THE RELATIONSHIP BETWEEN INDIVIDUAL VARIABLES AND ATTITUDES TOWARDS THE PERSONAL USE OF COMPUTERS

by

CHRISTOPHER DUNCAN WADDELL

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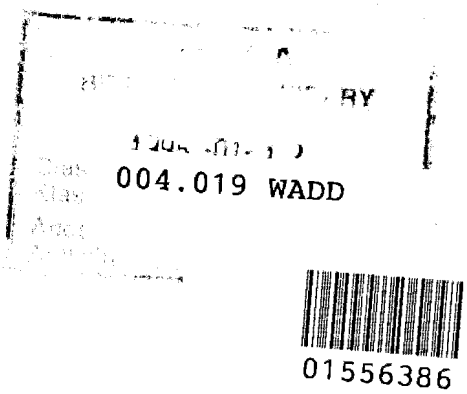

SUMMARY

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CHRISTOPHER DUNCAN WADDELL

SUPERVISOR: PROF C.M. TUSTIN
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In current times, to function successfully in the work environment, the ability to use a computer is essential. The introduction of computers into organisations has often met with resistance. The reason for this resistance must be identified and overcome if businesses are to realise the productivity gains of full computer usage.

On the basis of the abovementioned problem the objective of this study is to test the relationship between age, sex, locus of control and personality type and attitudes toward computer use.

A theoretical investigation was carried out to gather information on the variables under study which was used to compare with the results of the empirical study.

From this study of 68 white collar respondents from a financial institution it can, in general, be concluded that peoples' attitude toward the personal use of computers is positive and not affected by the individual variables tested.

Key terms:

Computer attitudes; Computer attitude scales; Age; Gender; Locus of control; Personality type; Myers-Briggs Type Indicator.

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CHAPTER 1

BACKGROUND TO THE STUDY

1.1 INTRODUCTION

In this day and age computers form an integral part of everyday lifestyles. An important area of this lifestyle is the work environment. It is here, particularly, that the ability to be able to use a computer is essential to function successfully within this environment.

Most computers are found in business and industry and modify job tasks, job opportunities and work environments (Coovert & Goldstein, 1980). Organisations have increasingly come to rely upon computer based information systems to support their day-to-day operations as well as assisting with decision making (Hawk, 1989).

With the potentials and wonders of the use of micro-computers being constantly touted before us, mixed reactions are obvious (Widmer & Parker, 1983). To some, the computer is a tool, a game, a marvel, an instrument to be explored and exploited (Widmer & Parker, 1983). Others view the computer as a threat to their self-esteem and possibly their jobs (Widmer & Parker, 1983). Still others feel unsure, curious about computer use, but uncertain of where or how to start their investigations (Widmer & Parker, 1983).

The importance of computers in our society makes it vital that a thorough understanding of their psychological effects on the user is developed (Cohen & Waugh, 1989).

1.2 NECESSITY OF THE STUDY

It has been found in many organisations that the introduction of computers into organisations has met with resistance (Howard, 1986). The reason for this resistance must be identified, and its causes corrected, if businesses are to realise the productivity gains that could result from full acceptance of computer usage by all individuals (Howard, 1986).

With the increasing pervasiveness of computers in management, there is corresponding pressure for managers to understand and become familiar with computers and the opportunities they provide. Changes in information technology will have a significant impact on the people in an organisation (Geurin & Kohut, 1988). The advent of computers is having important implications in the job market and in the field of education (Levin & Gordon, 1989). Those who were educated prior to the computer revolution are finding it difficult to adapt to the rapidly changing environment (Geurin & Kohut, 1988). Because of the rapid development of this technology, many people are unfamiliar with computers and anxious about the impact they will have on their lives (Levin & Gordon, 1989). Adaption requires them to unlearn manual approaches to decision making and problem solving and relearn computer based methods. Failure to do so may result in the loss of valuable management talent and furthermore, the personal costs of being "washed up at forty" are immeasurable (Geurin & Kohut, 1988).

Computerphobia, fear of computers, first gained attention early in the 1970's (Bloom, 1985). Today industries rush to get on the computer bandwagon and put intense pressure on some individuals to learn about computers (Bloom, 1985). These pressures

sometimes result in anxiety and resistance to the technology (Bloom, 1985).

Often this resistance has to do with attitudes towards computers. People often ask questions such as the following: Are computers more clever than people? Do they have feelings of love and hate? Can they think for themselves? Can they outwit humans? Can they replace people at performing everyday? Will they run the world and make slaves of human beings? (Spencer, 1974). This resistance and negative attitude towards computers may simply be a lack of knowledge about and awareness of the capabilities of computers (Howard, 1986). A second source of resistance may be an innate fear of computers (Howard, 1986).

Some common fears are: breaking the computer or making costly errors; looking stupid; error messages; working with a powerful other; documentation; losing control; lack of time and disappointments due to expectations (Bloom, 1985.)

According to Weinberg (1980) physical reactions to computer anxiety appear frequently (Howard, 1986). In fact subjects have shown severe symptoms including nausea, vertigo, stomach aches, hysteria and cold sweats and shown clear anxiety when operating computer terminals (Howard, 1986). It appears, therefore, that computer anxiety does exist and that it is widespread and that its impact on organisations is significant (Howard, 1986).

Use of micro-computers by professionals and managers appears to be limited due to the prevalence of computer anxiety or fear of computers and negative attitudes toward computers in general (Igbaria & Chakrabarti, 1990).

Computer anxiety has been suggested as a possible explanation for the tendency of some managers to sidestep direct involvement with computers, by delegating computing tasks to technically literate subordinates or avoiding computing altogether (Howard & Smith, 1986). Our dependence on computers is broad, deep and intensifying (Shore, 1987). This fact causes anxiety, anxiety about using computers, anxiety about dealing with computers and anxiety about the effects of computers on society (Shore, 1987). Computer anxieties are real and they add psychological and sociological dimensions to the spread of computer technology (Shore, 1987). This computer technology places new demands on people (Hudiburg, 1989). Some persons may experience difficulties in dealing with these demands and may experience stress (Hudiburg, 1989). This fear could cause a barrier to attitude change about computers (Howard, 1986). It is, therefore, important to find out if there are any individual variables that can be significantly correlated with attitudes.

Why is this important to know? Organisations have increasingly come to rely upon computer based information systems to support their day-to-day operations as well as providing decision making assistance to their managers (Hawk, 1989). Our gradual acceptance of them as a useful tool may evolve eventually into a positive view of micro-computers as an essential ingredient in our quest to make our lives fuller and richer (Kuhn, 1989). Although much knowledge has accumulated on the subject of how to develop and successfully implement computer based information systems, many of the systems developed end up as failures (Hawk, 1989). A key factor affecting the success of an information system is the attitude of the people who use it (Hawk, 1989). Computers are major factors in our society (Kuhn, 1989). They are a tool that permeates many

aspects of our lives including our education and careers (Kuhn, 1989). The attitude of adults toward computers is a key issue (Kuhn, 1989). According to Hawk (1989), past research indicates that the computer attitude of users impacts the degree to which they use a given computer based information system (Baroudi, Olson & Ives, 1986; Robey, 1979; Swanson, 1974). Computer competence, therefore, will become requisite to participation and success in many aspects of modern life, particularly the occupational sphere (Ogletree & Williams, 1990). Mild to severe discomfort with computer technology interferes with personal and professional choices (Weil, Rosen & Wugalter, 1990). This can affect an individual by putting promotions and advancements at risk and new job possibilities become limited (Weil et al., 1990).

The ability of organisations to incorporate computer technology into the managerial work environment impacts on organisational efficiency and effectiveness (Geurin & Kohut, 1988). The use of personal computers radically alters relationships between information systems/data processing specialists and managers and improves decision making, reduces response time and improves long range planning (Geurin & Kohut, 1988).

A myth surrounding modern technology is that computer experience will eliminate computerphobia (Weil et al., 1990). Experience alone will not eliminate computerphobia and in many instances will exacerbate the existing problem (Weil et al., 1990).

Many factors are likely to influence an individual's response to the use of computers and as computer usage becomes more widespread and more diverse it is likely that it will become increasingly difficult to both identify such factors and establish the relationship between

them (Siann, Macleod, Glissov & Durndell, 1990).

It is for these reasons that research is necessary to establish the relationship between individual variables and attitudes towards the personal use of computers. If this relationship can be established it may just be possible to reduce the incidents of computer fear and thus provide for a better modern work environment.

1.3 AIM OF THE STUDY

As follows from the reasons for undertaking this study, the aim of the study is to establish the relationship between certain individual variables and attitudes towards the personal use of computers.

More specifically the individual variables to be studied are as follows:

(i) age;
(ii) sex;
(iii) locus of control, and;
(iv) personality type.

1.3.1 Hypotheses

The hypotheses to be investigated are:

1.3.1.1 Older people will have less favourable attitudes toward using a computer than younger people.

1.3.1.2 Women will have less favourable attitudes toward using the computer than men.

1.3.1.3 External locus of control persons will have less favourable attitudes toward using a computer than internal locus of control persons.

1.3.1.4 Persons with a specific personality type will have less favourable attitudes toward using a computer than other personality types.

1.4 SCOPE OF THE STUDY

The scope of this study is limited to the responses of a random sample of 68 persons taken from the organisation within which the researcher works.

The sample includes persons from all levels and divisions of the organisation, both male and female. It is not restricted to a certain management level or a particular group.

For the purposes of this type of limited study the sample chosen will be quite suitable.

1.5 OVERVIEW OF THE STUDY

The balance of this study will consist of five chapters. Chapters 2 and 3 will complete Section A of the study, that being the theoretical investigation.

Chapter 2 will be a selective literature review on computer attitudes. This chapter will review various aspects affecting computer attitudes as well as the close relationship between computer anxiety and attitudes towards computers. It will also review the various scales

that have been used to measure computer attitudes.

The third chapter will be a selective literature review on the four variables under study. The findings with regards to age will be reviewed first. A review of the findings with regards to sex will follow to highlight the differences in male and female attitudes towards the personal use of computers. One of the components that affects a person's performance - to - outcome view is that of internal - external locus of control (Coovert & Goldstein, 1980). Locus of control will be the third variable to be reviewed in this chapter. There are obviously several personality variables which enter into workers' perceptions and handling of job related changes caused by computers (Coovert & Goldstein, 1980). Personality type is the fourth and final variable to be reviewed in this chapter.

Section B of the study, that being, the empirical investigation, will also consist of three chapters. The first of these, chapter 4, will set out the method of the investigation and will describe specifically the strategy used for the research and the elements making up this strategy. Chapter 5 will cover the results of the study and a discussion thereof with regards to the existing literature in this regard. Finally, Chapter 6, will be the closing chapter in which, firstly, any conclusions that can be made from the study will be highlighted and, secondly, recommendations on the research problem will be made.

CHAPTER 2

A SELECTIVE LITERATURE REVIEW OF COMPUTER ATTITUDES

2.1 INTRODUCTION

This chapter is a selective literature review of computer attitudes. This review begins with a look at the various aspects that affect computer attitudes, how these attitudes are defined and the close relationship between computer anxiety and attitudes towards computers. Secondly, various computer scales that have been used to measure computer attitudes are reviewed. Finally, the findings of the various studies are reviewed.

2.2. ASPECTS OF COMPUTER ATTITUDES

Attitudes toward computers are thought to influence not only the acceptance of computers but also future behaviours, such as using a computer as a professional tool (Woodrow, 1991). For this reason, the promotion and maintenance of positive attitudes toward computers is of paramount importance (Woodrow, 1991). Negative attitudes must not be allowed to limit the knowledge and creativity of potential computer users (Woodrow, 1991). The feelings of stupidity, fear of obsolescence, fear of the unfamiliar and a belief that machines have a dehumanizing effect can contribute to negative attitudes (Dambrot, Watkins-Malek, Silling, Marshall & Garver, 1985).

Computer anxious individuals can be found among groups of computer professionals, accomplished hackers, technologically oriented users and students, and computer science majors as well as in groups such as art majors and other computer novices where high computer anxiety would be expected (Howard, Murphy & Thomas, 1987).

The emergence of computers, particularly the introduction of the personal and professional micro-computers, has led to a concern about the emotional reaction to them (Cambre & Cook, 1985). As a consequence of this perceived relationship between the computer and emotional reactions to it, several individuals have created the concept of computer anxiety (Cambre & Cook, 1985). Researchers providing conceptual definitions of computer anxiety generally agree that the concept fits into the category of anxiety state rather than anxiety trait (Cambre & Cook, 1985). Raub defines computer anxiety as "the complex emotional reactions that are evoked in individuals who interpret computers as personally threatening" (Cambre & Cook, 1987: p 41).

Maurer defines computer anxiety as "the fear and apprehension felt by an individual when considering the implications of utilising computer technology, or when actually using computer technology. The individual is in the state (of computer anxiety) because of fear of interaction with the computer even though the computer possesses no immediate or real threat" (Cambre & Cook, 1985: p 41).

According to Cambre & Cook (1985; p 42), Rohner and Simonson describe computer anxiety as "the mixture of fear, apprehension and hope, that people feel when planning to interact or actually interacting with a computer. Because of this feeling, people who are

computer anxious, when given the choice between using and not using a computer, often choose not to use".

Computer anxiety may be more a function of prior experiences, a modifiable condition, than a deeply entrenched attitude or personality trait (Morrow, Prell & McElroy, 1986).

Computer anxiety may occur even though the situation poses no immediate or real threat (Cambre & Cook, 1985). In this regard, according to Miller (1971) a person's attitude is the most important aspect of a successful human - computer relationship (Coovert & Goldstein, 1980). It is, therefore, important that an employer determine the attitudes of those selected to work with computers both for the benefit of the organisation and for the benefit of the workers themselves (Coovert & Goldstein, 1980).

A key factor affecting the success of an information system is the attitude of the people who use it (Hawk, 1989). The computer attitude of users impacts the degree to which they use a given computer based information system (Hawk, 1989).

Attitudes toward computers have been defined according to various types. In one particular study (Koohang, 1989), four types were defined:

- Computer anxiety, defined as anxiety toward or fear of computers or learning to use computers;

- Computer confidence, defined as confidence in the ability of one to learn about or use computers;

- Computer liking, defined as enjoyment or liking of computers;

- Perception of computer usefulness, defined as the ability to perceive computers as a useful tool after exposure to computers.

