401).

There is no statistically significant difference between Group 1 (IBS female subjects) and Group 2 (non-IBS control group) regarding the Accident Control subscale of the I-IBC (p=0.1949).

There is no statistically significant difference between Group 1 (IBS female subjects) and Group 2 (non-IBS control group) regarding the Traffic subscale of the HBC (p=0.549).

There is no statistically significant difference between Group 1 (IBS female subjects) and Group 2 (non-IBS control group) regarding the Substance Abuse subscale of the HBC (p=0.071).

Thus, the Null hypotheses, 2, 2.1 and 2.2 are rejected and the alternative hypotheses accepted.

6.3 Results of composite hypothesis 3: the stepwise discriminant analysis for the ten variables of the NEO PI-R and HBC

A stepwise discriminant analysis was performed in order to ascertain which of the ten variables provided the greatest contribution to the differences between the IBS subjects (group 1) and the non-IBS control group (Group 2). The purpose of this technique is to maximally differentiate between two or more criterium groups by means of a number of independent variables.

A stepwise discriminant analysis was executed using the BMDP 7M statistical program according to the following procedure:

An independent variable with an average value which is the most different or outstanding with regard to the criterium groups is selected. For each variable this difference is calculated in terms of the F-ratio, which is the result of an analysis of variance, utilizing the U-statistic (Wilks' coefficient lambda). The variable with the largest F is selected. In each consecutive step the variable with the largest F is selected after the discriminant power of already selected variables is taken into
consideration. This stepwise procedure ends when no further variables significantly contribute to the discrimination between the criterium groups, the default being set at > 4. Coefficients < 4 do not truly contribute to the predicted variance.

Table 6.3. shows the four variables that were extracted, in order of inclusion, and their Wilks’ coefficient lambda.

Table 6.3. The variables that were extracted and their Wilks’ coefficient lambda.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Approximated F-value</th>
<th>U-statistic or Wilks’ coefficient lambda</th>
<th>Approximated F-statistic D.F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Additional Items (HBC)</td>
<td>80.08</td>
<td>0.5957260</td>
<td>1.118</td>
</tr>
<tr>
<td>2 Neuroticism (NEO)</td>
<td>10.59</td>
<td>0.5462635</td>
<td>2.117</td>
</tr>
<tr>
<td>3 Wellness, M &amp; E (HBC)</td>
<td>5.50</td>
<td>0.5215387</td>
<td>3.116</td>
</tr>
<tr>
<td>4 Traffic Risk Taking (HBC)</td>
<td>5.13</td>
<td>0.4992726</td>
<td>4.115</td>
</tr>
</tbody>
</table>

6.3.1 Results of the standardized canonical discriminant function coefficients

In order to determine the relative importance of the different factors that were used in the discriminant function it is necessary to compute the standardized canonical discriminant function coefficients. The absolute size of the coefficient is an indication of the relative importance of the contribution of the factor to the discriminant function. The canonical coefficients appear in table 6.3.1.
Table 6.3.1 Standardized canonical discriminant function coefficients

<table>
<thead>
<tr>
<th>Variables</th>
<th>Canonical coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wellness Maintenance &amp; Enhancement</td>
<td>0.30528</td>
</tr>
<tr>
<td>Traffic Risk Taking</td>
<td>-0.30109</td>
</tr>
<tr>
<td>Additional Items</td>
<td>-0.91029</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>0.45531</td>
</tr>
</tbody>
</table>

The order of importance of the factors in table 6.3.1 is Additional Items, Neuroticism, Wellness Maintenance and Enhancement and Traffic Risk Taking, indicating that Additional Items made the largest contribution; Neuroticism the second largest contribution, Wellness Maintenance and Enhancement the third largest contribution and Traffic Risk Taking the smallest contribution.

6.3.2 Discriminant classification functions
In order to compare the IBS and non-IBS predictions, the discriminant classification function was computed. Overall, 83.3% of all the subjects were correctly classified by the variables Additional Items, Neuroticism, Wellness Maintenance & Enhancement and Traffic Risk Taking as can be seen in Tables 6.3.2. and 6.3.3.

