THE RELATIONSHIP BETWEEN RECREATIONAL TECHNOLOGY USE AND ATTACHMENT STYLE

by

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SUMMARY

The study investigated whether a relationship existed between using technology for recreation, and attachment style with important individuals in the lives of respondents.

The main results showed that (4) a decrease in friend anxiety contributes towards an increase in the positive attitude towards using the HES for explicit content; (5) An increase in romantic partner anxiety contributed towards an increase in the positive attitude towards using the HES for social replacement. (6) Decreased father avoidance and increased father anxiety lead to an increasingly positive attitude towards using the PC for social, romantic and sexual improvement; (7) an increase in mother avoidance and anxiety, partner anxiety and friend anxiety contributed towards an increase in the positive attitude towards using the cell phone for explicit content and relationship related activities.

KEY TERMS: Recreational technology; attachment style; avoidance; anxiety; Home Entertainment System (HES); Personal Computer (PC)

CHAPTER 1

INTRODUCTION

1.1. JUSTIFICATION AND DEVELOPMENT OF THE STUDY

Ever since I can remember, I was made aware of the 'fact' that certain types of technology in life, is 'bad' for you if used too much. The types of technology that were specifically 'bad' when I was growing up were television and computers. Today I can easily add cellular phones to the short-list of 'bad' technologies. These messages of 'badness' came from parents, teachers, preachers and various other so called experts (Friedewald, 2000; Yegyazarian, 2005). The messages usually came verbatim from the friends, parents, teachers and preachers. The messages from the 'experts' came from books, magazines, schoolwork comprehension exercises and believe it or not, television itself. How strange, to use television to speak against television!

Activities that were not bad, no matter how much of them you did as a youngster, were reading (regardless it seems of what it is that you read), playing outside by climbing trees, building forts, pelting one another with rotten lemons and stones and doing plenty of homework or housework. These activities were on the good list and no-one could ever be harmed by them. Too much television or computer games however, and no-one could ever tell me just how much too much television and computer was, was bad for you. No-one could ever tell me just what 'bad' exactly was and how the 'bad' would affect me. Thus I continued to spend fairly lengthy amounts of time on such 'bad' activities as I could see no real reason why not to.

What I also could not understand was why it was perfectly alright for me to use the lawnmower for lengthy periods of time, even though it was by definition technology and gave me no pleasure whatsoever, but it was unacceptable to watch videos for lengthy periods of time, television and video machines also being technology by definition, and which gave me plenty of pleasure?

Did it have something to do with how *complex* a piece of technology was that made it bad for you? Or perhaps it had something to do with the fact that one technological item could give you *pleasure* and the other not, which made it bad or good for you? Perhaps technology did absolutely nothing to me in terms of being good or bad for me. Perhaps my significant others just had *hidden agendas* to fulfill and technology was getting in the way of those agendas.

Or maybe it was simply a case of technology taking away our *time* and keeping us from spending it with the important people around us. Perhaps that was why my parents would not let us watch TV while we were eating, but insisted that we actually talk to each other (Schmitt, 2004).

I have also come to some sort of realization, through observation that in terms of technology use, there seems to be three general types of individuals namely: (1) Those that are attracted to and enjoy using technology in their daily lives, (2) Those that have a more or less neutral attitude towards technology and use it where needed as a means to an end, and (3) Those that dislike using technology and tend to avoid situations in which they need to use technology.

These experiences and reflections and many others, have I believe, contributed to my personal interest in the topic of seeing what impact, if any, voluntary technology use may be having on our psychological, emotional and relational lives.

1.2. TECHNOLOGY'S IMPACT ON THE HUMAN BEING

Clearly, technology has had a major impact on individuals and societies as far back as the stone age when humans supposedly began to use and alter their environment with technological marvels such as the spear, club, arrow and various sizes of shaped stone and bone (Rahmani, 2004) (See Appendix 7). In fact human progress has mostly been quantified as a function of technological use (Bahn, 1996; D'Alto, 2005; de Beaune, 2004). Arguably, if it was not for the development of basic technological tools with which to plough and tend the land, and with which to use and tend animals, civilization would probably never have come to pass. It seems with technology that we were able to cultivate the land and free up enough time for ourselves to begin developing more sophisticated technologies. So, instead of just trying to survive, we began to change the way we lived with technology and technology began to change us it seems. Technology, no matter how simple or complex affects us in many ways as the following extract shows:

> Over a millennium ago, Polynesian colonists landed on Rapa Nui (more commonly referred to as Easter Island), a tiny and isolated volcanic island some 2,300 miles off the coast of Chile. The civilization that developed is one of the most interesting and tragic in human history. Rapa Nui was a lush place, heavily forested by a giant species of palm tree. There were no predators and the ground supported crops quite well. As the Rapanui people's numbers exploded, their culture advanced rapidly and included their signature development – the creation of large stylised statues called moai. The statues were carved from the island's volcanic rock, but they were rolled into place all over the island on wooden logs. As moai production became an obsession with the Rapanui, deforestation soon followed, starting a chain of events that would destroy this civilization. As the trees disappeared, the island's topsoil washed away in the rain. Crops began to fail, and the large population – some 10, 000 people on 64 square miles – began to starve. Facing resource scarcity, the once-peaceful culture fell into civil war and atrocity (Coffin, 2005, p.4).

A technology as simple as carving a stone and rolling it on wood to a desired location, benign in itself, can have the potential to destroy an entire civilization.

Yet, it is from this basic technological foundation that basic tribes, communities, societies, civilizations and empires could rise (Cornelissen, 2002).

In fact, even modern civilizations today could not exist if it were not for commercial agriculture which has become increasingly influenced by mechanisation, scientific research, genetic modification and a whole host of other technological developments. To a large extent we are now using state-of-the-art technologies in order to undo the damage that other technologies, such as chemicals and chemical weapons, have caused in an attempt to regain or increase the yield of the land (Metz, 2003; Newspaper source: New Strait Times (Malaysia), 2004; Schjønning, Elmholdt & Christensen, 2004; Servat, Najem, Leduc & Shakeel, 2003; Skinner, 2004; Web source: Asia-Pacific Biotech News, 2003; Wild, 2003).

As some would propose, the single greatest revolution brought about directly through technology was the Industrial Revolution in Europe in the 1800s. There seems to be two main polar views on the reason why the Industrial Revolution occurred. The first being due to the development of technologies such as the steam engine and mechanical mills and looms which were too large to house in domestic settings. This resulted in large machines being placed in one location and people leaving their houses to work at factories under hierarchical structures of management. The social impact on domestic and work life was as a result changed by advancements and developments in technology. On the other hand, some proponents of social change proposed that changes in the organisation of work and labour led to the creation of centralized and hierarchically controlled work places such as the textile mill (Mellor, 2005).

Arguably the greatest technological revolution to affect humans since the Industrial Revolution has been the advent of the information age. Information technology in the form of personal computers, the Internet, multi-media and cellular technology has had a dramatic effect on the way we live and work and as I would like to argue, how we play and relax. Many proponents of technology will have us believe that these technologies make our lives easier, more enjoyable and more fulfilled, but as the extract below indicates, this is not always the case.