According to (Meier, 1988), computer aversion is defined as the negative affective state that occurs when individuals possess low expectations about:

- the rewards of using computers;

- their knowledge to use computers effectively, or;

- their personal competence for behaviour required to use computers effectively.

Jay (1981) calls anxiety about computers, "computerphobia" and this manifests itself in negative attitudes toward computers which have a substantial effect on a person's ability to master skills associated with computers (Levin & Gordon, 1989).

The epithets "micro-anxiety" and "computerphobia" are frequently used to describe the apprehension and uneasiness some adults exhibit relative to the technology (Lewis, 1988).

Computerphobics evidences one or more of the following (Weil, Rosen & Wugulter, 1990):

- anxiety about present or future interactions with computers or computer related technology;

- negative global attitudes about computers, their operation or their societal impact, or;

- specific negative cognitions of self-critical internal dialogues during present computer interaction or when contemplating future computer interaction.

- increased anxiety surrounding computer use as well as negative attitudes toward computers and negative cognitions or feeling about computer use (Lambert & Lenthall, 1989)

A number of different scales have been used to measure attitudes towards computers.

2.3 COMPUTER ATTITUDE SCALES

Many different computer attitude scales have been developed over the years. As part of an experimental study involving the use of computers in instruction, Raub (1981), developed an "Attitudes Toward Computers" scale designed to assess anxiety, particularly the cognitive component of the response (Cambre & Cook, 1985). This same scale was used in a further study (Morrow et al., 1986). The 25 items in the scale reflect fears and positive orientations toward personal interaction with a computer along with fears and positive outlooks regarding the impact of computers on society (Morrow et al., 1986). Raub's scale was also used to measure computer anxiety in a study of employed MBA Students (Parasuraman & Igbaria, 1990). Attitudes toward micro-computers were measured by a 20-

item scale in which individuals' were asked to indicate the extent of agreement or disagreement with series of statements about micro-computers.

A Computer Attitude Scale (CAS) was used for teachers and results indicated that this scale can be used reliably and validly to assess computer attitudes of adults who are similar to the group of teachers tested in this study (Loyd & Loyd, 1985). Sometimes, where there were no appropriate standardised scales available, a computer attitude scale was developed specifically for the study (Dambrot et al., 1985). Reliability data indicated that the scale had acceptable levels of internal consistency (Dambrot et al., 1985). Another study by Rafaeli (1986) developed a measure of employees attitudes toward working with computers. Twenty potential items for this measure were brainstormed and nine items which had significant loadings on one of positive or negative factors were included as the final items (Rafaeli, 1986).

In a study of a higher education institution in Scotland, 928 students responded to the following five items reflecting attitudes to computers and that were measured on a five point rating scale:

- the current emphasis on computers is just temporary, its a fashionable topic and there will be much less emphasis on it in a few years;

- every child should be taught about computers and how to use them;

- information technology is an essential part of most people's lives;

- word processes will never replace a good typist, and;

- I find the growing dependence of computers and information technology a little threatening (Durndell, Macleod & Siann, 1987).

Another study measured computer attitudes with the Computer Attitude Scale of Loyd and Gressard (1984), an instrument which measures attitudes toward learning about and using computers (Gressard & Loyd, 1987). The instrument provides for scores on three subscales: Computer Anxiety, Computer Confidence and Computer Liking (Gressard & Loyd, 1987). The same scale was used in a study by (Bandalos & Benson, 1990).

With the Bath County Computer Attitudes Scale (BCCAS), consisting of twenty six items, scores were found to be predictably related to computer experience and usage, educational and career plans, choice of favourite school subject and attitudes toward school subjects (Bear, Lancaster & Richards, 1987).

The Attitude Toward Computer Usage Scale (ATCUS) was developed in two studies (Popovich, Hyde, Zakrajsek & Blumer, 1987). The first study consisted of 40 items and this was reduced to 20 items in the second study by means of factor analysis (Popovich et al., 1987). Responses to the ATCUS were made on a Seven-point Likert-type scale with anchors from strongly agree (1) to strongly disagree (7) (Popovich et al., 1987). ATCUS was shown to be a reliable instrument, especially when assessing the reactions of under- graduate students to computer-related technology (Popovich et al., 1987). The purpose of another study was to compare the factor structure obtained when the ATCUS was

administered to college-age students with the factor structure which resulted when elderly individuals responded to the same items. Results of this study indicated difference in the two-factor patterns (Brown, Brown & Baack, 1988). The suggestion was that it is necessary to include adults of all ages when developing this type of measuring instrument (Brown et al., 1988).

In a study to measure managers' attitudes toward micro-computers a new instrument was developed (Howard & Smith, 1986). The final version of the attitudes toward micro-computers instrument consisted of 24 items (Howard & Smith, 1986).

For this study an Attitude Scale toward computers was developed consisting of 30 negatively and positively formulated statements about computers (Faerstein, 1986). The statements are evaluated on a seven point Likert type scale ranging from: I agree strongly (1) up to I disagree strongly (7). The score's ranged from 30 to 210 and it holds - the higher the score the more positive is the attitude. When the statements are negatively formulated the evaluation is assigned the opposite value.

Another study investigated how computer attitudes may be similar or different when compared to other office workers in the United States and Canada (Gattiker & Nelligan, 1988). Respondents completed an anonymous questionnaire to assess their attitudes toward computer based technology. A five point scale, ranging from (1) "agree completely" to (5) "disagree completely", was provided (Gattiker & Nelligan, 1988). An instrument of 27 items developed by Gattiker and Coe (1986), was used for this purpose (Gattiker & Nelligan, 1988). The four factors covered by the items were quality of job life, work effectiveness, communication and

control (Gattiker & Nelligan, 1988).

A 20-item Computer Attitude scale developed by Nickell and Pinto (1986), was used in a study by Hudiburg (1989). The scale used a five-point Likert format and was anchored with a strongly disagree value of one and a strongly agree value of five. A total of 141 undergraduate and graduate students responded to the questionnaire.

Working with a psychologist, who was an expert on phobias, a questionnaire to assess the attitudes of users toward the computer milieu was designed by Gardner, Young & Ruth (1989). After evaluating the factor analysis results a total of 35 questions were used. There were 378 managerial and other professional workers who responded to these questions (Gardner et al., 1989). The following five factors encompassed the key latent variables underlying the questions in the questionnaire: enjoyment, quality of life, fear, anxiety and service (Gardner et al., 1989).

The Collis Attitudes Toward Computers Survey consisting of 24 statements related to attitudes towards computers was used on a university student sample (Temple & Lips, 1989). The items were rated on a five-point Likert time scale from (1) "strongly disagree" to (5) "strongly agree" (Temple & Lips, 1989).

The Computer Attitude Measure (CAM), used by Kay (1989), consisted of the following sections: demographic information, cognitive attitudes, affective attitudes and behavioural attitudes.

In another study, as quoted by Kay (1989), attitudes towards computers were measured using a variation of Ajzen and Fishbein's (1980), theory of reasoned action. Both affective and cognitive

dimensions of attitudes were examined. In accordance with the theory of reasoned action, the target (the computer) and the action (using the computer) were maintained constant for all items on the attitude scale (Kay, 1989). The attitude measure was divided into two subscales, on measuring cognitive attitude (14 questions), the other measuring affective attitude (20 questions) (Kay, 1989).

Another study by Temple & Lips (1989) used the Attitude Toward Computer Scale (ATCS) consisting of 51 items. All items are rated on a five-point Likert type scale from (1) "strongly disagree" to (5) "strongly agree". 31 items measure attitudes toward computers, 15 items measure attitudes toward academic subjects other than computer science and five items measure assertiveness in school and computer situations.

Startsman & Robinson's (1972) attitudes to computers questionnaire and six additional statements were used in a study, as quoted by McConnel, O'Shea & Kirchhoff (1989), to relate attitudes toward computers of nurses and their role in health care. There were 22 statements, 16 general computer attitude statements and six statements relative to the effect of computers on nurses and their role in healthcare. 168 participants indicated their attitudes on a five-point Likert scale from (1) "strongly disagree" to (5) "strongly agree".

The Attitudes Toward Computers in General Scale (ATCIG) developed by Kjeruliff & Counte (1984), was used by Lambert & Lenthall (1989) to assess computer attitudes. The scale consists of 19 bipolar adjectives (eg good-bad, time consuming - time saving, creative - not creative) rated on a one to seven scale (Lambert & Lenthall, 1989). The scale is scored to provide an overall measure

of computer attitudes with higher scores indicating more positive attitudes (Lambert & Lenthall, 1989).

The instrument used in a study by Levin and Gordon (1989) was an attitude questionnaire designed to measure affective and cognitive attitudes toward computers. The questionnaire consisted of three parts: an affective attitude measure in the form of a semantic differential scale, and two cognitive measures, one designed to assess pupils' perceptions of the computers' functional capabilities and one measuring general attitudes toward computers and their use (Levin & Gordon, 1989).

Attitudes toward the perceived usefulness of computers was developed for a study by Koohang (1989). The instrument is a Likert-type instrument which measures attitudes toward the usefulness of computers. It consists of 12 items that are positively and negatively worded statements.

Barandi and Orlikowski's (1988) short form measure of user information satisfaction was the indicator of user attitude in another study, as quoted by Hawk (1989). This instrument measures the degree to which a user views a computer based information system as being useful (Hawk, 1989). Some researchers developed their own attitudes toward the use of personal computers scale as was the case in a study by Stone (1990). The 26 items scale was developed by following rigorous techniques, including factor analysis and a test of internal consistency. A five point Likert scale was used.

A Student Teacher Computer Survey included a cognitive component of computer attitudes consisting of fourteen questions (Kay, 1990). Odd questions were positive statements about computers and even

questions were negative statements. The affective component of attitudes was assessed using a seven-point semantic differential scale. Odd questions had a negative adjective on the left side and even questions had a positive adjective on the left side.

Two other scales are the Computer Anxiety Rating Scale (CARS) and the Computer Thoughts Survey (CTS) (Weil, Rosen & Wugulter, 1990). CARS includes 54 items that assess the level of anxieties the subjects report for various aspects of computers and computerised technology on a five-point scale from "not at all" to "very much" (Weil et al., 1990). The CTS is a 28-item survey that assesses a subject's positive and negative cognitions concerning computers (Weil et al., 1990).

Igbaria and Chakrabarti (1990) used a 10-item attitudes toward micro-computers scale. The 10 items used to construct the attitude scale were adapted from prior research (Igbaria & Parasuraman 1989; Raub 1981; Reece & Gable 1982; Swanson 1986) with the addition of some new items generated to capture issues salient to the use of micro-computers in work organisation. The items included cognitive, affective and behavioural elements measured by Likert-type response ranging from (1) strongly disagree to (5) strongly agree.

In a study using 132 first year MBA students, the computer anxiety rating scale (CARS) of Heinssen, Glass and Knight (1987) was used to measure computer anxiety (Chu & Spires, 1991). CARS is a 19-item self-report inventory, approximately equally divided between anxiety-laden statements and non anxiety statements (Chu & Spires, 1991). Subjects respond to items on a five-point scale (1 = strongly disagree - 5 = strongly agree).

An interesting study compared four attitudes toward computers scales (Woodrow, 1991). The Computer Attitude Scale developed by Gressard and Loyd (1986) was a Likert-type instrument consisting of thirty statements about attitudes toward computers and the use of computers (Woodrow, 1991). The Computer User Questionnaire consisted of twenty items as used by Griswold (1983). The ten item Attitudes Toward computers of Reece and Gable (1982) and the eleven attitude and anxiety of Steven's Computer Survey were the other scales compared in the study (Woodrow, 1991). The simultaneous administration of the four computer attitudes scales to the same group of subjects provided a unique opportunity to compare the individual validity, structure and reliability of the scales. All of the scales could reasonably be interpreted to measure a general attitude toward computers and their use. However, the scales appear to vary considerably on the basis of the attitude domains that they measure.

The most distinctive scale was the Computer User Questionnaire which sampled attitudes belonging only to the cognitive attitude domain. Attesting to the distinctive nature of this scale is the low correlation between it and the other three attitude scales. Its use as a measure of attitudes toward computers should be considered carefully because of its separation from the other three scales and also because of the distinct wording of the scale items (Woodrow, 1991).

The subscale and overall reliability co-efficients of the Computer Attitude Scale were high, indicating that each subscale was stable enough to use separately and the total score gave a reliable measure of attitudes toward computers and their use (Woodrow, 1991). Its use to measure various dimensions of attitudes toward computers is

cautioned because the analysed data strongly suggests that it is two dimensional and not three dimensional as claimed, although the total scale score appears to give an excellent, reliable attitude measure (Woodrow, 1991).

The Computer Survey scale samples a broad range of computer attitudes and correlates well with all of the other scales. However, the reliability coefficient of this scale is low, putting into question its stability (Woodrow, 1991). The Attitudes Toward Computers scale was found to be reliable, factorially stable and valid (Woodrow, 1991).

Certain findings were gained from the abovementioned studies.

2.4 FINDINGS

In a study by Howard (1986) it was found that managers with higher levels of computer anxiety had less favourable attitudes toward micro-computers. On the whole, though, managers have surprisingly uniform and positive attitudes toward their using micro-computers in management tasks. The findings of this study contradict the popular notions that managers are generally negative about the usefulness of micro-computers and that computer anxiety is an intense and widespread phenomenon. Most managers are, in fact, positive about their personally using micro-computers in support of management decision making (Howard, 1986).

People, in general, have expressed negative attitudes toward computers (Dambrot et al., 1985). There have been several reasons that have been offered to explain the widespread negative attitudes toward computers (Dambrot et al., 1985). Major reasons include

functional problems within computer systems. These problems included limited usefulness of some systems, limited availability and access to shared computer terminals, start and stop problems and interruption during work sessions due to computer downtime (Dambrot et al., 1985). There are many complaints about the inconsistency and incompatibility of computer systems and languages (Dambrot et. al, 1985).

Another problem involves inadequate training in the understanding and using of computers. Inadequate training during initial contact with computers has resulted in the subsequent use of computers being avoided (Dambrot et al., 1985). Many individuals are uncomfortable in not understanding the computer system and have a fear of breaking the computer or wiping out a data base (Dambrot et al., 1985). Most new users fail to understand that you do not need to be a programmer in order to use computers anymore than you need to be an automobile mechanic to drive a car (Dambrot et al., 1985).