Table 6.3.2 Classification functions

<table>
<thead>
<tr>
<th>Variables</th>
<th>IBS</th>
<th>Non-IBS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wellness Maintenance &amp; Enhancement</td>
<td>1.22382</td>
<td>1.11345</td>
</tr>
<tr>
<td>Traffic Risk Taking</td>
<td>1.27630</td>
<td>1.42764</td>
</tr>
<tr>
<td>Additional Items</td>
<td>0.25585</td>
<td>0.41609</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>0.16916</td>
<td>0.13575</td>
</tr>
</tbody>
</table>

Constant: 
-46.67264               -47.84323
Table 6.3.3 Classification matrix

<table>
<thead>
<tr>
<th>Group</th>
<th>% correctly classified</th>
<th>No of cases</th>
<th>No of cases</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>IBS</td>
<td>Non-IBS</td>
<td></td>
</tr>
<tr>
<td>IBS</td>
<td>70.0</td>
<td>42</td>
<td>18</td>
<td>60</td>
</tr>
<tr>
<td>Non-IBS</td>
<td>96.7</td>
<td>2</td>
<td>58</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>83.3</td>
<td>44</td>
<td>76</td>
<td>120</td>
</tr>
</tbody>
</table>

Based on the results shown in all the above Tables (6.1, 6.2, 6.3, 6.3.1, 6.3.2 and 6.3.3), the null hypothesis with regard to the discriminant analysis is rejected. The variables Additional Items, Neuroticism, Wellness Maintenance and Enhancement and Traffic Risk Taking all contribute to the differentiation between the IBS and non-IBS groups.

The first important value of discriminant analysis is the maximal discrimination between the criterium groups, as discussed above. A second value is the placement of new individuals in one of the criterium groups by using the classification functions as indicated in Table 6.3.3. A discriminant score can be calculated for each new individual with regard to each criterium group by combining the different classification functions linearly. In the present case a 83.3% correct classification can be expected, which is a very satisfactory percentage since it is far in excess of random classification.

6.4 Conclusion

The results presented in this chapter clearly indicate that statistically significant differences exist between the IBS patient group and the non-IBS control group in terms of various dimensions on both the NEO PI-R and HBC. These differences will be discussed in greater detail in the following chapter. In addition, the limitations of the present study will be outlined and conclusions and recommendations for future studies suggested.
Chapter 7

Discussion of Results, Limitations and Recommendations

The personality-gut relationship that is the focus of this study, is just one example of current research attempts to understand the mind-body connection as expoused by holism. The hypotheses presented in the empirical investigation concerned the nature of the relationship between IBS and the two major routes through which personality operates, namely the internal route of stress and emotional dysfunction and the external behavioural route as represented by health behaviours. The question asked at this point was whether individuals suffering from IBS differed from normal healthy individuals in terms of certain personality and health behaviour dimensions. Based on the research findings of this investigation as outlined in the previous chapter, it is clear that differences between the two groups in terms of these dimensions do exist, and it is these differences that will now be discussed in greater detail.

Whilst the internal emotional route and external behavioural route of personality form the basic framework of this discussion chapter, the results are also considered against the background of research presented in chapters three and four, including relevant findings that support this investigation. The results from the personality measure, the NEO PI-R link to the internal route of personality, whilst the results of the Health Behaviour measure, the HBC, are part of the external behavioural route of personality. The limitations of the present study will then be highlighted and recommendations for future research will be noted.

However, before commencing with a discussion of the results, it seems pertinent to emphasize the context in which this research has been carried out and this is the topic of section 7.1.

7.1 Quantitative versus qualitative approaches

One of the major consequences of the shift in conceptual framework away from a linear, Newtonian view of the world towards a more holistic paradigm, has been the realization that mind and body are inextricably interconnected. This has not only highlighted the psychological dimension as a legitimate factor in the unfolding of
health and illness but also created a greater awareness of the need for whole-person care. Using the metatheoretical framework of the biopsychosocial model, this study tries to transcend traditional unidimensional approaches to the mind-body relationship by considering the cause, development and maintenance of irritable bowel syndrome in the light of the complex interaction between biological, psychological and social factors. Rapprochement between the Newtonian and holistic perspectives has also been integral to this investigation. The Newtonian aspect is captured by the quantitative methodology of the study, which uses statistical methodology to examine the relationship between the variables of the quantitative psychometric measures. The holistic aspect however, allows a far broader leeway in the interpretation of data than does the Newtonian perspective, and is included in the discussion of the results in section 7.2.

7.2 Discussion of results
The results regarding the role of personality in IBS as measured by the NEO PI-R, are part of the internal route of personality and reveal statistically significant differences between Group 1 (IBS) and Group 2 (Non-IBS), which were noted across three of the five variables, namely Neuroticism, Extraversion and Openness to Experience. These differences will be discussed in section 7.2.1. The next section 7.3.1, discusses the results from the HBC as an aspect of the external behavioural route of personality, where the statistically significant differences between the Additional Items, the Wellness Maintenance and Enhancement and Traffic Risk Taking subscales are examined in greater depth.