> *For high combined use of computer and mobile phone at baseline was associated with increased risk of reporting prolonged stress and symptoms of depression at follow-up , and a number of short message service (SMS) messages per day was associated with prolonged stress. Also online chatting was associated with prolonged stress, and e-mailing and online chatting were associated with symptoms of depression, while Internet surfing increased the risk of developing sleep disturbances* (Thomée et al., 2005, p.1).

Almost as insidious as technology is in our working lives, so has it become in our recreational lives. Yes, technology has arguably been used for pleasure since the dawn of humanity. From throwing a javelin or launching an arrow at a sporting contest to driving a multi-million dollar Formula 1 race car down a raceway, technology is with us even in our pleasure and leisure times. Technology is not merely a means to an end but also a means to enhance or diversify our insatiable need for pleasure.

The old saying goes, “Too much of a good thing can be bad”, but another saying has also risen up alongside it stating, “Too much of a good thing is never enough”. Regardless of which one you may prefer, is there really anything for us to worry about? After all, it seems that technology is merely a symptom of our humanity. However this ‘symptom’ could be influencing our humanity as it so evidently seems to be doing and if so, I believe we need to know what exactly it is doing to our human lives.

CHAPTER 2

TECHNOLOGY AND PSYCHOLOGY

2.1. BACKGROUND

The study will attempt to determine what the relationships are of certain technological advances, i.e., Home Entertainment Systems (HES), Personal Computers / Laptops (PCs), Cellular Phones (CELL) and lastly Personal Digital Assistants / Palmtops / Palm Pilots (PDAs) with Attachment Style. There are many other technologies available to the human being with which to keep himself entertained during his/her recreational time, but by selecting what I believe to be the most common and all pervasive 'recreational technologies' of our present day and age, I will simply try to get as accurate an idea of how these technologies may be related to our social relationships. Thus I have not made an attempt to be exhaustive in terms of identifying and analyzing all possible available technologies that may be used for recreational purposes or the literature associated with them.

As will be seen from the following literature study, much is written about the psychological effects of technology such as how violence on television increases aggressive behaviour in children or how exposure to computer technologies can provoke and increase anxiety levels. However there is virtually no literature that deals directly with the relationship between technology and attachment styles. Ample has been written about Attachment Theory and Attachment Styles and an attempt will be made to be as inclusive and exhaustive as possible on the domain of attachment.

Thus all available and relevant literature regarding the four types of technology will be discussed and elaborated upon in order that the reader may get a broad and hopefully accurate overview of what has been done in terms of social research on technology, what the technologies consist of and what their possible relationships have been or will be on the individual.

2.2 RECREATIONAL TECHNOLOGY AND HUMAN PSYCHOLOGY

2.2.1 What is the relationship between technology and humans?

What is the effect of technology, especially on our social and recreational lives? Many will proclaim that technology has enhanced our social and recreational lives, generally changing our lives for the better, but is this the case? Mobile phone technology has enhanced our ability to communicate with friends and family on weekends and holidays, but it could likewise be damaging our relationships in some way with the very people we are trying to communicate with. The way we conduct our social interactions may pre-dispose us to communicate and to relate to others, either directly or via technology. Perhaps the manner in which you relate to others influences what technology you use, how much you use it and for what you use it.

Of major concern to Anita Borg, a technology scientist at Palo Alto in the US, is the ever increasing 'technology gap' between those who have been exposed to technology, can use technology and make decisions regarding technology, and those minorities groups such as women who are largely excluded from the world of technology (Edwards, 2000).

This tendency can be seen in most developing and developed countries simply by looking at whom the technology marketers of the world focus on most. Technology is directed mainly at the young and male consumer. This is especially pervasive in the information technology sector as most forms of entertainment such as computer games are designed to attract the attention of male gamers. Very, very few cater for the interest of the female entertainment seeker. Even though marketers and game designers have attempted to cater for the female market, they still fall terribly short of the mark. Even though research has shown that the majority of computer gamers are male and over the age of 30 (Many, 2004), most are targeted at the younger market. It is just that the older individual has the spending power to buy more of it as apposed to the teenager who has to rely on the pocket of his or her parent.

In terms of cellular recreation and the likes of ring tones, wallpapers and screensavers, more 'progress' in terms of catering for females is evident, yet still falls far short from being equal with what is available for males. Note that in South Africa it is largely the poor, unemployed and generally black population groups that are falling behind the ever growing 'technology gap'.

Even though some significant steps have been taken in order to address this problem in South Africa and abroad, research conducted for example, on computer phobia via reviews and meta-analyses has found that despite the interventions introduced in order to reduce computer phobia in the tertiary student population in general, no significant change has been detected over the last few years (Anthony, Clarke & Anderson, 2000).

Likewise, technology has enabled humans to free up additional ***time***, specifically and most importantly, decreasing the time needed to do manual labour type tasks in order to sustain him physically. This has enabled humans to allocate much more time to thinking, resulting in the development of more complex technologies, skills, ways of life and ideas. Gramm (1987) states the following, "In pre-industrial, low-consumption societies, the bulk of human labour is manual; that with the division of labour the shift is towards an increased proportion of skilled and intellectual work that embodies elements of direct satisfaction and shades imperceptibly into leisure" (p.171). As Gramm (1987) states, another by-product of technology, has been the supposed increase in ***leisure time***. The argument is that, because humans use technology, they are able to do more work in less time, essentially freeing up additional time in which they can do other things, such as relax and spend time with significant other individuals in their lives (Mally, 1997). All fair and well. But what about the other side of the coin? Technology may give us additional time with which to do whatever we want, such as spend time with friends and family, but it may also in a sense take it away from us by encouraging us to use technology even more during our additional free time (Machrone, 2003; Raeburn et al., 1999). Technology generally makes tasks more complex rather than simpler, which robs valuable time from employers as well as employees. Not to mention the time and money spent on training in an attempt to educate users on how to use technology more efficiently.

"A backlash is building against America's work epidemic. More employees are resisting companies' demands for longer hours on the job, the 24/7 pace of business that means operations never cease, and the surrender of **leisure time** *to work because of new* ***technology*** *such as cell phones and e-mail"* (USA Today. December 17, 2003*).*

In fact, information technology has created a multi-billion dollar global industry that gives work to millions of individuals and very often creates highly stressed employees that work around the clock.

Mullan (1997) states in his book, "Consuming Television" that, "Virtually everyone in the so-called developed world watches a box in the corner, with the British, for example, totalling over 50 billion hours of television viewing a year. If a typical viewer's total viewing during the year were laid end to end, it would fill two months for 24 hours each day" (p.5). Simply put, two months in a year is a lot of time that could have been used doing something else such as spending precious time with loved ones or engaging in a leisure activity that is both more sociable and more physically active. Following on from this, ***time*** spent on technology, will be one of the important factors that will be investigated within this study.

What is also prevalent in the literature is that technology has the ability, either directly or indirectly to elicit emotional responses from its user. As Taylor and Mullan (1986) exclaim:

> Sometimes it is watched with great intensity and emotional involvement (quite enough to produce tears of sorrow or tears of joy): at other moments, with an irreverent concern (in which actors and plot readily become more laughing matters). In both cases it is likely to be a subject for conversation and comment among those present either during or after the specific programme. And whatever may have been the case in the past, nowadays, with at least four channels available and a pre-recorded film for hire a few hundred yards down the road, choice is likely to be continually exercised…

Please note that the above extract was from 1986. Today we have 50 or more channels to choose from and High Definition Interactive Television is just around the corner. Although 'television conversation' may often be about the comings and goings of fictional characters or 'personalities', they provide ways of talking about a great many other features of the world: sex, sin, retribution and death.