Correlation analysis indicated that computer attitude was related to maths anxiety, computer aptitude and computer experience (Dambrot et al., 1985). The contribution of the moderating effect was greater for predicting negative attitudes than for predicting positive attitudes, but was significant in both cases (Dambrot et al., 1985). The effect of organisational commitment was supported only in the prediction of negative attitudes (Dambrot et al., 1985).

A study by Rafaeli (1986) supported the importance of experience in working with computers, job involvement and organisational commitment, as correlates of attitudes toward working with computers. A strong main effect of the usage of computers on both

positive and negative attitudes was evident. Job involvement and organisational commitment were both significantly related to negative attitudes about the effects of computerisation on one's work. Job involvement moderates the relationship between usage of computers and attitudes toward working with a computer.

Computer anxiety as a phenomenon may not be so widespread or severe among managers as previously thought (Howard & Smith, 1986). The fear that computer anxiety will pose a significant barrier to the penetration of technology into managerial work appears to be more myth than reality (Howard & Smith, 1986).

A study which compared attitudes of Chinese and Canadian students toward computers found that the Chinese students were overall more positive than those from Canada with regard to their opinions about the impact of computers on society (Collis & Williams, 1987). The Chinese students were, however, significantly less confident about their ability in computer studies compared to the Canadian sample (Collis & Williams, 1987).

Adults appeared to be more fearful about the use of computers than did children (Cambre & Cook, 1987). Exposure to a one week course in micro-computers had the effect of reducing instances of self-reported anxiety about the use of computers (Cambre & Cook, 1987). Results support the notion that computer anxiety is an anxiety state rather than an anxiety trait and as such can be remediated through positive computing experiences (Cambre & Cook, 1987). Students attitudes, on the whole, toward computers were in general, fairly positive (Durndell, Macleod & Siann, 1987). Another study found that the overall attitude of university students toward computers is slightly positive (Faerstein, 1986).

Computer training and education have an important positive effect upon the attitudes and computer usage behaviour of small business managers (Raymond, 1988). Computer-trained or educated managers had stronger feelings of understanding, higher levels of direct and indirect computer usage and more diversified computer applications (Raymond, 1988). Education and training appear to promote positive attitudes and use more effectively than does organisational experience with computers (Raymond, 1988).

Negative reactions to computers may partially account for the fact that the impact of machines upon work productivity in business has been negligible (Meier, 1988). Adverse reactions to micro-computer technology may also have an impact in psychology and other mental health occupations (Meier, 1988).

A study by Gamble (1988) indicated that there were some differences between the attitudes of British hospitality managers and more highly educated American professional managers. Statements offered in context about innovation with computers did reveal significant differences between the attitudes of British hospitality managers and American professionals (Gamble, 1988). Hospitality managers attribute their caution principally to lack of training (Gamble, 1988).

An initially positive or negative attitude towards a computer based information system may in part be determined by a user's internal/ external control beliefs (Hawk, 1989). Internal-control individuals believe that positive and/or negative events depend on one's own actions and therefore are under personal control. External-control individuals believe that positive and/or negative events are under control of powerful others, luck, fate etc, and are therefore beyond

personal control. The effect of user involvement on computer attitude may vary according to a user's tendency to have an initially positive attitude towards computers (Hawk, 1989). The computer attitude of external users is initially much less positive than that of internal users (Hawk, 1989). Therefore, greater opportunity exists for user involvement to result in an improved attitude towards the computer based information system when users have external-control beliefs than when they have internal-control beliefs (Hawk, 1989).

Subjects who had more computer experience expressed more positive attitudes toward computers in general (Koohang, 1989). Building a strong experiential background with computers enhances positive attitudes toward computers in general (Koohang, 1989). Subjects who have more keyboarding knowledge showed more positive attitudes toward computers in general (Koohang, 1989). Subjects who had more knowledge of computer programming, word processing and spreadsheets had a superior attitude toward computers (Koohang, 1989). Subjects who had taken a computer literacy course indicated small, but in five items, significantly more positive attitudes toward micro computers than subjects who did not have this background (Kuhn, 1989). Computer experience can facilitate significant improved computer related attitudes (Lambert & Lenthall, 1989).

It might be that positive parental attitudes toward computers are responsible for both the presence of computers in the home and the more positive attitudes of those pupils (Levin & Gordon, 1989). An important implication of Levin and Gordon's (1989) study is the need for the orientation of students toward computers prior to using them in school as well as during the course of implementation of computers (Levin & Gordon, 1989). This orientation might foster

positive attitudes toward computers in general and their functional capabilities in particular (Levin & Gordon, 1989).

Significant correlations have been found among positive, cognitive, affective and behavioural attitudes (Lewis, 1988). Findings also appear to substantiate that people are getting more accustomed to computers (Gardner et al., 1989). Feelings of awe have disappeared and positive factors now dominate (Gardner et al., 1989). Negative views are apparently held by a few who are computerphobic or anxious (Gardner et al., 1989).

The measure of computer-related stress was relatively independent of attitudes toward computers (Hudiburg, 1989). This suggests that, if a person experiences stress when dealing with computer technology, it has little to do with attitudes toward the technology (Hudiburg, 1989).

A study which sought to extend previous research by investigating in a single study the network of multivariate relationships among demographic and psychological variables, computer anxiety, and attitudes toward micro-computers among managers, confirmed the importance of individual variables in influencing computer anxiety and attitudes toward micro-computers (Igbaria & Parasuraman, 1989).

The provision of opportunities to gain experience in using computers would be beneficial in improving users' attitudes toward the system (Igbaria & Parasuraman, 1989).

The major finding in Stone's (1990) study was a significant association between managers' self-perceived leadership styles and

positive attitudes toward the use of personal computers, however, the link is weak and of limited value. The leadership styles were measured in the context of Hersey and Blanchard's situational leadership theory which suggests that an effective leader's behaviour is a function of the amount of directive and supportive behaviour a leader provides in conjunction with the dimension of follower's readiness (Stone, 1990). Those managers classified as providing much guidance and little supportive behaviour had less positive attitudes toward using personal computers than the other three styles.

Cognitive, and to a lesser extent, affective attitude are significant predictors of commitment to computers (Kay, 1990). There are also indications that men and women in managerial positions do not differ in the level of computer anxiety reported and are also very similar in their attitudes toward micro-computers (Parasuraman & Igbaria, 1990).

With respect to attitudes toward change, health professional groups felt that computer use would not affect their traditional role nor impede individual recognition and achievement (Shumway, Jacknowitz & Abate, 1990). Neither the process of learning to use a computer, nor the time which might be necessary to obtain information, negatively affected attitudes concerning the professional role of the health professionals (Shumway et al., 1990).

A study which points to the importance of early experiences in the development of computerphobics was the one by Weil et al. (1990). Although by no means conclusive, this study suggests that early role modelling of technology by people who are not themselves comfortable with technology can be predictive of later technological discomfort (Weil et al., 1990). The results showed that the first

computer experience was not the most significant computer experience in determining current feelings about technology. When an evaluation component is added, experiences tend to become negative and may establish a wariness about future computer interaction.

2.5 SUMMARY

This chapter reviewed computer attitudes, the scales/instruments used to measure these attitudes and the findings of various studies. The literature review revealed a number of different definitions of and aspects affecting computer attitudes. There have also been a number of sufferent scales/instruments developed to measure these attitudes with their respective findings. The chapter that follows will be a selective literature review of the four variables to be used in the study being undertaken, namely age, sex, locus of control and personality type.

CHAPTER 3

A SELECTIVE LITERATURE REVIEW ON THE FOUR VARIABLES UNDER STUDY

3.1 INTRODUCTION

There have been studies which have looked at various aspects of the four variables that are under review in the present study. These variables are age, sex, locus of control and personality type and this chapter selectively reviews the literature with specific reference to the role these variables play in influencing computer attitudes.

3.2 AGE

Age has been proposed as a correlate because of the belief that computer literacy is inversely related to age (Howard, 1986). Also young people are generally regarded to be more flexible attitudinally (Howard, 1986).

Age may affect an individual's attitude toward computers if the individuals who have had more experience with computers are assumed to be younger than those with less computer experience (McConnell, O'Shea & Kirchhoff, 1989). The results showed that the older the staff nurses the more they agreed that computers increased the amount of time they had available to spend with patients and that computers assisted in planning care and improved its quality. The younger nurses did not agree, which may be attributable to their lack of experience in healthcare.

The study by Massoud (1991) found no significant relationship between age and computer attitudes. This was confirmed by a study by Kuhn (1989).

However, Bandalos and Benson (1990) reported different results. In terms of age, older people may be more computer anxious than younger people because of the relative unfamiliarity of the former group with computers.

According to Cambre and Cook (1985) a study by Raub (1981) found no linear relationship between computer anxiety and age. The sample included a limited age range of seventeen to twenty-one years of age which reather limits its reliability.

These seemingly poor results with the age - computer attitude relationship gives an indication that more research is needed on the variable of age. This would especially be important if we consider that most organisations have a large age range.

3.3 SEX

There has been speculation that the sex variable may correlate with computer anxiety (Howard, 1986). The sex effect can also be suspected to be based on the negative socialisation of women toward mathematics, science and technology and on the resulting production of anxieties (Howard, 1986).

The majority of research has been carried out with students at primary and high school levels (Arch & Cummins, 1989). Unfortunately, the difference between females and males in terms of interest in computers tends to increase with age. If present trends

continue, women are likely to become seriously disadvantaged in seeking jobs in an increasingly computerised world. While young people of both sexes appreciate the importance of computers and computer skills in the modern world, males tend to use and like computers more than females. The more positive attitude of men toward computers leads to lower anxiety, higher impulsivity and less empathy as compared to women (Leiskovsky, 1988). Males use the computers available at home and school more frequently than females. Males are simply more willing than females to compete for limited resources and to take advantage of available opportunities to become computer proficient.

There is little difference between attitudes of 13 year old females and 17 year old females. Sex is a better predictor of attitude than is age (Collis, 1985). Males are constantly more positive about using computers than are females. Females and males agree that males are likely to be home-computer users in their own households (Collis, 1985). Females are more likely to associate stereotypes with computer users. The only computer attitude items to which females respond in a more positive manner than do males are those that describe the ability of women in general to be competent computer users (Collis, 1985). Females described themselves as computer anxious more often than males (Cambre & Cook, 1987).

Secondary school students were chosen as the focus of Collis' (1985) research because study and career decisions made in secondary school provide a strong direction for the students' adult lives. Sex differences in attitudes toward computers are strongly established in 13 year olds (Collis, 1985). Although females are less positive than males in their attitudes to computers, they are more positive than males on every item relating to self-confidence and pleasure in

writing stories, essays and compositions (Collis, 1985). Sex differences in the nature of this association suggested that female secondary school students are more likely than male students to associate negative attitudes and opinions to computer use and with stereotypes about computer users (Collis, 1985).

Participation in a required school computer literacy course cannot be assumed to improve females' attitudes towards or self-confidence about computer use (Collis, 1985). Extensive computer study programmes promote the most positive attitudes among the male students but the most negative attitudes among the female students (Collis, 1985). Females are more likely to associate negative attitudes towards mathematics with negative attitudes towards computers than are males (Collis, 1985).

In a study involving Chinese and Canadians, boys overall were significantly more positive than girls with respect to attitudes toward computers (Collis & Williams, 1987). Chinese girls, however, were more positive about computer studies than were same grade boys, but the differences were not significant (Collis & Williams, 1987). Canadian boys were significantly more positive about computers than were girls (Collis & Williams, 1987).

Male and female student teachers have similar cognitive and affective attitudes about computers and these attitudes are relatively positive (Kay, 1989). There were no significant differences between males and females in either cognitive or affective attitudes towards computers (Kay, 1989).

In situations where computer access is carefully structured into classroom activities, that is, where competition is not the basis for

opportunity and attitudes about potential ability are not allowed to determine use, the differences between the sexes are attenuated or disappear altogether (Arch & Cummins, 1989). Females required to participate in the use of computers, attribute competence to themselves and value to the machine. Males appear motivated to use the machines if they see them as valuable, their attitude seems to determine their willingness to participate. Males reported a more positive attitude toward computers in both structured and unstructured introductions to computers (Arch & Cummins, 1989). Females showed that their attitude toward computers was more negative than other students (Arch & Cummins, 1989).

A study by Jordan and Stroup found that sex had a strong discriminating influence on computer fearfulness (Cambre & Cook, 1985). It is suggested that to ensure equal and substantial achievement for both males and females, attention must be paid not just to making the machines attractive and accessible but taking positive action to impel women to participate in the use of this important tool (Arch & Cummins, 1989).

Males agreed that computers would save them time, be enjoyable and were superior to humans in processing information (Dambrot, Watkins-Malek, Silling, Marshall & Garver, 1985). This study found small but significant sex differences in computer attitude using a large sample of university freshmen. Females were more negative in their attitudes toward computers (Dambrot et al., 1985). For males, computer aptitude and maths anxiety were related to computer attitude. For females only maths anxiety was related to computer attitude (Dambrot et al., 1985). The lack of prerequisite background in mathematics may severely limit the involvement of woman with computers (Dambrot et al., 1985). The sex difference

in computer involvement may also be explained on the basis that women may hold more negative attitudes about computers than men. There is reason to hypothesise that women will be more negative toward computers than men because computers belong to the male domain of mathematics, electronics and machinery (Dambrot et al., 1985).

Both males and females identified computers as basically masculine objects and females responded that their male friends like computers more than their female friends (Dambrot et al., 1985). Females felt more threatened and intimidated by computers and had more fears of computers. They believed more than men that computers were complicated, made mistakes and controlled too much of our lives (Dambrot et al., 1985). Being male was a significant, but minimal, predictor of commitment to computers (Kay, 1990).

In most cases male students tend to show higher positive attitudes toward computers than female students (Koohang, 1989). Male students scored significantly higher on computer usefulness than female students did. Male students perceived computers to be more useful than female students (Koohang, 1989). Another study found that among a small, non-random population of female adults, computer anxiety existed only to a moderate degree (Kuhn, 1989). Prior computer exposure has a stronger influence on attitudes than does gender (Levin & Gordon, 1989). Sex differences were observed in perceptions of who is capable of working with computers. Girls viewed the computer as being usable by a wider range of people than did boys; boys typically held more stereotyped views (Levin & Gordon, 1989).