7.2.1 The internal route of personality: stress, emotional dysfunction and the NEO PI-R results
As the internal route of personality links to the internal physiology of individuals, it incorporates the stress, emotional dysfunction and the temperament of persons as expressed by the five basic domains of personality.

7.2.1.1 Neuroticism
The IBS group's highly significant score on Neuroticism ($X=112.617$) supports the large body of evidence that high scorers on this dimension are more susceptible to psychological distress (Costa & McCrae, 1992; Esler & Goulson, 1973; Langeluddecke, 1983). The experience of physiological disturbance as the result of emotional arousal or distress is virtually universal. Sweating, trembling, palpitations, rapid pulse, flushing, nausea and diarrhea are only some of the reactions that reflect
the powerful and immediate link between mind and body (Costa & McCrae, 1987). This is congruent with the results of Wilson's (1997) recent research on IBS and psychopathology, where the typical female IBS patient is portrayed as being significantly anxious, sensitive and emotional, prone to ruminative worrying and generally tense and overwrought. In terms of research reported by Ormel and Wohlfarth (1991), temperamental dispositions are more powerful than environmental factors in predicting psychological distress and hence, it appears that those high in Neuroticism tend to experience more distress over time regardless of the situation.

In line with this domain of traits, persons suffering from IBS are thus not only subject to more negative emotionality, but more prone to have unrealistic or irrational ideas and less able to control their impulses (Costa & McCrae, 1992). In addition, not only are these individuals more vulnerable to psychological stress but they also tend to cope more poorly with stress. Thus, as Watson and Clark (1984) suggest, people high on negative affectivity tend to be particularly sensitive to minor failures and frustrations and irritations of daily life, as evidenced by the likelihood, magnitude and duration of their reactions. This finding is supported by Bolger and Schilling (1991) who found stressor reactivity to be twice as important as stressor exposure in explaining the neuroticism-distress relationship.

In terms of the relationship between Neuroticism, health problems and health care utilization, the literature reveals that elevated scores on this subscale tend to indicate vigilance regarding bodily changes, a greater awareness of symptoms which appear to be characterized by unusual attributes, as well as a greater preoccupation with the contraction or development of diseases (Fullwood & Drossman, 1995; Costa & McCrae, 1992). Based on the often restrictive nature of the physical symptoms of IBS, this pre-occupation with their physical condition is understandable from those suffering from IBS. Given that IBS ranks second only to the common cold as a cause for absenteeism from work (Els et al., 1995), the detrimental impact on daily functioning and preoccupation with their health and physical functioning is to be expected.

However, this extreme vigilance over bodily functions and symptoms is supported by the large body of evidence (Costa & McCrae, 1987) which shows that individual's high in Neuroticism generally report more medical complaints. As literature over the years has shown, subjective and objective views of health are not isomorphic, in part, because subjective bodily perceptions are systematically biased by Neuroticism. This
is supported by research showing that IBS patients are higher in measures of psychopathology (Whitehead et al., 1988). The issue of somatic complaints, health-care reporting and medical utilization is still unclear around IBS subjects in general, and it is still little known whether IBS is a true psychosomatic disease or whether it is best conceptualized as a version of the sick role adopted by a set of individuals high in Neuroticism and hence emotional distress (Costa & McCrae, 1987). However, what is of major concern is that the ambiguous nature of IBS symptoms may leave IBS sufferers vulnerable to being dismissed and labeled as hypochondriac, without being referred for the appropriate psychological help. It also may lead to an inappropriate disregard of complaints from highly neurotic individuals who also happen to be seriously ill. The challenge is to strike a balance between subjective and objective symptom reporting and to ensure that the individual is sensitively dealt with and appropriately referred for psychological help if necessary, rather than being dismissed as a hypochondriac.

Lastly, whilst Neuroticism is intimately linked to health perceptions, it is also indirectly related to health through a variety of maladaptive behaviours and health behaviours. In this regard, a study by Pulkkinen (1992) revealed that Neuroticism was the most relevant personality trait in determining lifestyles. These authors found that individual's with antisocial lifestyles compared with socially adaptable lifestyles were higher in Neuroticism, more pessimistic and more often problem drinkers. Generally, higher Neuroticism scores were accompanied by higher emotional susceptibility scores indicated by life attitudes and a weaker self-control indicated by particular health and leisure behaviours. Although there did not appear to be higher alcohol abuse amongst the group of IBS subjects in this study, the higher Neuroticism score is certainly congruent with the greater emotional susceptibility and distress and weaker self-control, as will be seen in discussion of some of the health behaviour dimensions such as the Additional items and Wellness Maintenance and Enhancement.