Emotions help us to evaluate things such as objects, situations, ideas, people and places. Thus emotions to a large extent make up our attitudes towards various objects, situations, people, ideas or places. Attitudes can be viewed as evaluations of various objects, situations or ideas (Judd et al., 1991). Thus simply put, an attitude towards an object, idea or situation helps you to define and determine very quickly whether you like or dislike the object, idea or situation.

According to Baron and Byrne (1994), attitudes are formed in primarily two ways, namely by learning, which is largely but not exclusively an intellectual activity by which positive or negative associations are made with the object at hand in relation to other humans, and also by direct experience by which the object at hand is experienced in a negative or positive way. The experience is intellectual in nature but also contains a strong emotional component. Thus attitudes are made up primarily of emotional and intellectual evaluations in relation to an 'object' which is stored in the memory and retrieved in the actual or imagined presence of the 'object'.

Consequently, ***attitudes*** towards recreational technology use will be a second factor to be investigated. The literature shows that, if you have a positive attitude towards an object or idea, you will use it, spend more time on and with it and be more likely to support it. Therefore I may determine, for example, whether there is a relationship between positive attitudes in general towards the Internet and time spent using the Internet. If you are positive towards the Internet you will more likely use the Internet and probably use it more than someone who has a negative attitude towards the Internet.

"Attitudes and behavior, it appears are often closely linked. In general, though, attitudes do predict many forms of social behavior across a wide range of contexts" (Baron & Byrne, 1994, p.137).

Thus the attitudes towards the four recreational technology types under investigation, whether positive or negative will be investigated in order to attempt to further quantify the likelihood that an individual will use technology.

For the purposes of the study it will be assumed (in line with current theory by Baron and Byrne (1994)) that a positive attitude towards a certain technology type in general, will incline an individual to use that specific technology more than an individual who has a generally negative attitude towards a specific technology.

So clearly psychological variables do influence technology use and technology can have a significant impact on the psychological frame of mind of an individual.

A third important factor that will be investigated within this study is whether socio-economic status has an effect on technology use. I would propose that if you earn more money, then you have the potential to expose yourself and your immediate others to more technology purely by being able to afford more of it (Jones, 2004; Raeburn et al., 1999). Likewise, if you are interested in utilizing technology, then I would propose that you would invest more in it in terms of money and functionality. By increased functionality I mean that you will purchase a cell phone, personal computer, home entertainment system or personal digital assistant that has more features, can do more and costs more than the average product (Machrone, 2001).

Granovetter (1985) argues that technology has the ability to enhance relationships due to increased and speedier contact and social transaction. However, he reports that the advantages of technology can only be realized once a relationship has already been established.

He does not state whether it is possible to establish a relationship via technology such as meeting people in chat rooms as the technology to do this via information technology was not available yet.

The development of the Internet and additional technologies such as web-cams have made phenomena such as chat rooms, Internet-based electronic dating services and match making services possible. Therefore it is now possible to actually create relationships through the use of some recreational technologies. As Parks and Floyd (1996) and Zaczek (2004) have stated, information technology, in the form of Internet usage for example can facilitate the building of social relationships by virtually and potentially putting you in contact with everyone and anyone on the planet. Granovetter (1985), however, does note that technology can be used to enhance relationships and communication, or alternatively to replace it by isolating individuals, departments, organisations and societies from one another.

In conclusion, it is plain to see from this literature review that the relationship between technology use and human relationships is a complex one. I believe that this is all the more reason why extensive research should be conducted on the effects of technology on our daily lives, so that we can clearly identify where the benefits of technology lie and where technology has become detrimental to our daily physical, social and spiritual lives. As technological developments continue to yield different forms of technology, as well as make technology more and more pervasive in societies, I believe it will be a continuous endeavour if not a responsibility for social scientists to explore and monitor the effects and relationships of technology on everyday human life.

Clearly, being the creators of technology, we influence the direction in which it develops and the way in which it is used. However I believe we need to be very cautious in terms of what it is doing to us as the following quote by Winston Churchill in 1943 (The Churchill Centre) illustrates:

"We shape our buildings and afterwards, our buildings shape us" (Churchill, W., n.d.).

I believe that the same can be said for technology.

Now social attachment, attachment theory and attachment styles will be discussed, as well as its possible implications when put into the context of recreational technology use.

2.2.2 Information technology

According to Kasschau, Lachman and Laughery (1982), *information technology* is all about computers and communication. It would be very difficult to argue that the advent of computer technology was not in essence the onset of the information age.

Early computers were originally developed out of work related to the predictions of the trajectory of projectiles during World War II. Even the Internet was initially developed for the US defense forces as a means to ensure communication redundancy in the event that a hostile attack may be made on its communication infrastructure (Croarken, 2002).

As computers advanced and became smaller and more accessible and their uses increased, so did their popularity amongst scientists and eventually every sector of modern day life.

Whether you are a systems programmer for NASA, a cashier at a corner café or a toddler in a nursery school, chances are you will be spending some of your time, if not most of it in front of the display screen of a computer. Virtually anything today can be mediated by a common desktop computer, provided that the necessary attachments (if needed) are in place. If there are a handful of activities that cannot be done or attempted with a computer, like thinking intelligently as a human does, procreating as a human does and worshipping a superior being as a human can, then you can be assured that there is probably at least one person working on making that a reality, however futile and irrelevant the endeavor may seem to some. Perhaps this has prompted the relatively recent and rapid increase in the interest of information technology ethics. The global proliferation of computer technology has led to the questioning of the enormous potential for good or evil that these technological devices could mean.

Clearly there are obvious positive as well as negative aspects of computer usage such as having access to global information at the click of a button, or enhancing the effectiveness of weapons in order to wage more effective war. However, it is the more subtle potential effects that draw social scientists and others to question the effects of these creations.

Using a computer and the Internet at home can lead to increased knowledge and skills as well as confidence (Lundmark, Kiesler, Kraut, Scherlis & Mukhopadhyay, 1998).

On the other hand when individuals use information technologies for playing computer games or retrieving information, they use up time and spend more time alone (Vitalari, Venkatesh & Gronhaug, 1985).

Other research suggests that recreational computing at home appears to be displacing another radical form of information technology use, namely watching television. (Kraut, Mukhopadhyay, Szczypula, Kiesler & Scherlis, 1998). If you consider that even cellular phones are beginning to reach the functional and processing capabilities of multiprocessor personal computers, and you can carry it with you wherever you go, the effect it could have on the time spent using information technology out of the office and out of the home is staggering.

Clearly the complex nature of information technologies available today and the potential effects on social and recreational life that the literature and research suggest, warrants an investigation. It is for these reasons that current day voluntary information technology use will be scrutinized in this research paper.

2.2.3 What is 'recreational technology'?

As will be seen from the following four subheadings, 'recreational technology' will be divided into four specific categories. In general, 'recreational technology' can be seen as any type of technological advancement, usually electronic in nature that is used extensively for recreational purposes.

For the purposes of this study, three main technology types, commonly used for recreation were selected, namely Home Entertainment Systems, Personal Computer Systems (with Personal Digital Assistants as a subcategory) and Cellular phones. Relevant literature regarding the four 'recreational technologies' will be expounded and clarified where necessary in order to give a broad overview of where each has come from and what the latest areas of concern are.