The male's greater computer-related competence can be explained with theories of sex-typing (Ogletree & Williams, 1990). Controlling for the effects of specific computer experience and sex-typing variables, the sex differences for the computer aptitude and self-efficacy variables were no longer significant. This study implies that investigating sex difference in attitudes toward computers without taking prior computer exposure into account distorts the picture (Levin & Gordon, 1989).

Perhaps in unstructured situations, males, because of higher expectations for success and more positive attitudes, are more likely to use computers than females, even if they have little experience with computers (Ogletree & Williams, 1990). Females, though, may need actual computer experience to help them define the computer as gender role appropriate and to have expectations of successful interactions with the computer (Ogletree & Williams, 1990). However, women in this study had more negative attitudes toward computers than men even after the effects of computer experience and masculinity/femininity, rather than biological sex per se, emerged as the more salient factors for these variables (Ogletree & Williams, 1990). Even after the effects of specific computer experience variables were removed, masculinity was a significant covariate related to more positive computer attitudes. Masculinity significantly related to more positive computer attitudes for females (Ogletree & Williams, 1990).

Another study suggests that observed gender differences are partly a function of the lower status organisational positions and roles occupied by women relative to men (Parasuraman & Igbaria, 1990).

The absence of gender differences in attitudes toward micro-computers noted in this study, indicated that women are as likely as men to utilise micro-computer technology as a decision making tool. Computer anxiety has a much stronger negative relationship with micro-computer attitudes among women than among men.

According to Popovich, Hyde, Zakrajsek & Blumer (1987) females are less positive than males in their reactions to computers. It is possible that these sex differences in reactions to computers may not be pervasive and persistent. Results of this study also showed that females are more positive than males about certain new technology items (Popovich et al., 1987). It is possible that females may wait until computers have a direct and useful influence on their lives before they will react positively to using them. Females reported less confidence and comfort with computers than did males.

Women did not report more concerns about the social impact of computers in general than did men (Temple & Lips, 1989). Women respond more positively than men when assessing the ability and potential of "women in general" as computer users and scientists but women view themselves as less comfortable, confident and competent with computers than do men (Temple & Lips), 1989).

Males reported more involvement and experience with computers in two areas: the formal study of computer science and playing computer games (Temple & Lips, 1989). No gender differences were apparent in the reporting of computer use in general of exposure to computers in academic courses other than computer science. The difference between women and men in this sample is that women, more than men, are avoiding formal pursuit of specialised training and careers in computer science.

Results of this study show that for freshmen, sex-typing of the computer was highly attenuated in this highly select subject population (Wilder, Mackie & Cooper, 1985). No longer was the computer seen as part of the male domain, females claimed it just as strongly as their own. As early as kindergarten, boys and girls view video games as more appropriate to boys than girls. Although the computer is seen more masculine than feminine item. Both sexes place computers and video games on the male side of the ledger. With students enrolled in computer courses, boys' attitudes toward computers were consistently more favourable than girls (Wilder et al., 1985). The differences between sexes in attitudes toward the computer are statistically significant, but quite small in the absolute sense (Wilder et al., 1985).

3.4 LOCUS OF CONTROL

Locus of control refers to the beliefs held by an individual regarding the cause-effect relationship between personal actions and positive and/or negative events (Hawk, 1989). Internal-control individuals believe that positive and/or negative events depend on one's own actions and therefore are under personal control. External-control individuals believe that positive and/or negative events are the control of powerful others, luck, fate etc and are therefore beyond personal control.

If a measure of internal-external locus of control is included as part of a routine employment test battery, employers would be able to predict the employees' attitudes toward having their jobs and job environments modified by a computer (Coovert & Goldstein, 1980). Even if not included as a routine part of an employment battery, employers, by using a locus of control measure, could select either

from existing employees or from a population of applicants, those workers who would be most unable to work with computers (Coovert & Goldstein, 1980). Since locus of control is a stable personality trait, it could still be used by employers to assess accurately the attitudes of employees who are aware of an impending introduction of computers (Coovert & Goldstein, 1980).

Levenson developed a new scale with three submeasures: internal - the degree to which one believes the events in one's life are under personal control; powerful-others-the extent to which a person believes that powerful others control their life events, and; chance - which measures the extent that chance is the controlling force in one's life (Coovert & Goldstein, 1980). A slightly modified version of Lee's scale of attitudes toward computers was presented in a seven-point format (Coovert & Goldstein, 1980). Rotter's (1966) 29 question measure of internal-external locus of control was also used (Coovert & Goldstein, 1980).

As was hypothesised, internal and external subjects have different attitudes toward computers, with internal subjects having a somewhat overall more positive attitude toward computers than external ones (Coovert & Goldstein, 1980). For Coovert and Goldstein's (1980) study those who viewed the computer as a tool to be utilised were considered as having a positive or favourable attitude toward computers, while those who view the computer as an autonomous or mind-controlling entity were considered as having a negative of unfavourable attitude.

The hypothesis that those with a negative attitude toward computers view it as a powerful other and therefore a potential controlling factor in their lives was not upheld (Coovert & Goldstein, 1980).

Those with negative attitudes did score higher on the powerful other and chance scales than did those with positive attitudes (Coovert & Goldstein, 1980). This further supports locus of control as a predictor of attitude toward computers (Coovert & Goldstein, 1980).

Locus of control was a highly significant correlate of attitude toward micro-computers (Howard, 1986). External locus of control managers were found to have less favourable attitudes about micro-computers (Howard, 1980).

Differences in computer attitudes of external-control and internal-control emerge if user involvement is taken into account (Hawk, 1989). With high levels of involvement, little difference exists between the computer attitude of internals and externals. When users are not highly involved, the attitude of external-control users, as indicated by their information satisfaction, is substantially less positive than of internal-control users. In another study, locus of control was a significant predictor of commitment (Kay, 1990).

People with an internal locus of control tend to cope with stressful situations better than people with external locus of control (Hawk, 1989). Since the prospect of using computers creates stress for many individually, locus of control may contribute to differences in their reaction to this situation. Individuals with internal control beliefs were more likely to view computers as beneficial tools that can help people than were external control individuals.

A study by Martin & Knight (1985), as quoted by Hawk (1989), investigated the impact of computer-based versus human-based instruction on learning. Subjects with internal-control belief performed equally well in both situations, while external-control

subjects performed better when humans administered instruction. This study did not support the general assertion that locus of control affects attitude toward information systems used at work.

In another study, as quoted by Parasuraman & Igbaria (1990), external locus of control was measured by Valencha & Ostrom's (1974) short version of Rotter's (1966) locus of control scale to assess individual's perceptions of whether they themselves or external factors influence events and outcomes in their lives. The same instrument was used in a study by (Igbaria & Parasuraman, 1989) which found that external locus of control contributes to increased computer anxiety.

Males scored significantly higher on the computer locus of control scale, indicating a more internal locus of control with respect to computers (Kay, 1989). The locus of control battery consisted of questions that focused exclusively on the use of computers (Kay, 1989). The measure consisted of 14 questions. A high score on this scale indicated a more internal locus of control with respect to computers (Kay, 1989).

The Achievement scale of the Multidimensional - Multiattributional Casuality Scale (MMCS) developed by Lefcourt, Von Bacyer, Ware and Cox (1979) was used to measure the goal specific locus of control for achievement (Woodrow, 1990). This scale assesses those aspects of locus of control most closely related to specific expectancies associated with the academic learning of university undergraduates i.e. achievement. This scale was used rather than a locus of control of causal beliefs which is a psychological attribute that has been linked with computer use. Like computer attitudes the locus of control construct is an affective learner characteristic which

is shaped through social learning experiences (Woodrow, 1990). It describes an individual's generalised expectancy about how reinforcement is controlled i.e. by internal or external means (Woodrow, 1990). Little is known about the relationship between locus of control and computer attitudes (Woodrow, 1990).

Externally-oriented individuals may be sensitive to the growing appreciation on the value of computers in educational settings and have their computer attitudes influenced accordingly (Woodrow, 1990). Conversely, internally-oriented students may be apprehensive about their ability to master computer skills and less ready to form positive computer attitudes (Woodrow, 1990).

3.5 PERSONALITY TYPE

There may also be personality differences between sexes contributing to their differential attitudes and involvement with computers (Dambrot et al., 1985). Women, in general, who achieve to gain social approval may be less motivated to achieve mastery of the complex, socially isolated, individualistic world of computers.

The measures of cognitive styles encompassing the dimensions of feeling-thinking and intuition-sensing were constructed from responses to a short form of the Myers-Briggs Type Indicator questionnaire (Parasuraman & Igbaria, 1990). The abbreviated instrument yields four scores of individuals' preferences in dealing with people and situations. Sensing and intuition reflect two modes of perception, while thinking and feeling reflect two modes o judgement. Men high on intuition-sensing experienced lower computer anxiety. Women and the feeling-thinking dimension of cognitive style are directly related to attitudes toward micro-

computers (Parasuraman & Igbaria, 1990). Women low on the feeling-thinking dimension tend to have negative attitudes toward micro-computers (Parasuraman & Igbaria, 1990).

Computerphobics shared a similar personality style with the other subjects with two possible exceptions - persistence and problem solving style (Weil, Rosen & Wugulter, 1990). In general, computerphobics are not inflexible, disorganised, impatient people who do not like to attend to details. Computerphobics do not mind taking risks and computer users are not unsociable loners. Personality style provided only limited differentiation between the groups (Weil et al., 1990). A 10 question Computerphobia Etiology Questionnaire (CEQ) composed of six sections included a section on personality style (Weil et al., 1990). The questions included a series of Likert-type ratings asking the subject to describe his/her personal style. The characteristics assessed were: adaptability, organizational style, sociability, attention to details, risktaking, persistence in problem solving, patience, help-seeking and sex-role identification both currently and in childhood.

The direct positive effect of the cognitive style of feeling-thinking on micro-computer attitudes provides partial support for the notion that systematic and analytical individuals are more likely to be comfortable with micro-computers as presently designed than intuitive or heuristic individuals (Igbaria & Parasuraman, 1989). The intuition - sensing dimension of cognitive style was unrelated to both computer anxiety and micro-computer attitudes (Igbaria & Parasuraman, 1989). The measures of cognitive styles were constructed from responses to a short form of the Myers-Briggs Type Indicator (Briggs & Myers, 1983) questionnaire, as quoted by Igbaria & Parasuraman (1989). The abbreviated instrument yields

four scores of individuals' preferences in dealing with people and situations (Igbaria & Parasuraman, 1989). Sensing and intuition reflect two modes of perception, while thinking and feeling reflect two modes of judgement (Igbaria & Parasuraman, 1989).

Intuitive and thinking individuals exhibited lower anxiety than their sensing and feeling counterparts (Chu & Spires, 1991). This has two implications. First, a computer course may be an appropriate method to reduce computer anxiety for only some cognitive styles, such as the "intuitive" class, and for some factors of anxiety (Chu & Spires, 1991). Second, if methods of reducing anxiety for individuals with high-anxiety cognitive styles, such as the "feeling" class, cannot be designed, perhaps such individuals should be counselled out of careers that involve heavy computer use (Chu & Spires, 1991). The cognitive styles of the students used, as quoted by Chu & Spires (1991), were measured using the Myers Briggs Type Indicator (MBTI) of Myers (1962, 1975), Myers & Myers (1980).

3.6 SUMMARY

This chapter reviewed the literature in respect of the four variables under study. It is apparent that there have been various results achieved in terms of these variables. The research method used in this study, to investigate the four variables in question, will be covered in the following chapter.

SECTION B:

EMPIRICAL INVESTIGATION

CHAPTER 4

METHOD OF STUDY

4.1 INTRODUCTION

As has been mentioned previously, in this day and age computers form an integral part of everyday lifestyles. An important area of this lifestyle is the work environment. It is here particularly that the ability to be able to use a computer is essential to function successfully within this environment.

The use of computers in organisations can meet with resistance. Often this resistance has to do with attitudes of people towards computers. This kind of resistance attitude towards computers gives rise to the questions of what individual variables contribute to this situation. It is important to know this because organisations have increasingly come to rely upon computer based information systems to support their day-to-day operations.

The strategy that was therefore followed was one of studying the relationship between the following four individual variables and attitudes towards the personal use of computers:

(i) age;
(ii) sex;
(iii) locus of control, and;
(iv) personality type.

4.2 STATEMENT OF HYPOTHESES

To carry out this study the following four hypotheses were formulated:

4.2.1 Older people will have less favourable attitudes toward using a computer than younger people.

4.2.2 Women will have less favourable attitudes toward using the computer than men.

4.2.3 External locus of control persons will have less favourable attitudes toward using a computer than internal than internal locus of control persons.

4.2.4 Persons with a specific personality type will have less favourable attitudes toward using a computer than other personality types.

4.3 RESEARCH METHOD

4.3.1 Sample

A random sample of 94 white collar employees of a financial institution was extracted from organisational seniority lists. All races were included in the sample population. A stratified sample was done first to divide the population into male and female strata. This was necessary to obtain sufficient men and women from the various hierarchies. A systematic sample was then taken from these two different strata.

4.3.2 Measurement instruments

4.3.2.1 Development of questionnaire

An instrument was required to obtain information regarding age, sex, locus of control and attitudes toward the personal use of computers. A comprehensive questionnaire has already been developed by Howard (1986). This instrument includes 24 questions addressed specifically to managers with respect to attitudes toward micro-computers and 18 questions of attitudes toward computers in general. For the purposes of this study, these questions were adapted to address the attitudes of all employees, not only managers, to the personal use of computers. These 42 questions were then used in the questionnaire developed for the study. The responses to the questions were measured on a five point scale from strongly agree (5) to strongly disagree (1).

The original "attitude toward micro-computers" instrument was developed by Howard (1986) following Likert's (1961) classic procedure. The steps being; development of an item pool, administration of the item pool to a group of managers, factor analysis of the results and final construction of an instrument.

A questionnaire, administered to a group of MBA students, generated an 81 item pool which represented

a fairly complete list of micro-computer concerns, compiled from the collective wisdom and experience of a group of well educated managers (Howard, 1986).

A factor analysis was then done to lend construct validity to the micro-computer attitudes instrument by discovering whether any underlying patterns to the responses could be found that would permit a reduction in the number of items in the questionnaire (Howard, 1986). The factor analysis identified six factors that each accounted for more than 5% of the total variance (Howard, 1986).