7.2.1.2 Extraversion
A statistically significant difference was found to exist between the two groups with regard to the Extraversion dimension, with the IBS group (X=101.15) scoring statistically significantly lower than the Non-IBS group (X=111). In the first instance, this finding suggests that IBS sufferers prefer to do many things alone or in small groups, that they avoid large noisy gatherings and tend to be quiet and reserved in social interactions (Costa & McCrae, 1992).
In the second instance, these results suggest that IBS sufferers are not as happy or satisfied with life compared to those demonstrating high scores in Extraversion. Based on the notion that psychological well-being carries with it the connotation of mental health and given that the inverse of Extraversion is emotional inhibition, research in this area clearly demonstrates that habitually inhibiting emotions can pose a threat to physical and emotional health (BBS Task Force, 1996; Deary & Matthews, 1993). The phrase “psychological well-being” carries with it the connotation of mental health. However, as Costa and McCrae (1980) point out, although positive and negative carry the strong mathematical suggestion of being opposite, it has been found that positive and negative affect are independent predictors of general happiness and life satisfaction of individuals.

The combination of the low Extraversion or emotional inhibition and high Neuroticism of the IBS group in this study suggests a reliance on a neurotic style of coping that is characterized by avoidant or passive reactions where emotions are suppressed and the self is blamed (Costa & McCrae, 1992).

7.2.1.3 Openness to Experience
The difference discerned between the two groups with regard to the Openness to Experience dimension would seem to suggest that the IBS group (X=112.55) is more predisposed to conventional behavioural patterns, demonstrating a conservative approach to life (Costa & McCrae, 1992). Such individuals show a preference for the familiar rather than the novel and tend to be resistant to change. Their significantly lower score on this dimension also suggests inflexibility in their emotional responses and coping repertoires that veers away from the necessary variety and range of responses that define health as the balance of complexity.

7.2.1.4 Agreeableness and Conscientiousness
Although some literature (Wilson, 1997) has shown IBS patients to be more aloof, distant, suspicious and cynical, there was no significant difference between the two groups on the Agreeableness dimension of the NEO PI-R. (IBS group X=117.883; non-IBS group X=112.45). Whilst their level of Extraversion indicates that the female IBS subjects have reduced quantity of social interactions, their scores on the Agreeableness dimension suggests that the quality of these relationships is no different than the non-IBS subjects.
Similarly, in terms of the Conscientiousness dimension, no significant difference between the two groups could be discerned (IBS group \( X=118.617 \); non-IBS group \( X=115.217 \)). It appears that the IBS patients perceive themselves to be as persistent, industrious and organized as the subjects of the control group. The lack of significant difference either way is surprising. On the one hand, considering that IBS sufferers tend to be more impulsive generally, it was expected that they would possibly be lower in their Conscientiousness scores than the control group. At the other extreme, very high levels of Conscientiousness can be associated with annoying fastidiousness and compulsivity, which would accord with the typical IBS patient's over-attention to their bodily processes and functions.

However, the fact that this investigation is only concerned with the broad trait domains and not the individual facets of these domains, has probably flattened the profile of the subjects in the way that averages tend to do. It is very possible that the IBS female subjects could have scored higher or lower on particular facets of Conscientiousness. A higher score on the facet of Compliance would accord with their eagerness to co-operate with others and to deny their own needs and feelings. A lower score on the Competence facet would also make sense given its association with self-esteem and locus of control. A lower score on Self-Discipline would support the IBS female subject's lower score on daily health habits.

7.2.2 The external route of personality: health behaviours and the HBC results

The external route of personality is essentially a behavioural one and incorporates lifestyle and health behaviours such as those measured by the HBC.

7.2.2.1 Additional Items

There was a highly significance difference between the two groups in terms of the Additional Items subscale of the HBC, with the IBS group \( X=24.45 \) scoring much lower than the control group \( X=42.883 \). As the Additional Items subscale includes the 14 filler items that refer to daily health habits, it appears that the IBS group are not as diligent as the control group as far as getting regular sleep, avoiding over-the-counter medications, using seat belts, eating a balanced diet, gathering information on things that affect their health, driving after drinking and brushing their teeth regularly. The Additional filler items consists of a mixture of the four broader health dimensions used. The lower score of the IBS group suggests carelessness to daily health behaviour that most of the control subjects seem to take forgranted as a basic health practice. This may well be linked to their higher level of psychological distress.
and the fact that they cope more poorly with stress and hence are more inattentive to daily health practices. When persons are stressed, not coping with the stress and in addition manifesting negative affect, the chances are that they have minimum energy and attention over to expend on worry about daily health habits. They probably are not getting good quality sleep, not eating as they should be, perhaps neglect putting on seat belts, probably using more over the counter medications and possibly drinking and driving more.