2.2.3.1 Television as a fundamental part of the Home Entertainment System

The expression or term 'Home Entertainment System' (HES) will consist of one or all of the following components:

Monitor/Television; Big screen television; Home Theatre Projector; DVD Player; DVD Player with 5.1 Surround Sound; Video Cassette Player; Video Cassette Recorder, MNet Decoder, Digital Satellite Television Decoder; Component Surround Sound Amplifier; Kinetic Feedback devices.

As the term 'HES' here is not readily used in scientific and other literature, the term 'television' should be taken to encompass the main functions of the HES in the literature below as a television or monitor is usually the smallest basic unit of any functioning HES.

On the negative side of the spectrum, it has often been said by parents, grandparents and various other adults that watching too much TV is bad for you. Many articles, scientific and otherwise have been published in regard to the debate that television can be harmful in various ways such as by causing children, who watch violent programmes, to be more aggressive in social settings (Brodkin, 2005; Emling, 2004; Lawson, 2004; Dolliver, 2005; Saltzman, 2004; Hurst, 2004; Klein, 2003; Hibbert, 2005).

Shelley Emling (2004) reports that television has been blamed as a causal factor in attention deficit disorder as well as aggressive behaviour, but says that even though children do experience violence on TV, even in children's programmes, traditional nursery rhymes have been found to have on average more than double the amount of 'violent' happenings within them than television.

Although watching violent television has not been proven to cause violent behaviour, there is sufficient evidence to warrant that watching violence on TV can lead to desensitization and therefore a lack of concern for the pain and suffering of others (Lawson, 2004). Television also seems to have different impacts on different sexes. For example, women watching tragic events on television news were more likely to switch the television off and worry about the troublesome events viewed. Men on the other hand were generally attracted to watching tragic and violent events on the news (Klein, 2003).

There is the constant controversy about bad language, sex and nudity on the television amongst countless individuals. For some, sex, nudity and language (do not forget violence) are the ultimate evils destroying the youth and society today.

For others these are simply a matter of choice, of entertainment and of spicing up your love life, when compared to the 'real problems' of war, famine, poverty, HIV/AIDS, drug abuse and rampant corruption to name but a few (Saltzman, 2004).

Technology such as television and the Internet are having a huge impact on sexual behaviour in general. Attitudes towards sexual behaviour within, and outside of committed relationships, homosexuality, sexually transmitted diseases and other sexually related health problems such as impotence are constantly being challenged by sexual content on the television and the Internet (Garland, 2004).

According to Hibbert (2005), "Indecency activists might cause a ruckus over Janet Jackson's 'wardrobe malfunction' and Nicolette Sheridan's towel drop, but more viewers are turned off by violence and foul language than nudity, according to a new poll" (p.59).

Today we have Digital Satellite Television, DVD players, Big Screen TVs and projectors, Surround Sound and even devices that cause the furniture in your house to shake whenever an explosion occurs on the screen. Overloading the senses with intense artificial stimulation seems to be the order of the day. For some this is exceedingly bad due to the fast flashing images of programmes and advertisements being blamed for causing anything from subliminal brainwashing to epileptic seizures.

On the positive side, however, as Hetherington and Ross (1975) report on *perceptual-deprivation* studies conducted on infants in the 1960s, infants exposed to large amounts of artificial stimulation had far fewer developmental delays and disorders as compared to control groups that were deprived of the artificial stimulation. Thus it seems, at least for infants, that artificial stimulation is ultimately good for you, even though it would be difficult to draw neat boundaries around what is 'artificial' and what is 'natural' in terms of stimulation. It may be that things may be no different for adults. TV could make you more intelligent and better adjusted to your external environment as an adult at least in some ways of development. Television has the ability to change your beliefs and values as has especially recently been witnessed in the Middle-East. Television is increasingly being used to target abused women, who have been beaten by their husbands who 'misinterpret' the Koran when it comes to exercising authority over their wives (Rassmussen, 2005). Also do not forget the ever growing 'Educational Television Movement' who attempts to reach out to millions of preschool and disadvantaged children in order to provide them with some sort of elementary life skills and academic exposure. This is especially prevalent in South Africa today as social and educational reforms are hot on the agenda of political departments and activists.

It seems as though technology is favoured by many as a means to enhance the lives of individuals and groups via changing their beliefs, being a portal for education and keeping people informed as to what is happening in the world around them, as well as being tools with which to more efficiently make money. However there seems to be a bias towards using technologies purely for enjoyment purposes.

It seems that there is a general stigma in westernised societies that disapproves of using technology for enjoyment as opposed to economic, educational and information related activities. As has been argued earlier and from literature to follow, it will be seen that these concerns may have a legitimate origin, but that large grey areas still exist in scientific literature.

From a more psychological perspective, television could play a supportive role in coping with and treating emotional disturbances. According to Pearlin (1959) people generally try to escape from the pressures and stresses of life by watching television. What if individuals also watch television in order to cope with the stresses and pressures of life? When looking at Post-traumatic stress disorder, many individuals suffering from the ailment complain of emotional numbing. During a personal interview with a psychologist on the topic, she admitted to prescribing television as an aid to recovering the ability to experience emotional feelings. More specifically, movies heavily laden with emotional content in order to elicit emotions from the viewer were prescribed. Just as children watch television in order to escape from a hostile world into a safe fantasy world, so can they watch television in a safe environment in order to cope with some of the emotional damage done by an ever increasing hostile reality. Television has a huge potential for good, yet seldom seems to be utilised in such a way (Kenyon, 2002).

2.2.3.2 Personal Computer / Laptop usage and its effects on users

Computer games and the Internet (e-mail included) have for various reasons been labelled as the scourge to communication, a plague to leisure and the source of many marital, behavioural and moral problems as well as creating developmental disorders in children. Much research has been done on the relationship between computer usage and anxiety. For example, Ceyhan (2004) found that there was a significant relationship between pessimism towards computers, irrational beliefs, and the fear of self-disclosure when compared to anxiety experienced when using computers in general. Anxiety towards computers had absolutely no significant relationship with intellectual resourcefulness. Thorpe and Brosnan (2005) found that anxiety levels experienced in relation to computer usage, could reach the extent where they could be classified as a pathological specific phobia according to DSM-IV criteria.

Mcilroy, Sadler and Boojawon (2005) found that in line with previous research, self-reported computer phobia, and self-reported computer self-efficacy was significantly related to overall computer usage. Thus a positive attitude towards computers was positively correlated with frequency of computer use, and *vice versa.*

According to a follow-up study done by Thomée, Eklöf, Gustafsson, Nilsson and Hagberg (2005), symptom free individuals at the time of baseline recording, were followed up after one year. It was discovered that on-line chatting, Internet surfing and e-mailing was associated with increased stress, depression and the development of sleep disturbances.

On a more interactional stance, Banks (1998) states her concern for the effects of computer based classroom teaching and online teaching in general. She exclaims that when teachers are replaced with computers, or when students are given the opportunity to "hide" behind computer monitors, the interactional effect of student-teacher education is lost. All non-verbal communication which some researchers say, makes up 70 to 80 % of all communication is lost and cannot be included as part of the teaching environment. Basic assumptions cannot be challenged by online learning; for example the expectation that a university professor should be an elderly white male, when in fact she could just as well be a 32 year old African–American female. Interaction with real people has the ability to challenge stereotypes whereas computer based learning cannot do this experientially.