The final version of the "attitudes toward micro-computers" instrument was constructed by selecting four items from those items that loaded heavily on each of the six factors, giving a total of 24 questions (Howard, 1986). The order of these 24 items was scrambled and included as the first 24 questions of the questionnaire. Construct validity for the attitudes toward micro-computers instrument was established by the factor analysis (Howard, 1986).

Raub (1981) has developed an instrument to measure computer attitudes. Her factor analysis of the results of administering this instrument clearly identified three factors: an appreciation of computers and a desire to learn more about them, computer usage anxiety, and fears about the computer's possible negative impact on society (Howard, 1986). The 10

questions on computer anxiety and the 8 on fears about computers were used in the study by Howard (1986). Measured reliabilities for the micro-computer attitudes and computer anxiety and fears about computers instruments were excellent and construct validity of the last two factors similar to the first of the aforementioned factors (Howard, 1986).

These were the 42 questions (24 from Howard and 18 from Raub) that were adapted to be applicable to all employees, not just managers, with respect to attitudes towards the personal use of computers and which were used in the questionnaire for this study. (see Appendix A for the questionnaire).

In respect of locus of control, Rotter (1966) developed the classic instrument for measurement of locus of control. The instrument has been criticised, however, because of its length (29 items) and because the content themes of some of the items dwell on school related themes (Valecha & Ostrom, 1974). Valecha and Ostrom (1974) developed a shortened version of Rotter's (1966) instrument that corrects these problems and their instrument was used in the study by Howard (1986). The shortened instrument comprises 11 items, none of which has any school - related content (Howard, 1986). Construct validity has been carefully established and reliability is reported as .62 (N = 3,694) (Howard, 1986).

These same 11 items were used in the questionnaire

developed for the present study to measure locus of control (see Appendix A). The items consist of a forced-choice feature used by Rotter (1966) in which the respondent is required to indicate which of two statements, one internal and one external, is closest to his views. This item format is elaborated to include a judgement by the respondent as to how strongly he held the view chosen by him in the forced-choice format. The choice at this second stage is: "Is this statement very close or slightly close to your opinion?" Hence there were four different responses possible to each item (Valech & Ostrom, 1974). When a reinforcement is perceived by the subject as following some action of his own but not being entirely contingent upon his action, then, in our culture, it is typically perceived as the result of luck, chance, fate, as under the control of powerful others, or as unpredictable because of the great complexity of the forces surrounding him. This has been labelled a belief in external control (Rotter, 1966). If the person perceives that the event is contingent upon his own behaviour or his own relatively permanent characteristics, we have termed this a belief in internal control (Rotter, 1966).

The questionnaire for this study was completed by the addition of some biographical data questions. These questions covered sex, age, department, job title and qualification. The questions on sex, and age were particularly relevant to the study. The remaining questions were included as additional information

which could have been used for further comparisons.

4.3.2.2 Myers-Briggs Type Indicator

A shortened version of the Myers-Briggs Type Indicator was used to measure personality type (see Appendix B). This instrument consisted of 32 items, 21 of which were questions and 11 of which were word choices.

The Myers-Briggs Type Indicator is a forced choice, self report inventory that aims at describing an individual's preferred behaviour according to 16 types. The indicator is based on the assumption that human behaviour although seemingly random and diverse, can be categorised in an orderly and consistent manner. Whilst personality measures generally tend to identify the quantity of a trait or skill of an individual, the Myers-Briggs Type Indicator aims at sorting people into theoretical categories of type, based on given dimensions of preferred behaviour (Van Rooyen & De Beer, 1993).

The aim of the Myers-Briggs Type Indicator is to identify people's basic preferences germane to perception and judgement, and the attitudes in which these are used by different individuals, and then to establish the effects of each preference singly and in combination with other functions (Van Rooyen & De Beer, 1993).

The Myers-Briggs Type Indicator contains four separate indices (Table 4.1). Each index reflects one of four basic preferences which according to Jung's theory, direct the use of perception and judgement. The preferences affect what people prefer to attend to in any given situation and how they draw conclusions about what they perceive (Van Rooyen & De Beer, 1993).

TABLE 4.1: FOUR PREFERENCES OF THE MYERS-BRIGGS TYPE INDICATOR

INDEX	PREFERENCE BETWEEN	AFFECTS CHOICES TO
EI	E = Extravension or I = Introversion	Whether to direct perception and judgement mainly on the outer world (E) or mainly on the world of ideas (I).
SN	S = Sensing perception N = Intuitive perception	Which kind of perception is preferred when one needs or wishes to perceive.
TF	T = Thinking judgement F = Feeling judgement	Which kind of judgement to trust when one needs or wishes to make a decision.
JP	J = Judgement P = Perception	Whether to deal with the outer world in the judging (J) attitude (using T or F) or in the perceptive (P) attitude (using S or N)

According to the theory, and by definition, one pole of each of the four preferences is preferred over the other pole for each of the possible 16 Myers-Briggs Type Indicator types. Preferences are independent of each other and the four indices, giving sixteen possible combinations or "types", are indicated by the four letters of the preferences as shown in table 4.2 (Van Rooyen & De Beer, 1993).

TABLE 4.2: MYERS-BRIGGS TYPE TABLE

ISTJ	ISFJ	INFJ	INTJ
ISTP	ISFP	INFP	INTP
ESTP	ESFP	ENFP	ENTP
ESTJ	ESFJ	ENFJ	ENTJ

4.4 APPLICATION OF QUESTIONNAIRES

The two questionnaires, namely, the Computer Attitudes Questionnaire and the Myers-Briggs Type Indicator, were delivered per hand, with a covering letter explaining the purpose of and requesting assistance with the research project, to each of the 94 individuals sampled. A self-addressed envelope was enclosed to enable each individual to return the completed questionnaires to the correct place.

Each respondent thus had the option to assist or not assist, complete the questionnaires in their own time and return them by a specified date.

4.5 SCORING OF QUESTIONNAIRES

4.5.1 Computer Attitudes

Computer attitudes were scored on a five point Likert scale. Some questions (questions 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 20, 21, 22, 26, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38 and 40) were in the negative which required reverse scoring. A high total raw score indicated a

positive attitude and a low total raw score a negative attitude.

4.5.2 Locus of Control

The theoretical range of raw scores was from 11 to 44.

The scoring was done as follows:

One for an internal response - very close. (raw score 11)
Two for an internal response - slightly close. (raw scores 12 - 22)

Three for an external response - very close. (raw scores 23 - 33)

Four for an external response - slightly close. (raw scores 34 - 44)

4.5.3 Myers-Briggs Type Indicator

The Myers-Briggs Type Indicator was scored according to the standard scoring procedures for this instrument to obtain a personality type. For the purposes of this study the types were divided into four for purposes of determining relationships. The four indices used were as follows:

IS = introvert/sensing types
IN = introvert/intuitive types
ES = extravert/sensing types
EN = extravert/intuitive types

These indices were used because introversion and extraversion are the two fundamental attitudes which distinguish between individuals and are the basis of the Myers-Briggs Type Indicator. Since this study is dealing with attitudes the sensing and intuition functions were chosen because they indicate how this attitude is perceived. Using just the TJ/FJ/TP/FP indices would not have given an indication of the fundamental attitude of the respondents. The full personality type was not used because of the limited nature of this study.

4.6 STATISTICAL ANALYSIS

The Statistical Analysis System (SAS) was used to process the raw data. The following statistical tests were used;

- the product moment correlation;
- the t-test, and;
- the analysis of variance (ANOVA) technique.

The product moment correlation provides an objective measure of the direction and strength of the relationship between two variables.

The analysis of variance, like the t-test, deals with differences between sample means, but unlike the t-test, it has no restriction on the number of means. The analysis of variance also allows us to deal with two or more independent variables simultaneously, asking not only about individual effects of each variable separately but also about the interacting effects of two or more variables (Howell, 1989).

4.7 SUMMARY

The respondents in this study have been drawn from all levels of the hierarchy of a financial institution. Four hypotheses were stated and tested using statistical procedures.

The following chapter will deal with the analysis of the data.

CHAPTER 5

RESULTS

5.1 INTRODUCTION

This chapter presents the results and the analysis of the data. A description of the respondents will also be given followed by the results of the responses to the computer attitude questionnaire. Each of the four hypotheses will be tested and discussed separately.

5.2 DESCRIPTION OF RESPONDENTS

In this section, a description of the respondents is provided, including the four variables included in the hypotheses to be tested, namely age, sex, locus of control and personality type. Computer attitudes are discussed in item 5.3.

The respondents consisted of 68 white collar employees from a financial institution, representing a response rate of 72,34 percent. All races and both sexes were included in the sample population. The ages of the respondents varied from the age group 20 years and under to the age group of 56 to 60 years. All levels of the organisational hierarchy were included in the population from which the sample was taken. The qualifications of the respondents varied from some high school to post masters as shown in table 5.1.

TABLE 5.1: QUALIFICATION OF RESPONDENTS

QUALIFICATION	f	%
Some high school	1	1%
Matric	32	47%
Certificate/Diploma	10	15%
Degree	13	19%
Honours	6	9%
Masters	5	8%
Post Masters	1	1%
	68	100%

Table 5.2 shows the sex of the respondents. There was an almost even split of male and female respondents in the sample.

TABLE 5.2: SEX OF RESPONDENTS

SEX	f	%
MALE	37	54,4
FEMALE	31	45,6
	68	100

The age of the respondents varied from the age group 20 years and under to the age group 56 to 60 years. The age group from which the most respondents came was that of 26 to 30 years. Table 5.3 shows the age of the respondents.

TABLE 5.3: AGE OF RESPONDENTS

AGE	f	%
20 and under	2	2,9
21 - 25	10	14,7
26 - 30	20	29,4
31 - 35	14	20,6
36 - 40	8	11,8
41 - 45	6	8,8
46 - 50	2	2,9
51 - 55	3	4,4
56 - 60	3	4,4
	68	100

In respect of the personality type of the respondents there were the same number of internal/sensing as external/sensing types. The external/intuitive type exceded the internal/intuitive type by only three persons. The spread, therefore, between internal and external types was fairly even. The personality type of the respondents is shown in table 5.4.

TABLE 5.4: PERSONALITY TYPE OF RESPONDENTS

MYERS	f	%
1 (IS)	21	31,3
2 (IN)	11	16,4
3 (ES)	21	31,3
4 (EN)	14	20,9
Frequency Missing = 1		

The majority of the respondents had an external locus of control as shown in table 5.5.

TABLE 5.5: LOCUS OF CONTROL OF RESPONDENTS

LOCUS	f	%
1 (Very internal)	0	0,0
2 (Slightly internal)	4	7,0
3 (Very external)	46	80,7
4 (Slightly external)	7	12,3
Frequency Missing = 11		

5.3 COMPUTER ATTITUDES

5.3.1 RELIABILITY

The reliability of the computer attitudes questionnaire was tested using the Cronbach Coefficient Alpha test, which represents a measurement of internal consistency. A correlation coefficient of r = 0,93 was obtained which indicates a high level of reliability in the internal consistency of the computer attitude questionnaire.

5.3.2 RESPONSES

Table 5.6 presents the responses on the scale of 1 to 5 for each question on computer attitude and the mean and standard deviation thereof.

TABLE 5.6: RESPONSES TO QUESTIONS ON COMPUTER ATTITUDE

QUESTION		1	2	3	4	5	$\bar{X}$	SD
1	N	0	0	5	28	35	4,4	0,6
	%	*0*	*0*	*7,3*	*41,2*	*51,5*		
2	N	1	5	5	32	25	4,1	0,9
	%	*1,5*	*7,3*	*7,3*	*47,1*	*36,8*		
3	N	1	2	4	28	33	4,3	0,8
	%	*1,5*	*2,9*	*5,9*	*41,2*	*48,5*		
4	N	1	2	1	26	38	4,4	0,8
	%	*1,5*	*2,9*	*1,5*	*38,2*	*55,9*		
5	N	1	1	3	34	29	4,3	0,8
	%	*1,5*	*1,5*	*4,4*	*50,0*	*42,6*		
6	N	0	4	10	32	22	4,1	0,8
	%	*0*	*5,9*	*14,7*	*47,1*	*32,3*		
7	N	0	2	5	36	25	4,2	0,7
	%	*0*	*2,9*	*7,4*	*52,9*	*36,8*		

Table 5.6 (continued)

QUESTION		1	2	3	4	5	$\bar{X}$	SD
8	N	0	3	2	39	24	4,2	0,7
	%	*0*	*4,4*	*2,9*	*57,4*	*35,3*		
9	N	0	3	2	39	24	4,2	0,7
	%	*0*	*4,4*	*2,9*	*57,4*	*35,3*		
10	N	1	8	9	38	12	3,8	0,9
	%	*1,5*	*11,8*	*13,2*	*55,9*	*17,6*		
11	N	1	3	7	40	17	4,0	0,8
	%	*1,5*	*4,4*	*10,3*	*58,8*	*25,0*		
12	N	3	14	21	26	4	3,2	1,0
	%	*4,4*	*20,6*	*30,9*	*38,2*	*5,9*		
13	N	2	2	1	39	24	4,2	0,9
	%	*2,9*	*2,9*	*1,5*	*57,4*	*35,3*		
14	N	0	3	2	31	32	4,4	0,7
	%	*0*	*4,4*	*2,9*	*45,6*	*47,1*		
15	N	1	2	0	23	42	4,5	0,8
	%	*1,5*	*2,9*	*0*	*33,8*	*61,8*		
16	N	0	3	6	29	30	4,2	0,8
	%	*0*	*4,4*	*8,8*	*42,7*	*44,1*		
17	N	0	3	6	25	34	4,3	0,8
	%	*0*	*4,4*	*8,8*	*36,8*	*50,0*		
18	N	1	2	6	37	22	4,1	0,8
	%	*1,5*	*2,9*	*8,8*	*54,4*	*32,4*		

Table 5.6 (continued)