7.2.2.2 Wellness Maintenance and Enhancement
The IBS group scored significantly higher (X=34.683) than the non-IBS group (X=32.6) on Wellness Maintenance and Enhancement behaviours. These preventive behaviours such as flossing, taking vitamins, exercising, limiting unhealthy foods, gathering information on things that affect their health, seeing their doctors regularly; are all behaviours that could, when taken to the extreme, indicate an over-attention to their health and bodily functions and health care. On one level it is contradictory in that the IBS group do not also accord the same level of attention to their daily health habits. On the other hand, it is easy to see how daily health habits could become neglected over and above becoming almost obsessed with other aspects of their bodily functions, indicating a lack of balance between the two.

7.2.2.3 Traffic Risk Taking, Accident Control and Substance Risk Taking
The lack of a significant difference between the two groups with respect to the Accident Control dimension (IBS groups X=19.617; non-IBS group X=18.583) suggests that the IBS group of females is just as careful or careless as the control group of women about such concerns as fixing things around the house, keeping emergency phone numbers on hand and ensuring that they have first aid kits available. There was no significant difference between the two groups with respect to the means of the two groups on the subscale of Traffic Risk Taking (IBS group X=118.967; non-IBS group X=119.4), suggesting that they take the same chances with traffic behaviour such as driving fast and not wearing seat belts. Given their greater impulsivity as part of the Neuroticism dimension, it would have been in character for the IBS group to demonstrate greater risk taking and more dangerous, less controlled road behaviour. Similarly with the Substance Risk Taking dimension (IBS group X=114.217; non-IBS group X=113.033), it would not have been unusual for the IBS group to demonstrate greater susceptibility to unhealthy behaviours like smoking and alcohol consumption as some studies have shown.
However, the lack of any significant differences in these three health behaviour domains may be due to the fact that many of the respondents misinterpreted the point of the Health Behaviour Checklist. After discussion and feedback of results with many of the subjects it appears that instead of responding with the behaviours that they actually do in their daily lives, particularly in the past 6 months, many replied in accordance with what they believed they should be doing. This discrepancy between what they would like to do and what they actually do in their daily lives could have been a significant factor biasing the results in these domains. In addition, perhaps it was more difficult being totally honest on these three dimensions than it was on the other two that involved the less innocuous activities of daily and preventative health habits.

7.2.3 Discriminant analysis results
Based on the results of the discriminant classification function performed on all ten variables of the NEO PI-R and the HBC combined, four variables emerged as contributing 83.3% of the total variance. In order of importance, the Additional Items subscale of the HBC made the largest contribution, followed by the Neuroticism dimension from the NEO PI-R and the Wellness Maintenance and Enhancement and Traffic Risk Taking subscales of the HBC.

Essentially, 83.3% of the female subjects were classified correctly on the basis of their results on these four variables. Although these instruments pose as a useful means of identification, it would be interesting to see what level of discriminant analysis would apply in the identification of male sufferers.

Given the large percentage of female sufferers correctly identified in this investigation, the question now turns to what sort of personality profile emerges from these findings and those of other researchers on the RAU Psychogastroenterology project? The following case vignette in section 7.2.4 attempts to answer this.

7.2.4 Case vignette
Based on the results of this investigation into the personality-gut relationship and of those obtained from other researchers on the wider RAU project, certain psychosocial features may be typically associated with women suffering from IBS. In order to understand more about the whole person herself, these psychosocial features will be interpreted within the holistic framework of the biopsychosocial model.
The average IBS patient identified in this project may be described as a white middle-class married woman, aged between thirty-five and forty-four years and often with two or three children. She is relatively well educated, works in a variety of full-time occupations, probably within the business sector of the community, and regards religion to be an important part of her life. The question at this point would be: "why is she suffering from IBS and not one of the other chronic, psychosomatic disorders like migraine, asthma or hypertension?"