Harris (2000:45) states the following on a study conducted in San Francisco - USA, "Too much time online makes people more likely to go offline in real life". The more hours individuals spent online, the less time they spent interacting with other people. "The Internet could be the ultimate isolating technology that further reduces our participation in communities even more than television did before it," according to Norman Nie, the researcher who conducted the study.

Barbara Meltz (2005), a reporter for the Boston Globe, wrote an article after researching the lives of four troubled teens. She placed being addicted to computer games on the same level as being addicted to drugs such as mushrooms, acid, Ecstasy, Special K and heroin.

This may sound extreme to some but considering the havoc being wreaked by obsessive gambling not only in terms of financial loss but primarily in terms of the neglect to family and friends, it would be safe to assume that it is possible for computer games to have similar effects on relationships. An important fact to take into account according to Gloria Goodale (2005), is that computer and video games are beginning to compete with the box-office sales figures of the movie industry and show no signs of plateau or decline.

Studies provide other reasons as well which point to the possibility that computer and video games are bad for teenagers. Of primary concern for most critics and concerned parents is the pervasive violence to be found in almost all computer games marketed for teenagers. In many games many characters "die" per hour of computer game-play. Apparently this will lead to players fantasizing about killing, which is of course in most contemporary societies seen as heinous. Another issue of concern is the apparent contribution that computer and video games may be making to the increasing 'scourge' of obesity amongst developed and developing nations.

Gentile (2005) states, "Looking across the dozens of studies that have now been conducted on violent video games, there appear to be five major effects. Playing violent games leads to increased physiological arousal, increased aggressive thoughts, increased aggressive feelings, increased aggressive behaviors, and decreased prosocial helping" (p.10).
On the other hand though, according to Professor James Paul Gee of Wisconsin University, there are many benefits to playing computer games.

For example, computer games teach individuals to think strategically, to manage multiple problems at once, balance short and long-term goals, and deal positively with frustration and anger and to think quickly. Also, individuals have a 'safe' space in which to escape from everyday difficulties of life instead of engaging in self destructive behaviours [such as drug-abuse and joining street gangs] (Anonymous source: *Scholastic Scope*, 2004).

On a more positive note, for those suffering from ADD (Attention Deficit Disorder) or AHDD (Attention-Hyperactivity Deficit Disorder) the following claim is reported:

"The Play Attention Learning System, a new product from Unique Logic and Technology, uses computer technology to help students with behavioral and attentions problems-such as ADD and AHDD-by training their brains to pay attention and focus better" (Anonymous source: *Principal Leadership*, 2005, p.55).

Dryer, Eisbach and Ark (1999) point out the following in terms of the social and relational effects that information technology is having:

"With the advent of pervasive systems, computers are becoming a larger part of our social lives than ever before. Depending on the design of these systems, they may either promote or inhibit social relationships. We consider four kinds of social relationships: a relationship with the system, system-mediated collaborative relationships, relationships with a community, and interpersonal relationships among co-located persons.

In laboratory studies, the design of pervasive computers is shown to affect responses to social partners." (p. 652).

Thus the impact of technology on social relationships depends on the proposed function, structure, purpose and intrusiveness of the information technology system as a whole. Simply put, just as a personal computer can be used to improve academic performance, enhance business productivity and quality or communicate with distant loved ones, it can likewise with little or no structural or functional changes, be used for an alternative range of purposes (such as viewing sexual content or engaging in an affair outside of a current monogamous relationship) with resultant implications for intrusion.

Regarding gender and psychological factors with regard to recreational computer usage, McClure and Mears (1984) found that those who played computer games were in general male and intelligent. A reason suggested for this is that males in general possess better viso-spatial skills when compared to girls (Sanger, Willson, Davies and Whittaker, 1997). Thus there appear to be gender differences that could influence technology use on a recreational level. These gender differences seem to stem mainly from the psychological differences between the sexes in general (Chou & Tsai, 2004).

When combining computer technology with the Internet, some findings from China reveal the following:

"According to CNNIC's 15th Statistical Survey Report on the Internet Development in China, people use the Internet most often to search for information about education, automobiles, and recruitment opportunities. E-mail, according to the report, along with online banking, trading, and gaming, are also growing rapidly" (Ashling, 2005, p.1).

Even though online-shopping is still lurking back in the recesses of e-commerce, fascinating advancements are continually being made in the area which are leading to an ever growing interest in and use of online-shopping. For example, a fair number of e-commerce type sites now allow you to do comparative shopping, instantly comparing like or different products in terms of quality, quantity, appearance, value and of course price before you click the mouse button and have them delivered to your home (Prescott, 2005). More time for the children, less exhaust emissions from the car, no annoying beggars, car guards and welfare people at the shops and no need to get dressed to kill in order to impress all those people who do not care about you anyway, because they are already too engrossed in thinking about what you are thinking about their latest wardrobe ensemble.

Thus it seems that the more of your daily tasks you can do via the Internet, the less need you have to leave your office or home and the less interaction you will have with other people. Some people will argue that this is not bad however, because now you get to spend more time socialising with the people you really care about anyway. However, if you for example have a pre-existing social anxiety disorder, this could make things worse as it provides a very effective means for avoiding social settings even more.

According to Zaslow (2003), getting online can be very good for you in certain respects. For example, Mr. Kenneth Roberts who was married to the late Mrs. Roberts has created an entire website to his late wife called *Remembermyjo.com*. In this way he has created for himself a therapeutic and healthy space in which he can honour the love of his life and share his experiences of his relationship with the world.

According to a study done by Zaczek (2004) entitled, On-Line Friendships, it was found that for shy and less sociable individuals, "the Internet is a safe place for building personal relationships" (p.122).

Fred Ramirez (2001), an assistant professor in the Department of Secondary Education at California State University has proposed using technology in order to communicate with parents of students, in order to facilitate parental involvement at the school. "Teachers often indicate that they do not have enough time to effectively communicate with all parents, but by creating a distribution list of parents with e-mail addresses, for example, teachers can easily notify them of upcoming events" (p.30). Clearly, getting parents involved in their academic lives in a positive way could radically alter their educational and relational futures.

As far as sexual behaviour is concerned, it has become very apparent that computer technology has had an impact on how individuals conduct their sexual lives.

This is especially so when computer technology is combined with access to the Internet. A study conducted on Canadian university students found that the anonymity that computer technology allows in terms of concealing personal identity, greatly influenced the extent to which individuals would engage in viewing and disseminating sexually explicit material via the Internet and e-mail. Although computer technology did not change the way individuals perceived sexual content as either pleasurable or repulsive, it did however seem to positively influence the amount of time individuals spent conducting sexual activities via information technology (Byers, Menzies & O'Grady, 2004). What can be said for this is that at least at present, sexual activity online and on computer is "safe sex" without the risk of contracting sexually transmitted diseases such as HIV. Activists against pornography, however, would probably argue that viewing sexually explicit material via information technology may have the effect of motivating individuals to take their sexual activities out of cyberspace and into reality, exposing themselves and others to the myriad of sexual problems that exist in the world today such as STD's, teenage pregnancy, rape, child pornography, paedophilia and the like. But even if more porn does not create more perverts, clearly there is a booming market for it, which indicates a desire or need that needs satisfying. As with most things, there is generally a right way and a wrong way to satisfy human needs. Perhaps it is better to satisfy potentially destructive desires in cyberspace rather than being left to do it in reality where harm can be done.