QUESTION		1	2	3	4	5	$\bar{X}$	SD
19	N	1	2	11	34	20	4,0	0,8
	%	*1,5*	*2,9*	*16,2*	*50,0*	*29,4*		
20	N	0	2	1	32	33	4,4	0,6
	%	*0*	*2,9*	*1,5*	*47,1*	*48,5*		
21	N	0	2	3	33	30	4,3	0,7
	%	*0*	*2,9*	*4,4*	*48,5*	*44,1*		
22	N	0	1	3	28	36	4,4	0,6
	%	*0*	*1,5*	*4,4*	*41,2*	*52,9*		
23	N	1	3	0	28	36	4,4	0,8
	%	*1,5*	*4,4*	*0*	*41,2*	*52,9*		
24	N	3	19	19	20	7	3,1	1,0
	%	*4,4*	*27,9*	*27,9*	*29,4*	*10,3*		
25	N	0	0	1	38	29	4,4	0,5
	%	*0*	*0*	*1,5*	*55,9*	*42,6*		
26	N	4	10	3	31	20	3,8	1,2
	%	*5,9*	*14,7*	*4,4*	*45,6*	*29,4*		
27	N	0	5	11	38	14	3,9	0,8
	%	*0*	*7,4*	*16,2*	*55,9*	*20,6*		
28	N	0	7	6	33	22	4,0	0,9
	%	*0*	*10,3*	*8,8*	*48,5*	*32,4*		
29	N	0	1	1	38	28	4,3	0,6
	%	*0*	*1,5*	*1,5*	*55,9*	*41,2*		

Table 5.6 (continued)

QUESTION		1	2	3	4	5	$\bar{X}$	SD
30	N	0	7	2	31	28	4,1	1,0
	%	*0*	*10,3*	*2,9*	*45,6*	*41,2*		
31	N	0	7	1	34	26	4,1	0,9
	%	*0*	*10,3*	*1,5*	*50,0*	*38,2*		
32	N	1	2	4	42	19	4,1	0,9
	%	*1,5*	*2,9*	*5,9*	*61,8*	*27,9*		
33	N	0	7	6	41	14	4,0	0,8
	%	*0*	*10,3*	*8,8*	*60,3*	*20,6*		
34	N	0	14	7	36	11	3,6	1,0
	%	*0*	*20,6*	*10,3*	*52,9*	*16,2*		
35	N	0	14	15	26	13	3,5	1,0
	%	*0*	*20,6*	*22,1*	*38,2*	*19,1*		
36	N	5	14	4	35	10	3,4	1,2
	%	*7,3*	*20,6*	*5,9*	*51,5*	*14,7*		
37	N	4	11	4	36	13	3,6	1,1
	%	*5,9*	*16,2*	*5,9*	*52,9*	*19,1*		
38	N	4	13	8	31	12	3,5	1,1
	%	*5,9*	*19,1*	*11,8*	*45,6*	*17,6*		
39	N	3	19	11	29	6	3,2	1,1
	%	*4,4*	*27,9*	*16,2*	*42,7*	*8,8*		
40	N	4	17	9	31	7	3,3	1,1
	%	*5,9*	*25,0*	*13,2*	*45,6*	*10,3*		

Table 5.6 (continued)

QUESTION		1	2	3	4	5	$\bar{X}$	SD
41	N	0	1	4	35	28	4,3	0,6
	%	*0*	*1,5*	*5,9*	*51,5*	*41,2*		
42	N	4	13	14	26	11	3,4	1,1
	%	*5,9*	*19,1*	*20,6*	*38,2*	*16,2*		

Table 5.7 gives the summary of these responses. The most favoured response on the scale of 1 to 5 is 4. This indicates that the majority of the respondents had a favourable attitude toward computers.

TABLE 5.7: SUMMARY OF RESPONSES TO QUESTIONS ON COMPUTER ATTITUDE

	1	2	3	4	5	$\bar{X}$	Sd
N	0	0	4	50	14	4,0	0,4
%	0,0	0,0	5,9	73,5	20,6		

The affect of these responses on the variables of this study, namely, age, sex, locus of control and personality type, will be analysed by testing the hypotheses against the computer attitude data obtained.

5.4 TESTING OF HYPOTHESES

5.4.1 HYPOTHESIS I

Older people will have less favourable attitudes toward using a computer than younger people.

5.4.2 CORRELATION ANALYSIS RESULTS

The Pearson product moment correlation coefficient (r) was used to test the relationship between the two variables age and attitude towards computers. The correlation coefficient represents the degree or strength of the relationship between the two variables. The results of the correlation analyses between age and each computer attitude question are presented in table 5.8.

TABLE 5.8: CORRELATION COEFFICIENTS BETWEEN AGE AND ATTITUDE

QUESTION		QUESTION		QUESTION	
1	-0,28*	**15**	-0,03	**29**	-0,03
2	-0,2	**16**	-0,12	**30**	-0,37**
3	-0,13	**17**	-0,18	**31**	-0,28*
4	-0,01	**18**	-0,12	**32**	-0,04
5	-0,22	**19**	-0,01	**33**	0,07
6	-0,29*	**20**	-0,25*	**34**	-0,18
7	-0,07	**21**	-0,15	**35**	0,13
8	-0,20	**22**	-0,03	**36**	0,16
9	-0,01	**23**	-0,06	**37**	0,11
10	-0,04	**24**	-0,43**	**38**	0,02
11	-0,02	**25**	-0,31*	**39**	-0,30*
12	-0,03	**26**	-0,08	**40**	0,13
13	-0,04	**27**	-0,11	**41**	-0,00
14	-0,11	**28**	-0,00	**42**	0,08
ALL QUESTIONS -0,16					

* $p < 0,05$ ** $p < 0,01$

5.4.3 DISCUSSION

For the hypothesis not to be rejected, a significantly strong but negative correlation coefficient is required.

The overall correlation between attitude and age is negative ($r = -0,16$), but is not significant. Hypothesis I must therefore be rejected.

If one analyses each question on attitude at $p < 0,05$ there are indications of a relationship for question numbers 6, 20, 25, 31 and 39 (see appendix A) and at $p < 0,01$ for questions 24 and 30 (see appendix A). All of them are, however, weak negative relationships.

These results indicate that older people will not necessarily have less favourable attitudes toward using a computer.

This confirms the results found by Massoud (1991) and Kuhn (1989). The fact that there are indications of differences in attitude with regard to seven of the questions (see numbers 6, 20, 24, 25, 30, 31 and 39 of Appendix A) on attitude, depending on a persons age, seems to support the results reported by Bandalos and Benson (1990) that older people may be more computer anxious than younger people because of the relative unfamiliarity of the former group with computers. It could be possible that people are becoming more and more exposed to computers, at all age levels, and therefore more experienced in their use, that age is no longer affecting attitude toward computers. This would support the results reported by McConnell et al., (1989).

5.4.4 HYPOTHESIS II

Women will have less favourable attitudes toward using the computer than men.

5.4.5 T-TEST RESULTS

One of the most common uses of the t-test involves testing the difference between the means of two independent groups. In conducting experiments with two independent variables we would most likely find that the two sample means differed by some amount. It is important, however, whether this difference is sufficiently large to justify the conclusion that the two samples were drawn from different populations. The t-test will be used to test hypothesis II. The results of this test are presented in table 5.9.

TABLE 5.9: T-TEST FOR MALE/FEMALE ATTITUDES

ITEM		MALE	FEMALE	T-VALUE
Overall attitude	$\bar{X}$	4,03	4,00	0,25
	Sd	0,42	0,49	
Q1	$\bar{X}$	4,38	4,52	-0,88
	Sd	0,59	0,68	
Q2	$\bar{X}$	4,03	4,19	-0,74
	Sd	1,01	0,83	
Q3	$\bar{X}$	4,41	4,23	0,88
	Sd	0,83	0,84	
Q4	$\bar{X}$	4,54	4,32	1,06
	Sd	0,51	1,05	

Table 5.9 (continued)

ITEM		MALE	FEMALE	T-VALUE
Q5	$\bar{X}$	4,38	4,23	0,79
	Sd	0,59	0,92	
Q6	$\bar{X}$	3,97	4,16	-0,93
	Sd	0,93	0,73	
Q7	$\bar{X}$	4,24	4,23	0,10
	Sd	0,68	0,76	
Q8	$\bar{X}$	4,22	4,26	-0,24
	Sd	0,67	0,77	
Q9	$\bar{X}$	4,30	4,16	0,77
	Sd	0,66	0,78	
Q10	$\bar{X}$	3,76	3,77	-0,08
	Sd	0,89	0,99	
Q11	$\bar{X}$	4,11	3,90	0,99
	Sd	0,66	0,98	
Q12	$\bar{X}$	3,35	3,03	1,33
	Sd	0,95	1,02	
Q13	$\bar{X}$	4,08	4,32	-1,17
	Sd	0,86	0,83	
Q14	$\bar{X}$	4,41	4,29	0,60
	Sd	0,55	0,94	
Q15	$\bar{X}$	4,65	4,35	1,47
	Sd	0,48	1,02	
Q16	$\bar{X}$	4,22	4,32	-0,53
	Sd	0,75	0,87	
Q17	$\bar{X}$	4,41	4,23	0,87
	Sd	0,64	0,99	

Table 5.9 (continued)

ITEM		MALE	FEMALE	T-VALUE
Q18	$\bar{X}$	4,08	4,19	-0,55
	Sd	0,68	0,95	
Q19	$\bar{X}$	4,11	3,94	0,83
	Sd	0,81	0,89	
Q20	$\bar{X}$	4,38	4,45	-0,44
	Sd	0,64	0,72	
Q21	$\bar{X}$	4,35	4,32	0,17
	Sd	0,68	0,75	
Q22	$\bar{X}$	4,46	4,45	0,05
	Sd	0,61	0,72	
Q23	$\bar{X}$	4,46	4,32	0,66
	Sd	0,77	0,91	
Q24	$\bar{X}$	2,81	3,52	-2,81**
	Sd	1,00	1,06	
Q25	$\bar{X}$	4,35	4,48	-1,04
	Sd	0,54	0,51	
Q26	$\bar{X}$	3,86	3,68	0,63
	Sd	1,11	1,30	
Q27	$\bar{X}$	3,73	4,10	-1,88
	Sd	0,77	0,83	
Q28	$\bar{X}$	4,00	4,06	-0,28
	Sd	0,85	1,00	
Q29	$\bar{X}$	4,38	4,35	0,16
	Sd	0,49	0,71	
Q30	$\bar{X}$	4,00	4,39	-1,82
	Sd	1,03	0,72	

Table 5.9 (continued)

ITEM		MALE	FEMALE	T-VALUE
Q31	$\bar{X}$	4,11	4,23	-0,54
	Sd	0,88	0,92	
Q32	$\bar{X}$	4,19	4,03	0,81
	Sd	0,67	0,91	
Q33	$\bar{X}$	3,97	3,84	0,65
	Sd	0,83	0,86	
Q34	$\bar{X}$	3,54	3,77	-0,99
	Sd	1,07	0,88	
Q35	$\bar{X}$	3,65	3,45	0,78
	Sd	0,98	1,09	
Q36	$\bar{X}$	3,65	3,23	1,44
	Sd	1,06	1,31	
Q37	$\bar{X}$	3,78	3,45	1,16
	Sd	0,92	1,36	
Q38	$\bar{X}$	3,57	3,42	0,52
	Sd	1,14	1,20	
Q39	$\bar{X}$	3,11	3,39	-1,04
	Sd	1,05	1,15	
Q40	$\bar{X}$	3,46	3,10	1,31
	Sd	1,07	1,19	
Q41	$\bar{X}$	4,35	4,29	0,38
	Sd	0,63	0,69	
Q42	$\bar{X}$	3,57	3,19	1,31
	Sd	0,99	1,30	

** $p < 0,01$

5.4.6 DISCUSSION

Except for one question (Question 24), there is no indication of a significant difference in attitude toward using a computer between male and female. The hypothesis can thus be rejected.

The only question which gives an indication of a difference in attitude between male and female is question 24. The question stated: "If I get a personal computer, then everyone else in the organisation will want one". This was at $p < 0,01$ and with a t-value of -2,81. The women in this sample, however, have a more favourable attitude towards this question.

These results do not support those reported by Collis (1985), that males are constantly more positive about using computers than are females. The results of this study also do not support the results reported by Arch and Cummins (1989). Similar results were, however, reported by Kay (1989) that there were no significant differences between males and females in their attitudes towards computers.

Ogletree and Williams (1990) and Parasuraman and Igbaria (1990) reported that experience in the use of computers influences a persons attitude towards computer and that this should be taken into account when gender differences in attitudes toward computers are being considered. The population sample used in the present study have been exposed to computers and so this may have influenced the result that there is no difference in the attitudes of males and females toward the personal use of computers.

5.4.7 HYPOTHESIS III

External locus of control persons will have less favourable attitudes toward using a computer than internal locus of control persons.

5.4.8 TESTS

The t-test was also used to test the above hypothesis. The results of this test are presented in table 5.10.