In terms of the physiological domain of functioning, she probably has a constitutional vulnerability that predisposes her to dysfunction in the gastrointestinal system. This bodily weakness could either be inherited or develop as the result of disease in that area. The activation of her susceptibility, and the consequent intensity and range of symptoms, will be shaped by a variety of psychosocial moderating factors during the course of her life. These factors, such as her personality, the amount and quality of stressful life events, her ability to cope with these events, as well as the influence of her family, the society and the type of environment in which she lives, will determine whether she will seek health care for her symptoms and whether they are mild, moderate or severe.

Temperament is that part of the physiological domain of functioning that describes her inherited behavioural and emotional tendencies. As indicated in the results of this study, the trait profile of the typical female IBS sufferer suggests she experiences more emotional distress and negative emotions such as fear, anxiety, anger, hostility and sadness. She is also prone to the irrational and disturbed thoughts and behaviours that accompany her emotional distress. Her tendency to inhibit her feelings and emotions can pose a threat to both her physical and mental health. The fact that she is more resistant to change and prefers the familiar to the novel suggests greater emotional rigidity defined by repetitive and dysfunctional patterns of responding that reflects either extreme suppression or extreme expression of emotion.

Her higher levels of reactivity and emotionality have substantial repercussions in her psychological and social domains of functioning. As the link between the mind and body (Pert, 1997), emotions communicate information about the self and others. From the psychological perspective of the self, this woman is generally out of touch with her own emotions, needs and feelings. Her tendency to focus exclusively on her bodily functions and symptoms at the expense of her psychological needs means
that she is more likely to somatize her emotional distress and is hence more prone to psychosomatic or functional conditions like irritable bowel syndrome.

Furthermore, her tendency to experience more negative emotional states means that she is more susceptible to psychopathological conditions like the anxiety, mood, panic and eating disorders. Based on her inability to describe her feelings she may also be described as alexithymic. The continuities with psychopathology exist not because psychological disorders are synonymous with emotions, but because particular emotions are evident in certain disorders, such as sadness and fear with depression and anxiety disorders. In addition, she not only tends to have a history of physical and/or sexual abuse, but often displays learned illness behaviours that influence her need to report and seek care for her symptoms.

*Another significant mediating factor* shaping the pattern of interaction between this woman's different domains of functioning is her *perception and experience of stress*. Based on her higher levels of emotionality and reactivity, she is predisposed to perceive and respond to life stress in a certain way. Life is generally experienced as more burdensome, and marked by more daily hassles and adverse life events that involve loss and chronic difficulty. However, as many researchers are emphasizing, it seems to be not so much the excess stress per se, but rather the meaning she attaches to it, together with her reduced ability to cope effectively.

Her tendency to ignore and sublimate her own needs in favour of those of her family and friends, is partly linked to her emotional inhibition, and partly associated with her low self-esteem (Wilson, 1996). This sees her opting for more unhealthy defense mechanisms and more neurotic styles of coping characterized by conflict-avoidant or passive reactions where she tends to blame herself (Mayer, 1997). She shows reduced complexity and flexibility in her coping repertoire by relying largely on emotion-focused and avoidant styles of coping that involve suppressing her conscious recognition of feelings and even biological needs. This can in turn lead to sustained emotional distress and reactions that can be connected to chronic disruptions in her physiological functioning, particularly in the region of the gut. This chain of events is particularly important because as studies show, choices of coping strategies influence the emotional outcome of stressful events.

In terms of the *sociological domain of functioning*, she usually has a more restricted network of support that may negatively affect her health. Through facial expressions 

and voice tones, emotions function to promote certain kinds of actions in others. It seems as if her greater reserve in social interactions, together with her typical rigidity in emotional responsiveness towards others, may inhibit her ability to build substantial and effective support networks.

From the behavioural perspective, health habits are also a significant mediating factor that may also shape her overall quality of life. As revealed by this study, this woman is not as diligent as the non-IBS sufferers are in getting regular sleep, avoiding over the counter medications and eating a balanced diet. Her neglect of daily health habits such as not using seat belts regularly, forgetting to brush her teeth on a daily basis and possibly drinking and smoking more, are congruent with her emotional impulsivity, weaker self-control and reduced sense of self-efficacy. However, although she tends to neglect her daily health habits, she is more attentive than the average person to her preventative health behaviours. This is congruent with the hypervigilence she displays towards bodily symptoms and functions, that she collects substantial information on her condition of irritable bowel syndrome, that she tries to exercise regularly, takes vitamin supplements and sees her doctors often.

Although physically and emotionally debilitating, it appears that these women use their IBS symptomatology to help them cope in their daily lives by providing an internalized outlet for their stress. However, this comes at the cost of emotional lability and instability, unhappy interpersonal relationships and a relentless focus on the gut as a metaphor for the imbalance and emotional distress they experience. It appears as if irritable bowel syndrome is one of the many ways personality manifests through the body and reflects the interaction between the physical, psychological and social domains of functioning.