A study conducted by Yang and Tung (2004) on Internet addiction revealed that both Internet addicts as well as non-Internet addicts perceived using the Internet as a means to enhance social peer relations.

Also, individuals characterized with certain negative psychological characteristics such as depression, dependence and low self-esteem were more inclined than their counterparts to become addicted to the Internet. These findings have also been found for other types of addiction such as drug and alcohol addiction and obsessive gambling.

Support groups such as the AA (Alcoholics Anonymous) and others have established online support groups and news groups via information technology and the Internet in order to reach individuals in logistically remote areas and as additional support for standard support meetings and groups (Van Lear et al., 2005).

As can be seen from the above section on personal computer usage, the psychological and social effects can both be negative and positive, depending upon variables such as whether games are violent or not, how much time is spent using it, what the technology is being used for and who uses it, to name but a few. This becomes more complicated when combined with the Internet, as it adds a host of possibilities that can be either beneficial or detrimental. Clearly any form of research on personal computer use is direly needed in order to better understand the psychological and social effects on the human being.

2.2.3.3 Personal Digital Assistants / Palm Tops / Palm Pilots

Let me first start with a definition in order to clarify what this entails:

"A small computer that literally fits in your palm. Compared to full-size computers, palmtops are severely limited, but they are practical for certain functions such as phone books and calendars. Palmtops that use a pen rather than a keyboard for input are often called hand-held computers or PDAs.

Because of their small size, most palmtop computers do not include disk drives. However, many contain PCMCIA slots in which you can insert disk drives, modems, memory, and other devices.

Palmtops are also called PDAs, hand-held computers and pocket computers" (Anonymous: Webopedia.com).

For all the hype and advertising in the media, PDA's are seemingly still only to be found in the hand of the high-powered executive. The device does not seem to have taken off as has been expected. For all intensive purposes, the PDA is simply a glorified digital diary. Yes, the capabilities and functionality of the devices improve daily, even though the market does not see it until months later. They are capable of doing things like retaining memos, phonebooks, allowing you to check your email, surf the Internet via connecting to expensive service providers such as GPRS or the latest G3 technology. You can even play games, take handwritten notes with your stylus (pen-like input device), and put full colour pictures of the latest swimsuit model on the background before the battery runs out after 8 hours or so.

Some schools in Europe and America that have the money to supply entire classrooms with the devices are heralding it as the next technological breakthrough in education – probably because the teachers will be able to program them with reminders for the students to 'actually' do their homework whilst out of their watchful eye. It seems more plausible that they would send each other SMSs, browse the Net or play the games that are available instead of educating themselves (Kadel, 2005).

Advancements in software for the tiny devices may provide for some interesting future capabilities to the devices. One may ask however, whether cellular technology has overtaken the PDA industry? It seems that any advancement that is likely by way of the PDA, is likely to be, or is already incorporated into a cellular handset (Lynch, 2005). Thus why bother carrying around a PDA when your mobile phone is one, and so much more anyway? It seems doubtful that the Palmtop will see the turn of the decade, much to the disdain of all those who have invested much money into them and are marketing them furiously.

2.2.3.4 The Cellular Phone

The use of cellular technology, such as in the form of the cellular phone has become extremely pervasive in the last 20 years. Even the poorest of the poor probably own one. In Africa, which is probably the poorest continent on earth, cellular technology has had the greatest amount of growth by comparison to any other region on the planet according to Buttler (2005) (see figure 2.1 on the next page).

Number of cell phone users in Africa

In 2001, Africa became the first region where the number of mobile subscribers exceeded those using fixed lines

Year		Subscribers
1998		2 million
2002		28 million
2003		51 million
2004		82 million

Year-end figures
Source: International Telecommunication Union (ITU), *The Economist*

Figure 2.1 : Number of cell phone users in Africa (Retrieved August 2, 2005, from Mongabay.com)

Most already know about the cameras, MP3 players, radios, Internet connectivity, sports news, e-mail, SMS, MMS and downloadable ring-tones, backgrounds and nudity. What fewer people know is that this is only the tip of the iceberg. If not already, then soon you will be able to pay your accounts, do your banking, switch on your lights, pool, computer, kettle, cappuccino maker, check out your children's school reports, scan the barcodes of goods in the shopping centre for prices, expiry dates and acquire a detailed nutrient and ingredient analysis, as well as keep an eye on the nanny from the secret webcams at home, from your phone. In a nutshell, if you can think of it, it will be done, sooner or later by your phone (Anonymous: *The Economist*, 2005, p.8). As a relative once noted, "the mobile phone will become your remote to life".

Will this free up our time to spend with friends and family, or will this engulf us with a flood of seemingly far more interesting frills and thrills, changing the nature of our social relationships?

What is also very noteworthy is that this technological marvel does not only attract the attention of the hip-and-happening stylish, fashion and image conscious teenager or yuppie. In fact, in developing and impoverished continents such as most of Africa, countries like Senegal are using cellular phones for their GPS (Global Positioning System) capabilities in order to track their herds as they migrate from one pastoral area to the next in search for grazing (Sylla, 2004).

For those predicting constant doom and gloom for technology and science, perhaps the following would shift some perceptions. Cellular phones are increasingly being used for altruistic purposes, and for research, in the sense that it is easier to reach respondents and conduct telephonic interviews, or to get them to SMS a noteworthy event to a call centre so that researchers can analyse variables and come up with better ways of supplying client/patient needs, but also in ways such as the following example illustrates:

*"Mobile telephones were used to collect data on the relationship between gambling and mood state from gamblers in the field. Seventeen gamblers called an interactive voice response system running on a computer before, during and after a gambling episode. Measures taken in this way included self-reports of anxiety/arousal, the amount of money gambled, whether the result was a win or loss, the amount won or lost, and the type of gambling engaged in" (*Gee, Coventry & Birkenhead, 2005, p.53).

In this case, the intrusiveness and pervasiveness of technology provides a cutting-edge tool in order to attain very accurate and real-time data in order to benefit human beings in a truly positive way.

The future of cellular technology seems to be somewhat revealed by the following excerpts:

"Late last year, Playboy launched iBod, a collection of videos and still images you can download and play back on your Apple iPod, either singly or in a slide show. More recently, Playboy has introduced a similar collection for Sony's PlayStation Portable gaming handheld. It's but a short step from there to a Playboy offering for your cell phone.

The rising interest--on the part of adult-content providers and others--in offering video on cell phones has prompted the CTIA, a telecommunications industry group, to prep a voluntary rating system for mobile phone content" (Yegyazarian, 2005, p.1).

If telecommunications groups are developing ways to keep nudity and sex in control for young cell phone users, then it would be fairly safe to say that within a very, very short span of time, the functionality of cell phones will equal that of any desktop personal computer. Thus any development in the field of information technology will directly influence cellular phones. There is already talk of mobile technology superseding computer technology. The social implications for this could be enormous as many individuals would be carrying around the equivalent of a small super-computer in their pockets (Mellis, 2005).