TABLE 5.10: T-TEST FOR LOCUS OF CONTROL

ITEM		INTERNAL	EXTERNAL	T-VALUE
Overall Attitude	$\bar{X}$	4,07	4,04	0,26
	Sd	0,22	0,43	
Q1	$\bar{X}$	4,75	4,41	1,27
	Sd	0,50	0,63	
Q2	$\bar{X}$	4,50	4,09	1,29
	Sd	0,58	0,90	
Q3	$\bar{X}$	4,00	4,38	-0,53
	Sd	1,41	0,77	
Q4	$\bar{X}$	4,75	4,53	0,84
	Sd	0,50	0,64	
Q5	$\bar{X}$	4,75	4,36	1,49
	Sd	0,50	0,59	
Q6	$\bar{X}$	4,50	4,13	1,19
	Sd	0,58	0,79	
Q7	$\bar{X}$	3,75	4,19	-1,63
	Sd	0,50	0,74	

Table 5.10 (continued)

ITEM		INTERNAL	EXTERNAL	T-VALUE
Q8	$\bar{X}$	4,25	4,26	-0,05
	Sd	0,05	0,65	
Q9	$\bar{X}$	4,50	4,21	0,96
	Sd	0,58	0,69	
Q10	$\bar{X}$	3,75	3,77	-0,08
	Sd	0,50	0,95	
Q11	$\bar{X}$	4,25	4,02	0,84
	Sd	0,50	0,82	
Q12	$\bar{X}$	4,26	3,13	2,25
	Sd	0,95	0,94	
Q13	$\bar{X}$	4,50	4,16	1,06
	Sd	0,58	0,87	
Q14	$\bar{X}$	4,75	4,36	1,46
	Sd	0,50	0,71	
Q15	$\bar{X}$	4,75	4,53	0,82
	Sd	0,50	0,77	
Q16	$\bar{X}$	4,75	4,25	1,85
	Sd	0,50	0,78	
Q17	$\bar{X}$	4,75	4,32	1,57
	Sd	0,50	0,80	
Q18	$\bar{X}$	3,25	4,21	-1,27
	Sd	1,50	0,69	
Q19	$\bar{X}$	4,50	3,92	1,84
	Sd	0,58	0,87	
Q20	$\bar{X}$	4,50	4,45	0,16
	Sd	0,58	0,64	

Table 5.10 (continued)

ITEM		INTERNAL	EXTERNAL	T-VALUE
Q21	$\bar{X}$	4,50	4,36	0,47
	Sd	0,58	0,68	
Q22	$\bar{X}$	4,75	4,51	0,92
	Sd	0,50	0,58	
Q23	$\bar{X}$	4,25	4,38	-0,17
	Sd	1,50	0,84	
Q24	$\bar{X}$	3,75	3,13	0,96
	Sd	1,26	1,07	
Q25	$\bar{X}$	4,50	4,42	0,29
	Sd	0,58	0,53	
Q26	$\bar{X}$	4,00	3,81	1,09
	Sd	0,00	1,26	
Q27	$\bar{X}$	3,50	3,96	-0,90
	Sd	1,00	0,78	
Q28	$\bar{X}$	3,00	4,11	-1,89
	Sd	1,15	0,84	
Q29	$\bar{X}$	4,00	4,45	-6,11**
	Sd	0,00	5,39	
Q30	$\bar{X}$	4,00	4,21	-0,29
	Sd	1,41	0,91	
Q31	$\bar{X}$	4,00	4,17	-1,32
	Sd	0,00	9,35	
Q32	$\bar{X}$	4,00	4,19	-1,94
	Sd	0,00	7,09	
Q33	$\bar{X}$	4,00	3,91	0,76
	Sd	0,00	9,04	

Table 5.10 (continued)

ITEM		INTERNAL	EXTERNAL	T-VALUE
Q34	$\bar{X}$	3,50	3,58	-0,16
	Sd	1,00	1,03	
Q35	$\bar{X}$	3,25	3,57	-0,63
	Sd	0,96	1,07	
Q36	$\bar{X}$	3,25	3,54	-0,59
	Sd	0,96	1,19	
Q37	$\bar{X}$	3,25	3,77	-1,04
	Sd	0,96	1,10	
Q38	$\bar{X}$	3,75	3,62	0,20
	Sd	1,26	1,11	
Q39	$\bar{X}$	3,00	3,15	-0,21
	Sd	1,41	1,13	
Q40	$\bar{X}$	3,25	3,36	-0,22
	Sd	0,96	1,16	
Q41	$\bar{X}$	4,25	4,36	-0,41
	Sd	0,50	0,62	
Q42	$\bar{X}$	3,50	3,36	0,16
	Sd	1,73	1,13	

** $p < 0,01$

A further test, the analysis of variance (ANOVA), was also used to test hypothesis III. The analysis of variance is a statistical technique for testing for differences in the means of several groups. It has no restriction on the numbers of means being used and the analysis of variance can also deal with two or more independent variables simultaneously.

In this case three independent variables or groups were used in the ANOVA, namely slightly internal locus of control, very external locus of control and slightly external locus of control. The results of this analysis are presented in table 5.11 (see Appendix C for summary table).

TABLE 5.11: ANALYSIS OF VARIANCE FOR LOCUS OF CONTROL

ITEM	F-VALUE
Overall Attitude	0,06
Q1	0,52
Q2	0,39
Q3	0,62
Q4	0,32
Q5	1,37
Q6	0,41
Q7	3,97*
Q8	0,01
Q9	0,71
Q10	0,19
Q11	0,15
Q12	2,69
Q13	0,27
Q14	0,95
Q15	0,39
Q16	1,02
Q17	0,61

Table 5.11 (continued)

ITEM	F-VALUE
Q18	2,96
Q19	0,84
Q20	0,99
Q21	0,49
Q22	0,40
Q23	0,05
Q24	0,90
Q25	0,28
Q26	0,05
Q27	1,62
Q28	4,29*
Q29	1,79
Q30	0,31
Q31	0,54
Q32	0,44
Q33	0,03
Q34	0,35
Q35	0,16
Q36	0,32
Q37	0,59
Q38	0,05
Q39	0,29
Q40	0,15
Q41	0,55
Q42	0,16

* $p < 0,05$

5.4.9 DISCUSSION

Using the t-test, there is no indication of a significant difference in the overall attitude toward using a computer between internal and external locus of control persons. It must, however, be borne in mind that of the 57 persons for whom a locus of control was obtained, 53 were external of nature.

There was, however, an indication of a difference in attitude toward question 29. The question stated: "If given the opportunity to use a computer, I'm afraid I might damage it in some way".In this question, external locus of control people were more positve than internal locus of control people.

Hypothesis III is thus also rejected: there is not sufficient evidence to suggest that external locus of control people have less favourable computer attitudes than internal locus of control people.

An analysis of variance was also done to test this hypothesis, using three groups and not two as previously. At $p < 0,05$ and an F-value of 0,06 there is no indication of the hypothesis being held true.

However, questions 7 and 28 reported significant F-values and thus for these two questions there appears to be a difference in attitude between the three groups. Question 7 stated: "A personal computer could provide me with information in a form exactly tailored to my needs".

Question 28 stated: "I feel apprehensive about using a computer terminal". It appears that external locus of control persons have less favourable attitudes toward these two questions. Once again it must be borne in mind that only 4 out of 57 respondents were internal locus orientated.

According to Coovert and Goldstein's (1980) study, internal locus of control subjects have a somewhat overall more positive attitude toward computers than external ones. Howard (1986) also reported that external locus of control managers have less favourable attitudes about computers. The results of the present study do not confirm this.

A later study by Hawk (1989) reported that with high levels of computer involvement, little difference exists between the computer attitude of internal and external locus of control persons. Although Kay's (1990) study reported that locus of control was a significant predictor of commitment, a study by Woodrow (1990) reported that little is known about the relationship between locus of control and computer attitudes. This results is supported by the results of the present study.

It appears that the latest studies are showing that there is no significant difference between internal and external locus of control person's attitude toward computers. This may be due to the fact that all persons are getting more and more exposure to computers these days and all are becoming more and more comfortable with them.

5.4.10 HYPOTHESIS IV

Persons with a specific personality type will have less favourable attitudes toward using a computer than other personality types.

5.4.11 ANALYSIS OF VARIANCE

An analysis of variance was done to test hypothesis IV. The results of this analysis are presented in table 5.12 (see also Appendix C for summary table).

TABLE 5.12: ANALYSIS OF VARIANCE FOR PERSONALITY TYPE

ITEM	F-VALUE
Overall attitude	0,55
Q1	1,02
Q2	0,27
Q3	0,43
Q4	0,49
Q5	1,06
Q6	0,04
Q7	0,42
Q8	0,48
Q9	0,78
Q10	0,82
Q11	0,31
Q12	1,43

Table 5.12 (Continued)

ITEM	F-VALUE
Q13	0,35
Q14	0,85
Q15	1,02
Q16	2,53
Q17	0,86
Q18	0,99
Q19	0,71
Q20	0,95
Q21	0,43
Q22	0,46
Q23	0,13
Q24	1,14
Q25	0,28
Q26	0,22
Q27	0,48
Q28	1,15
Q29	0,02
Q30	0,07
Q31	0,35
Q32	0,22
Q33	0,76
Q34	1,69
Q35	0,21
Q36	1,10
Q37	2,34
Q38	1,04

Table 5.12 (Continued)

ITEM	F-VALUE
Q39	0,96
Q40	2,34
Q41	0,68
Q42	1,30

5.4.12 DISCUSSION

As is evident from Table 5.12 there is no indication of any significant difference in the attitudes toward computers of different personality types. This also applied with respect to each individual question. Hypothesis IV can also be held not true.

The results of the present study are in line with those of previous studies. A study by Weil et al., (1990), reported that personality style provided only limited differention in attitude between groups. Another study by Igbaria and Parasuraman (1989) reported that there was only partial support for personality style affecting a persons attitude toward computers. Another study by Chu and Spies (1991) reported that intuitive and thinking individuals exhibited lower anxiety than their sensing and feeling counterparts. It was not clear, however, if this anxiety affected the individual's attitude toward computers.

It appears that personality type has little affect on an individual's attitude toward computers as confirmed by the present study.

5.5 SUMMARY

This chapter presented the results obtained from the various statistical tests that were carried out. These results were also analysed and discussed in relation to previous studies. In the next and final chapter, conclusions and recommendations that can be made will be made.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

In current times, the importance of computers in our society is well-known. It is thus important to have a good attitude towards the personal use of computers. This is an important theme of this study in order that computers can be used to their full potential and productively. However, it is also important to realise that there may be resistance toward the use of computers. It was with this in mind that this study aimed at measuring the attitudes of people toward the personal use of computers and determining the relationship between these attitudes and individual variables of age, sex, locus of control and personality type. The logic behind this was that knowledge of what affects peoples' attitudes toward the personal use of computers would suggest what needs to be attended to overcome this resistance using computers.

This study found that attitudes toward the personal use of computers was in general positive and not related to by the individual variables of age, sex, locus of control and personality type. The fact that the sample of people was randomly selected and contained respondents who possessed a diversity of educational and experiential backgrounds lends generalizability to the results. As far as making any conclusions it is necessary to look at each of the individual variables separately.

6.2 CONCLUSIONS

In general, from this study, it can be concluded that peoples attitude toward the personal use of computers is positive and not affected by the individual variables tested in this study. Each of these variables are discussed below.

6.2.1 Age

From this study it can be concluded that age has little affect on people's attitude toward computers. People seem to, these days, have more exposure to computers at all ages and seem to show less resistance to them.

With regard to this study the sample was taken from an organisation that makes a major use of computers in its daily operations and so this exposure and, perhaps, experience in the use of computers may have affected the results attained.

6.2.2 Sex

The sex of a person was found not to be related to their attitude toward computers. This was with a population sample which was almost evenly split between male (37) and female (31).

It could be concluded that women are now getting as much exposure to and experience in computers that their attitude is just as positive toward computer use as is that of their male colleagues.

6.2.3 Locus of control

This study found that there was no difference between the internal and external locus of control persons attitude toward the use of computers. This may, however, not be conclusive because of the 57 respondents to the locus of control questionnaire 53 were external locus of control. There was therefore too few internal locus of control persons to really draw any conclusions from these results.

It could, however, be said that external locus of control persons seem to have a positive attitude toward computers. It should also be borne in mind that when computers are being installed at work stations that this study is not conclusive in predicting that there will be little or no resistance to computers because of the locus of control variable.

6.2.4 Personality Type

This study seems to indicate that personality type is also not related to attitudes towards the use of computers. This may not be conclusive since the majority of those people involved in the sample have had some computer exposure.

On the other hand, there were an equal number of internal-sensing (21) and external-sensing (21) and an almost equal number of internal-intuition (11) and external-intuition (14) types in the sample, which lends some strength to the generalizability of the results attained.

6.3 LIMITATIONS OF STUDY

There have be some limitations with respect to this study.

The sample population was taken from only one organisation and so this gives limited results. Another limitation is the fact that the majority of this organisation has had exposure to computers. This may have influenced the results.

The fact that the majority of the respondents had an external locus of control, placed a limitation on the correlation between internal locus of control, external locus of control and computer attitudes.

Regarding personality type, full personality types were not used. This is another limitation of the study.

6.4 RECOMMENDATIONS

6.4.1 Further studies should include in the sample population people from different organisations and not just from a single organisation. This would bring more differentiation into the sample and make the results more conclusive.

6.4.2 Although one can obviously not predict the responses one will get from a random sample, further studies need to try and get a better spread of internal and external locus of control persons into the sample to improve the conclusiveness of the results.

6.4.3 Further studies should take cognisance of prior exposure to and experience in the use of computers as a variable of the

study. This would make the results more conclusive if similar results to this study are attained.

6.4.4 In respect of the variable, personality type, more research needs to be done to include all 16 personality types and not just those used for this limited study. This would provide more information on attitude toward computers in relationship to personality type.

6.4.5 It is also recommended that further studies address attitude toward the use of computers in relation to the training received in the use of computers. This could be an important predictor of future attitude toward the use of computers.

6.5 FINALE

In terms of the whole study and taking the limitations into account, there is enough value in the results to indicate that in general people are exhibiting more and more positive attitudes towards computers as they become more and more exposed to them and experienced in their use. This holds true irrespective of the personal variables under study.

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APPENDIX A

COMPUTER ATTITUDES QUESTIONNAIRE

Please answer the following questions by circling the number in the appropriate answer box.

(Office use)		
☐	☐	☐
1	2	3

The first group of questions pertains specifically to personal computers. The questions probe your attitudes about you personally using a personal computer as an aid in your various tasks. In answering, please assume that the personal computer is sitting on your desk and is not attached to any equipment other than its own printer and monitor. Work quickly and choose the answers that best describe your feeling about or reaction to each statement.