The next section 7.3 addresses the limitations inherent in the study.

7.3 Limitations of the study
This study produced some useful and interesting findings regarding the relationship between health behaviours, personality and IBS. However, despite the fact that every effort was made to ensure methodological soundness, there are inevitable shortcomings and limitations, which need to be considered when interpreting the data.
7.3.1 The selection procedure
One possible limitation refers to the nature of the selection procedure used in the study that has probably produced a self-selected sample of IBS sufferers, specifically, those seeking health care for their symptoms. Whilst this may not necessarily in itself be a limitation, it is important in the light of the fact that the majority of persons suffering from IBS do not seek help for their symptoms (Blanchard et al., 1987). In addition, the literature also notes that those persons with IBS seeking health care, display higher levels of psychopathology and are generally more psychologically distressed than those IBS sufferers who do not seek medical help (Drossman et al., 1982; Whitehead et al., 1994). This self-selection hypothesis has implications for the results of the study in that it may well limit the generalizability of the findings to a specific subgroup of IBS sufferers, those who seek health care and hence may not be applicable to IBS sufferers in general.

7.3.2 The Sample demographics: gender, race and religion
A second limitation of the study may concern the type of subjects selected and targeted in terms of gender and race. With respect to gender, although the international research notes that fewer men than women report IBS symptoms in western industrialized nations (Drossman & Thompson, 1992; Farthing, 1995; Prior, 1995), this may not be entirely appropriate to the South African context given the current rapid pace of social transition. In this regard, the downsizing, affirmative action, privatization and retrenchment programs currently in progress are creating a rapidly changing job market and high rates of unemployment, affecting women and men alike, but particularly men. These trends imply raised stress levels, an accompanying increase in psychological distress and hence greater chance of both men and women somatizing the stress and psychological distress through psychosomatic disorders such as IBS. This in turn may mean an increase in men, rather than just women, seeking health care in the near future, particularly in the South African situation.

Race as a variable in the study may also be a factor limiting the generalizability of the findings. The restricted advertising of the IBS Project to particular magazines, newspapers and areas within the country, means that only a narrow section of the South African population was targeted, namely white, Afrikaans speaking women. Extending the range of the project by incorporating a more ethnically and gender diverse context may produce very different findings, given that social and cultural factors may influence the expression, prevalence and reporting of IBS (Thompson &
Hawkey, 1995). Furthermore, IBS is not just a "white person's disorder" but occurs to a limited extent in rural contexts, although it is more common in industrialized areas (Olubuyide et al., 1995) where it affects an increasing number of black people.

Religious adherence may well have also played a role in limiting the generalizability of this study's findings. As indicated in Chapter 5, religion proves to play a more important role in the lives of the IBS subjects participating in this research study than for the control group. This may have biased results given that the two groups were not equally matched on this particular variable. Other variables not controlled for such as migraine, heart disease, asthma or diabetes may also have biased the findings in some way. Further research could possibly refine the biographical questionnaire by building in such factors and maybe by asking for greater religious specification.

7.3.3. Selection Instruments
A third limitation is related to the measuring instruments used. Although the NEO PI-R is a well standardized personality inventory in the Unites States of America, it has unfortunately not yet been standardized for use in South Africa. However, the decision was made to rather select a suitable personality measuring instrument with adequate reliability and validity that had at least been standardized for a comparable western society population. Hence, part of the decision to restrict the study to white subjects is based on this factor. Nevertheless, the ideal would be to ensure that any measuring instruments used in future are standardized for the diverse South African population. Although the Health Behaviour Checklist was also not standardized for the South African population, in retrospect, this was not a particularly good health behaviour measuring instrument, as not enough research has been conducted with it. This may have influenced results, particularly it's contribution to the variance between the two groups. Perhaps using only the one measuring instrument, NEO PI-R, may have produced purer results and findings with greater generalizability.

7.4 Recommendations for further studies
Based on the above discussion of the limitations of the study, the following recommendations are proposed for further studies of this nature:
A larger, more culturally diverse sample of both men and women particularly focused at Black, Indian and Coloured populations may throw more light on the nature and expression of IBS in the South African context.

Given the rapidly changing economic and social demographics of South Africa, further studies could be targeted at exploring relationships between post traumatic stress disorder and IBS, as well as retrenchment and IBS.