Lastly:

"Nokia, the largest cell phone manufacturer in the world, last week teamed up with Pointsec Mobile Technologies to develop encryption technology for smart phones based on its Nokia Series 60 and Series 80 design platforms, which run on the Symbian operating system. At the same time, Nokia also announced it will work with Vodafone Group, Europe's largest wireless operator, to drive development of a specification for an open standards-based mobile Java services architecture" (Blau & Schwartz, 2004, p.19).

What this ultimately proposes is that mobile phone developers are busy working on ways to run a fully fledged information technology operating system, such as Microsoft Windows XP, on a handheld cellular phone (Lehmann, Kuhn & Lehner, 2004).

Thus in the very near future, your mobile phone will be able to do anything and everything that your desktop or laptop computer can do. As I have already mentioned the complexities of the effects of computer and information technology on social relationships, I feel that all that needs further mention is that these resultant developments will have a major impact on our daily lives as information technology becomes even more intrusive and pervasive.

2.3 ATTACHMENT

The study requires that recreational technology be related to personal relationships in order to determine if a relationship exists between the two domains. It was decided that attachment theory is to be used as a means to probe the nature of personal relationships and make it quantifiable.

2.3.1 Attachment theory

According to Bretherton (1992) Attachment theory was developed upon Bowlby's premise that existing theories of the time were inadequate to explain the intense attachment of infants to their caregivers and the dramatic effects of their separation from the caregiver.

The theory was further extended by Mary Ainsworth (Ainsworth, Blehar, Waters, & Wall, 1978). As a result, many changes have come about in society and institutions. Hospital visiting hours have been extended, if not at all eliminated, especially where children are involved. Mothers are encouraged to spend ample time with their children and fathers are present at the birth of a child, and both mother and father are allowed prolonged contact with the newborn virtually immediately so as to maximize the positive effects of immediate bonding and attachment formation (Feeney & Noller, 1996).

Attachment theory is one of the most well-researched areas of psychology today and consists of a great deal of literature which overlaps and/or compliments many areas of modern psychology such as family therapy, childhood development, marital therapy, developmental pathology and life-skills to name but a few.

According to Bowlby (1969, 1973, 1979, 1980), it gives a biological, social, and longitudinal theoretical framework of how close relationships develop, how they remain close relationships. Thus Attachment theory also offers explanations as to why relationships become dysfunctional or are terminated at some point, and how relationships influence the individuals who are involved in them.

The theory as a whole looks at relationships and explains the various facets and happenings of close relationships from a variety of views namely from a cognitive, behavioural, physiological and emotional slant. The theory suggests that there are constructs and processes that help to explain aspects of social development, interpersonal behaviour, relationship functioning, psychological adjustment and psychopathology (Rholes & Simpson, 2004).

The primary function of attachment behaviour according to Bowlby (1973) is to ensure the survival of the individual (usually the weaker child or infant by nature of its inability to care for and sustain itself) by creating an emotional, psychological and often a physical bond (by staying within close proximity) with a stronger and / or wiser individual (usually the caregiver).

The more vulnerable infant uses the caregiver as a safe haven from which to explore the environment, and upon encountering a threatening or anxiety provoking situation, quickly attempts to return within close proximity to the caregiver for assurance, encouragement and safety. Contemporary research, however, has found that this bonding or attachment formation also applies to relationships between adults. It is in no way limited to the infant – caregiver dyadic relationship.

2.3.2 Differences in attachment among individuals

Individuals have different ways or styles of attaching themselves to their significant others. Ainsworth and her colleagues (Ainsworth, Blehar, Waters, & Wall, 1978) upon intensive observation of infant-mother attachment behaviour, identified three main types of *attachment styles.* These three styles are named according to the main corresponding behaviour displayed by individuals within a dyadic relationship.

The three styles are as follows: (1) Avoidant – characterized by detachment type behaviour and avoidance of the significant other. Care giving generally consists of a rejecting, rigid, hostile and non-physical nature. (2) Secure – characterized by explorative, responsive, and positive behaviour as well as becoming upset at separation from the significant other. Care giving generally consists of availability, responsiveness and warmth. (3) Anxious-ambivalent – characterized by protesting, anger and ambivalent type behaviour as well as becoming distressed when separated from significant others. Care giving is usually insensitive, intrusive and inconsistent.

These three *attachment styles* were identified by Ainsworth and her colleagues in a laboratory situation, by experimentation with caregiver and infant in what is today know as the Strange Situation. The infant was placed in a 'strange situation' (approached by a strange person) and systematically separated and reunited with his/her caregiver while stringent observations of the infant's reactions were made.

According to Ainsworth (1989), three main elements contribute towards the individual variations amongst attachment style, namely *individual experience*, *genetic constitution* and *cultural influences.* Most research has focused on the first two elements. Research has found that although attachment style is a function of both individual experience, such as bonding and reciprocal interactions with the maternal caregiver, as well as genetic constitution, it appears that the behaviour of and experiences of the maternal caregiver overshadow the genetic constitution component of the infant (Bowlby, 1984; Crockenberg, 1981; Goldsmith & Alansky, 1987).

Main and Weston (1981), state that it is possible for an individual to be securely attached to one parent and insecurely attached to the other. This provides another reason why caregiver behaviour is forwarded as being more influential than genetic temperamental influences from the infant's side. Attachment theory is not only applicable to the infant-caregiver relationship but also to the adolescent-caregiver relationship.

A study conducted by Violato (1996) on the differences between clinically treated and non-clinically treated adolescents found that the clinical group found their parents to be less caring as well as more overprotective than did the community group. These results are in agreement with data and theory of insecure attachment (e.g., Rosenstein & Horowitz, 1996).

With regard to attachment theory and its implications on adults, Bartholomew (1990) quotes the following:

"In recent years, several streams of research have emerged from Bowlby's (1988) and Ainsworth's (1982) attachment theory. Originally, the theory was aimed at explaining child and adult psychopathology in terms of non-optimal relationships between children and their caregivers, or 'attachment figures.' According to attachment theory, the long-term effects of early experiences with caregivers are due to the persistence of 'internal working models' – cognitive/affective schemas, or representations, of the self in relation to close relationship partners (Bartholomew, 1990; Shaver, Collins, & Clark, 1996). Theoretically, these representations influence a person's expectations, emotions, defences, and relational behaviour in all close relationships. Although the theory does not assume or require that internal working models persist without, change across the life span, both theory and empirical evidence from longitudinal studies have led researchers to suspect that the effects of childhood attachment relationships extend into adulthood, where they can be seen in the domains of parenting and close peer relationships, including romantic relationships (e.g., Bartholomew, 1990, 1993; Main, Kaplan, & Cassidy, 1985; Shaver, Hazan, & Bradshaw, 1988; Weiss, 1982)."

Thus empirical evidence has found that although attachment style may change somewhat across the lifespan from infancy to adulthood, in general attachment styles remain more or less consistent throughout life. Hence the popularity of the theory in many domains of social science and the broad foundation of research on it.

2.3.3 The effect of attachment style on human behaviour

If we are to look at what attachment styles mean for human functioning, we see that consistent, positive, protective and stable interactions with other humans within social relationships (most important during infancy), generally set up an individual to perceive significant others and society to be trustworthy, supportive and safe. This in turn helps the individual to develop a positive self-concept as well as effective and positive strategies to deal with both positive and negative emotions (Mikulincer, Shaver & Pereg, 2003).