Legend:

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
SA	**A**	**U**	**D**	**SD**

		SA	A	U	D	SD	For Office Use
1.	A personal computer would give me more timely access to needed information	5	4	3	2	1	4
2.	I wouldn't use a personal computer because programming it would take too much time	5	4	3	2	1	5
3.	A personal computer would be of no use to me because of its small storage capacity	5	4	3	2	1	6
4.	I wouldn't use a personal computer because this would be clerical in nature	5	4	3	2	1	7

		SA	A	U	D	SD	For Office Use
5.	Using a personal computer would take too much time from my normal duties	5	4	3	2	1	8
6.	I would hesitate to acquire a personal computer for my use at work because of the difficulty of intergrating it with existing information systems	5	4	3	2	1	9
7.	A personal computer could provide me with information in a form exactly tailored to my needs	5	4	3	2	1	10
8.	I wouldn't use a personal computer because inputting data would take too much time	5	4	3	2	1	11
9.	A personal computer would be of no use to me because of its limited computing power	5	4	3	2	1	12
10.	Using a personal computer would result in tendency to overdesign simple tasks	5	4	3	2	1	13
11.	Using a personal computer would involve too much time doing mechanical operations (programming, inputting data, etc) to allow sufficient time for data analysis	5	4	3	2	1	14
12.	A potential problem with personal computer use at work is the proliferation of incompatible programs within an organisation	5	4	3	2	1	15
13.	Using a personal computer, I could create my own personal database of important information	5	4	3	2	1	16
14.	I wouldn't use a personal computer because it is too time consuming	5	4	3	2	1	17

		SA	A	U	D	SD	For Office Use
15.	Personal computers are primarily just toys, such as video games, so they can't be of much real use at work	5	4	3	2	1	18
16.	I wouldn't want a personal computer because I would not be able to delegate the routine data look-up tasks which I now delegate	5	4	3	2	1	19
17.	I wouldn't encourage my company to acquire personal computers because of the high purchase cost of the machine and its software.	5	4	3	2	1	20
18.	I would discourage my company from acquiring personal computers because most application packages would need to be modified before they would be useful in our specific situation	5	4	3	2	1	21
19.	Using a microcomputer could provide me with information that would lead to better decisions	5	4	3	2	1	22
20.	I wouldn't want a personal computer because it would take too long to learn to use	5	4	3	2	1	23
21.	Personal computers have far too little computing capability to be useful to anyone in real life business situations	5	4	3	2	1	24
22.	If I personally used a personal computer at work, it would damage the image that I would want to project	5	4	3	2	1	25
23.	I would encourage anyone to learn about and use personal computers at work	5	4	3	2	1	26
24.	If I get a personal computer, then everyone else in the organisation will want one	5	4	3	2	1	27

		SA	A	U	D	SD	For Office Use
25.	I am confident that I could learn computer skills	5	4	3	2	1	28
26.	I am unsure of my ability to learn a computer programming language	5	4	3	2	1	29
27.	I will be able to keep up with the important technological advances of computers	5	4	3	2	1	30
28.	I feel apprehensive about using a computer terminal	5	4	3	2	1	31
29.	If given the opportunity to use a computer, I'm afraid I might damage it in some way	5	4	3	2	1	32
30.	I have avoided computers because they are unfamiliar to me	5	4	3	2	1	33
31.	I hesitate to use a computer for fear of making mistakes that I cannot correct	5	4	3	2	1	34
32.	I am unsure of my ability to interpret a computer printout	5	4	3	2	1	35
33.	I have difficulty understanding most technological matters	5	4	3	2	1	36
34.	Computer terminology sounds like confusing jargon to me	5	4	3	2	1	37
35.	Human beings will misuse the power of the computer	5	4	3	2	1	38
36.	Computers are changing the world too rapidly	5	4	3	2	1	39
37.	Our country relies too much on computers	5	4	3	2	1	40
38.	Computers dehumanise society by treating everyone as a number	5	4	3	2	1	41
39.	In the future, power will be concentrated in the hands of the technological elite	5	4	3	2	1	42

		SA	A	U	D	SD	For Office Use
40.	Computers have the potential to control our lives	5	4	3	2	1	43
41.	Computers are beneficial aids to modern society	5	4	3	2	1	44
42.	Computers will create more jobs than they will eliminate	5	4	3	2	1	45

The next group of questions explores the way in which certain important events in our society affect different people. Each item consists of a pair of statements and next to each statement are the words "very close" and "slightly close".

The following steps apply when completing this section:

Step 1: Decide which of the two statements you personally believe to be the case. Ignore the statement not chosen.

Step 2: Circle "very close" if the statement is very close to your personal feeling or "slightly close" if the statement is only slightly close to your personal feeling.

Step 3: Be sure that you have circled only one of the four choices associated with each question.

Be sure to respond based on what you actually believe rather than on how you think you should respond or on what you would like to be true.

This is a measure of personal belief: obviously there are no right or wrong answers.

Please answer the items carefully but do not spend too much time on any one item. In some instances you may discover that you believe both statements or neither one. In such case be sure to select the one choice you strongly believe to be true as far as you are concerned. Also, try to respond independently when making your choice; do not be influenced by your previous choices. The first item is already marked as an example.

				For Office Use
xx	Very Close 1	Slightly Close 2	One of the major reasons why we have wars is because people don't take enough interest in politics	
	Very Close 3	Slightly Close 4	There will always be wars, no matter how hard people try to prevent them	
43.	Very Close 1	Slightly Close 2	Many of the unhappy things in people's lives are partly due to bad luck	
	Very Close 3	Slightly Close 4	People's misfortunes result from the mistakes they make	46
44.	Very Close 1	Slightly Close 2	In the long run, people get the respect they deserve in this world	
	Very Close 3	Slightly Close 4	Unfortunately, an individual's worth often passes unrecognised no matter how hard he tries	47
45.	Very Close 1	Slightly Close 2	Without the right breaks, one cannot be an effective leader	
	Very Close 3	Slightly Close 4	Capable people who fail to become leaders have not taken advantage of their opportunities	48
46.	Very Close 1	Slightly Close 2	Becoming a success is a matter of hard work; luck has little or nothing to do with it	
	Very Close 3	Slightly Close 4	Getting a good job depends mainly on being in the right place at the right time	49
47.	Very Close 1	Slightly Close 2	What happens to me is my own doing	
	Very Close 3	Slightly Close 4	Sometimes I feel that I don't have enough control over the direction my life is taking	50

				For Office Use
48.	Very Close 1	Slightly Close 2	When I make plans, I am almost certain that I can make them work	
	Very Close 3	Slightly Close 4	It is not always wise to plan too far ahead, because many things turn out to be a matter of good or bad fortune anyway	51
49.	Very Close 1	Slightly Close 2	In my case, getting what I want has little or nothing to do with luck	
	Very Close 3	Slightly Close 4	Many times we might just as well decide what to do by flipping a coin	52
50.	Very Close 1	Slightly Close 2	Who gets to the boss often depends on who was lucky to be in the right place first	
	Very Close 3	Slightly Close 4	Getting people to do the right thing depends upon ability; luck has little or nothing to do with it	53
51.	Very Close 1	Slightly Close 2	Most people don't realise the extent to which their lives are controlled by accidental happenings	
	Very Close 3	Slightly Close 4	There is really no such thing as "luck"	54
52.	Very Close 1	Slightly Close 2	In the long run, the bad things that happen to us are balanced by the good ones	
	Very Close 3	Slightly Close 4	Most misfortunes are the result of the lack of ability, ignorance, laziness, or all three	55
53.	Very Close 1	Slightly Close 2	Many times I feel that I have little influence over the things that happen to me	
	Very Close 3	Slightly Close 4	It is impossible for me to believe that luck or chance plays an important role in my life	56

These last few questions are needed so that I can develop a profile of those who responded to the questionnaire.

54. Circle your sex

Male	Female
1	2

57

55. Circle your age group number

1	20 and under
2	21 - 25
3	26 - 30
4	31 - 35
5	36 - 40
6	41 - 45
7	46 - 50
8	51 - 55
9	56 - 60
10	Over 60

58

56. What department do you work in?

_____

57. What is your current job title?

_____

58. Circle your highest qualification.

1	2	3	4	5	6	7	
Some high school	Matric	Certificate/ Diploma	Degree	Honours	Masters	Post Masters	59

THANK YOU FOR YOUR TIME AND CO-OPERATION

APPENDIX B

MYERS-BRIGGSTOETS
MYERS-BRIGGS TEST

Deel 1: Omsirkel die antwoord wat mees verteenwoordigend is van hoe u gewoonlik voel of optree

Part 1: Encircle the most appropriate answer indicating your natural feelings or reactions

1.	Is u meer bedag omtrent: A. mense se gevoelens; B. hulle regte?	Are you mindful of: A. the feelings of people; B. their rights?
2.	Wanneer u vreemdelinge moet ontmoet, ondervind u dat dit: A. iets is wat heelwat moeite verg; (sien u daarteen op?); B. aangenaam, of ten minste maklik is?	When meeting strangers, do you find it to be: A. a demanding experience (shrink away from it); B. delightful or easy?
3.	Om by 'n skedule te hou: A: staan my aan; B: beperk my?	To stick to a schedule is: A: acceptable or preferable; B: restricts or limits me?
4.	Kan u gewoonlik beter oor die weg kom met: A. mense wat verbeeldingryk is; B. mense wat realisties is?	I associate better with: A. imaginative people; B. people that are realistic?
5.	Is u in wese: A. taamlik stil en terughoudend in geselskap; B. 'n mens wat maklik kan "meng"?	Are you: A. naturally quiet and reserved in conversation; B. a person that mingles easily?
6.	Is dit vir u moeiliker om aan te pas by: A. roetine; B. konstante verandering?	Which demands more from you: A. routine; B. constant change?

7.	Watter een van die twee beskou u as die grootste kompliment: A. hy is 'n werklike gevoelsmens; B. hy is deurgaans redelik?	Which one of the two complements more: A. he is a man of feeling; B. he is throughout a reasonable person?
8.	Sou u uself beoordeel as iemand wat: A. meer entoesiasties is as die gemiddelde persoon; B. minder opgewonde kan raak as die gemiddelde persoon?	Would you describe yourself as: A. more enthusiastic than the average person; B. a person getting less excited that the average?
9.	Wanneer u met 'n hele aantal ander persone iets onderneem hou u meer daarvan: A. om dit op die aanvaarde manier te doen; B. om 'n wyse van u eie te bedink?	When you attempt something where other people are involved, do you prefer: A. to act according to the accepted way; B. think of your own way to do it?
10.	Is u op u beste (kom u die meeste tot u reg): A. wanneer u 'n sorgvuldige uitgewerkte plan (moet) volg; B. wanneer u die onverwagte moet hanteer?	I am at my best when: A. I operate according to a detailed plan; B. I must cope with the unexpected?
11.	Raak u meer ontstig (vererg) oor: A. denkbeeldige ("fancy") teorieë; B. mense wat nie van teorieë hou nie?	Which annoys you most: A. imaginary or fancy theories; B. people that don't like theories?
12.	Wat is meer prysenswaardig - om iemand te noem: A. 'n persoon van visie ("vision"); B. 'n persoon van gesonde verstand ("common sense")?	Which is more praiseworthy to call a person: A. a person with vision; B. a person with common sense?
13.	Laat u meer dikwels toe dat: A. u hart u verstand lei; B. u verstand u hart lei?	Do you more regularly allow: A. your heart to be led by your common sense; B. your common sense to be led by your heart?

14.	Wanneer u dink aan 'n klein dingetjie wat u behoort te doen, of te koop, is u geneig om dit: A. dikwels te vergeet tot heelwat later; B. gewoonlik te notuleer voordat dit u ontgaan; C. altyd deur te voer sonder dat u daaraan herinner moet word?	Whenever you think of something small to do or buy, are you inclined to: A. forget it until much later; B. note it down so you don't forget about it; C. do it without being reminded about it?
15.	Kan u: A. gemaklik met omtrent enige iemand praat vir so lank as dit nodig mag wees; B. baie vind om te sê aan slegs sekere mense of onder sekere omstandighede?	Can you: A. converse easily with anybody for as long as necessary; B. converse only with certain people under certain conditions?
16.	Wat dink u is die grootste fout: A. om te veel warmte te toon; B. om onsimpatiek te wees:	What, according to your view, is the biggest mistake: A. to show too much warmth; B. to be unsympathetic?
17.	As u 'n onderwyser was sou u eerder kursusse wil aanbied wat: A. die teorie betrek; B. feitelik is?	If you were a teacher, would you have preferred to conduct lectures: A. covering the theory; B. covering the facts?
18.	Wanneer dit vooraf bepaal is dat u iets spesifieks op 'n bepaalde tydstip sou onderneem, ondervind u dit: A. aangenaam om dienooreenkomstig te kan beplan; B. 'n bietjie onaangenaam om aan bande gelê te wees?	If it is predetermined that you are to do something specifically at a fixed time, do you feel: A. pleased to be able to plan accordingly; B. discontented because it is restrictive?
19.	Sou dit nuwe mense wat u ontmoet kon sê waarin u belangstel: A. onmiddelik - dadelik; B. eers nadat hulle u regtig leer ken het?	At what stage will new acquaintances come to a conclusion about your interests: A. immediately or very quickly; B. once they know you better?

20.	In u daaglikse werk, (slegs vir hierdie item, indien twee antwoorde geldig is, merk albei), vind u: A. dat u nogal 'n noodgeval wat u teen die tyd laat werk, geniet; B. dat u dit haat om onder druk te werk; C. dat u gewoonlik u werk beplan sodat u nie onder druk hoef te werk nie?	In your daily routine, (if two answers are applicable, encircle both) do you: A. enjoy working against the clock in an emergency; B. do not like to work under pressure at all; C. normally plan in advance to avoid working under pressure?
21.	In 'n groot groep: A. stel u meer dikwels andere voor; of B. word u meer dikwels voorgestel.	In a group situation: A. do you introduce other people more often; or B. are you being introduced more often?

DeeL II: Watter woord uit elke paar A & B verkies u? (Omsirkel A of B)
Part II: Which word out of each pair A & B do you choose? (Encircle A or B)

22.	A. medelye ("compassion")	B. vooruitsiendheid ("foresight")
23.	A. stiptelik ("punctual")	B. tydsaam ("leisurely")
24.	A. geregtigheid ("justice")	B. barmhartigheid ("mercy")
25.	A. produksie ("production")	B. ontwerp ("design")
26.	A. fondament ("foundation")	B. spiraal ("Spire")
27.	A. teer (sag) ("gentle")	B. ferm ("firm")
28.	A. onkrities ("uncritical")	B. krities ("critical")
29.	A. kalm ("calm")	B. lewendig ("lively")
30.	A. teorie ("theory")	B. ervaring ("experience")

31.	A. letterlik ("literal")	B. figuurlik ("figurative")
32.	A. verbeeldingryk ("imaginative")	B. feitelik ("matter-of-fact")

APPENDIX C

SUMMARY OF ANALYSIS OF VARIANCE FOR PERSONALITY TYPE

Source	DF	Sum of Squares	Mean Square	F-Value
Model	3	0,34	0,11	0,55
Error	63	12,98	0,21	
Total	66	13,32		

SUMMARY OF ANALYSIS OF VARIANCE FOR LOCUS OF CONTROL

Source	DF	Sum of Squares	Mean Square	F-Value
Model	2	0,02	0,01	0,06
Error	54	0,89	0,18	
Total	56	9,91		