Given the high rate of stress and psychological problems amongst those with poorer social networks and social support, further IBS studies could explore this particular link and its role in psychosomatic illness. This seems particularly pertinent to the South African context, which may be taken as an example of a highly mobile society where family links are rapidly disintegrating and where isolated nuclear family units are becoming one of the most common family forms.

As no studies to date have been conducted on IBS and locus of control, a study investigating whether any significant differences exist between internal and external locus of control and IBS would contribute towards general knowledge of the disorder and may cast light on specialized interventions for treating and managing IBS.

As the NEO PI-R yielded interesting results on the link between broad personality dimensions and IBS, further in-depth studies focused on the trait facets, could obtain more knowledge of the personality traits of IBS sufferers that will provide more detailed and custom designed interventions with a higher degree of success.

Investigation into the link between IBS and more holistic and integrative personality concepts such as Antonovsky's "Sense of Coherence" and Kobasa's construct of "Hardiness", would be an opportunity to address the mind-body link from a truly salutogenic perspective. Attention would then be focused on the role of strengths and competencies in the IBS illness process.

Lastly, a shift towards more qualitative or social constructionist approaches to studying IBS is highly recommended, particularly using a narrative approach to elicit personal and subjective experiences of IBS sufferers. Such an approach would complement the numerous quantitative studies already done by providing greater insight into the disorder and it's impact on individual lives. A more subjective, qualitative approach may also offer a range of different strategies for empowering persons to take control of their illnesses and lives.
7.5 Summary and conclusion

Although previous studies on the personality-gut relationship, as representative of the mind-body interface, have yielded contradictory and ambiguous findings, this study supports the emerging trend of evidence indicating the tendency for a select group of IBS sufferers to experience higher levels of psychopathology and emotional distress. Rather than revealing a typical personality pattern unique to IBS patients, this study, along with other relevant research, suggests that a certain group of IBS sufferers, those who report and seek help for their symptoms, display a more generic "distress-prone" personality pattern (Booth-Kewley & Friedman, 1987). This pattern is characterized by the tendency to experience more negative emotions such as fear, anxiety, depression and hostility; to perceive more stressful life events, and by a greater inability to cope with the stress generated by these events. These tendencies, together with the proclivity towards the somatization of distress, highlights the internal route whereby personality mediates the mind-gut relationship. Greater insight into IBS sufferers' standing on dispositional variables such as those used in this study may contribute towards understanding their susceptibility to stress, their coping strategies as well as their tendency to experience more negative emotions, and so help in the management of IBS and in the designing of interventions that are more suited to individual needs.

As the results show, a second way in which personality may influence individual health and illness is through the external behavioural route. Although the mechanisms are still largely unknown, there does seem to be some sort of link between personality and the lifestyles of some IBS sufferers, particularly in certain dimensions of health behaviours. That there exists a certain group of IBS sufferers, displaying a certain pattern of personality traits is also particularly relevant in light of the fact that IBS is a chronic disorder of lifestyle. The implications are that by understanding the external route through which personality operates, suffering can be substantially alleviated by addressing certain aspects of behaviour. Reducing stress, eating appropriately and limiting intake of cigarettes, alcohol and other drugs, introduces a preventative and salutogenic emphasis; one that highlights the role of individual responsibility and the choices involved in resisting illness and enhancing health.

Despite the limitations of the current study, the results obtained on both the internal and external routes of personality are extremely promising. They have made some contribution towards understanding how personality can mediate the mind-body
relationship and can influence individual functioning in terms of the gut, and how this can in turn influence illness and health. Interaction between the two routes of personality was also highlighted as a part of the biopsychosocial model. In challenging the exclusive emphasis on one domain of functioning such as the biological to the neglect of other domains such as the psychological and social, the biopsychosocial model conceptualizes the development of IBS as a multicausal process whereby both physiological and psychological processes are operative. However, given the complex relationships between the various domains of functioning, and the lack of clarity regarding the pathways and mechanisms linking psychosocial factors to illness and health, it is likely that these connections are nonlinear, multifactorial and change over time.

Lastly, what has also been highlighted in this study is that the shift away from the biomedical model as the dominant model of disease, towards a more holistic or systems view, not only offers a clearer concept of the nature of functional disease, but suggests a more humane approach that takes greater cognizance of the complexity of whole-person functioning. This will hopefully in turn, open up a niche for psychologists as collaborators in the biopsychosocial interface in medicine, for, as Pert (1997) points out:

"In the end I find I can't separate brain from body. If one just takes into account the DNA directing the dance of peptides, body is the outward manifestation of the mind."
Bibliography