Rholes and Simpson (2004), claim that according to attachment theory, a sense of security contributes to self-construction and effect regulation by allowing a person to benefit from the protection, support, comfort, and relief provided by loving relationship partners *(attachment figures)* during periods of stress or distress (p.159-160). Thus, if you have had positive experiences in regard to your personal social relationships, then you would most likely have acquired a *secure* attachment style.

You would then in situations of adversity and stress seek out your significant others in order to obtain support and relief from them, either by moving within close proximity to them physically speaking (especially but not exclusively as a securely attached infant) or by using internalized representations of your significant others to obtain relief on an emotional and psychological level (used mainly by securely attached adolescents and adults).

On the other hand, if you were insecurely attached to your significant others, due to inconsistent and unsupportive parenting and negative experiences within relationships which did not meet your needs for safety and security, you would theoretically not have this coping strategy at your disposal and would have to adopt alternatives in order to satisfy your needs for safety, security and comfort in some other way.

Attachment theorists have proposed two main alternative attachment strategies with which an individual can maintain his/her need for security within close relationships. These secondary attachment strategies have been given different names by different theorists, but essentially explain the same phenomena. These 'alternative' strategies consist of *hyper-activation /attachment related anxiety* and the other being *deactivation / attachment related avoidance.*

Hyper-activation results in the individual attempting to minimize physical and emotional distance by using clingy, controlling, manipulative and angry behaviour in order to get the significant others to respond in a caring and supportive way, however limited, artificial and fleeting that may be.

Deactivation results in the individual attempting maximize physical and emotional distance from significant others and adopting an independent and self-reliant attitude. It is in essence removing oneself from the need to seek support and security from close relationships (Cassidy & Kobak, 1988; Main, 1990; Rholes & Simpson, 2004).

2.4 COMPARING TECHNOLOGY USE WITH ATTACHMENT

Research by Swart and Verwey (2003), Schmelkin (2005) and Lang and Colgate (2003) suggests that technology has an impact on relationships within an organization and that using technology for communication and relationship management is of high importance. As Kling (1992) more clearly states, "Guns don't blaze, bullets don't fly and bones don't shatter by themselves. The social networks and beliefs that link shooters, weapons, targets and medical care are all important mediators between the availability of guns and social events like murder" (p.382). Or in other words, 'guns do not kill people; people (within relationships) kill people'.

Seeing that it is theoretically possible according to extensive research to classify individuals into three relatively distinct attachment categories, I believe it would be worthwhile to try to determine whether this has any form of relationship with 'recreational' technology use.

Perhaps, if you are securely attached to your significant others, you will use technology, such as telecommunications more than if you were the insecure avoidant type.

Perhaps, being the insecure avoidant type, you would rather stay at home and watch a movie on your home entertainment system alone, as your anxiety levels dissuade you from directly socializing with real people. Or maybe you would spend hours at night sending text messages via your cell phone to friends or a partner in order to stave off loneliness and insecurity. Could it be that because of your negative and unfulfilling experiences with relationships, you spend ample time on the Internet in chat rooms satisfying your need for closeness and support by communicating in a faceless, emotionless, anonymous and safe way?

As mentioned earlier in this study, there is awareness that technology affects us as social beings, and that we as individual social beings seem to be motivated differently in terms of what technology we use and how and for how long we use it during our leisure time. Very little academic research has however attempted to try to determine exactly what the relationships are between us as individuals and what motivates (or demotivates) us to use technology in our recreational lives.

CHAPTER 3

METHOD

3.1. KEY VARIABLES AND HYPOTHESES

As can be seen from the literature in chapter 2, technology clearly has a complex impact on our psychological, relational and physical lives. In no way can it be said that recreational technology is exclusively 'bad' or exclusively 'good' for us as sentient and social beings. The effects seem to vary with the type of technology used; the time spent using the technology and the attitude of the individual towards the technology. This research relates to questions that are aimed at and asked in reference to 'recreational' technology use, unless otherwise specified. Therefore unless otherwise specified by the question or context, the study looks at technology used during the leisure time of the participants. As has been described above, a negative attitude towards Internet usage could potentially be related to anxiety, whereas a positive attitude to the Internet could help maintain a long distance friendship over a potentially considerable length of time.

As will be clear from the literature survey in Chapter 2, there is a lack of published research in this area. A measurement instrument was therefore created specifically in an attempt to probe some of the complexities of recreational technology use in order to determine how it is related to attachment styles with significant others.

3.1.1 Recreational technology use

It was decided that three main types of recreational technologies would be investigated. Each technology type will be investigated in a similar manner.

3.1.1.1 The HES

The prevalence in the home of the HES (Home Entertainment System) was investigated via a self-report item. Individuals were asked if they had access to a HES at home or not. The amount of technology that was invested in the HES was measured by means of pre-defined items such as whether the HES consisted of for example, a DVD player, digital satellite decoder or component surround sound. The amount of time spent using the HES in hours per week was asked in order to determine the mean amount of time spent on the HES in general. The primary use of the HES was asked via pre-defined items such as for example, 'Entertainment and recreation' and 'Education'. It was decided to use a 5 point Likert scale in order to measure individuals attitudes towards 21 items covering topics such as whether HESs have improved social life, whether the individual had problems seeing sex on the HES and whether the HES was used as an aid in sleep.

3.1.1.2 PCs and PDAs

Once again the prevalence in the home of the PC was investigated via a self-report item. Individuals were asked if they had access to a PC at home or not. The amount of technology that was invested in the PC was measured by means of pre-defined items such as whether the HES consisted of for example, a printer, DVD-writer or graphics accelerator card. The amount of time spent using the PC in hours per week was asked in order to determine the mean amount of time spent on the PC in general. The primary use of the PC was asked via pre-defined items such as for example, 'Entertainment and recreation' and 'Education'. A 5 point Likert scale was again used in order to measure individuals attitudes towards 24 items covering topics such as whether PCs have improved social life, whether the individual had improved his relationships using the PC and whether the PC kept him or her out of doing work.

3.1.1.3 Cell phones

The structure of the questions was exactly the same for cell phones except that the content of the questions and items reflected cellular technology. Similar items for the attitude section were also asked when compared to the HES and PC attitude items.

3.1.2 Attitudes

Although some individuals may have a neutral attitude to technology, I propose that most individuals have one or more attitudes toward it. As attitudes have the potential to influence behaviour, it was deemed important to include questions in order to determine the attitudes toward the various recreational technology types. Perhaps relationships would be found between the attitudes to recreational technologies and attachment style.

A scale was developed by the researcher to measure people's attitudes to the different types of technology. This method was adopted primarily on the premise that attitudes and perception are good predictors of behaviour. "Attitudes do predict many forms of social behavior across a wide range of contexts" (Baron & Byrne, 1994, p.137).

According to Baron and Byrne (1994), attitudes are made up of four main criteria, listed and paraphrased as follows:

3.1.2.1 Attitude Specificity

Specific attitudes, such as liking Rum & Raisin ice-cream predicts behaviour more strongly than general attitudes such as liking other race groups. The more specific the attitude the more predictable it becomes (Baron & Byrne, 1994).

If I specifically like Rum & Raisin ice-cream it is highly likely that when faced with the opportunity and choice to have any ice-cream, that the individual would consistently choose to have Rum & Raisin ice-cream rather than another flavour. However having a general preferential attitude towards individuals of other race groups does not predict that you will spend lengthy amounts of time with individuals of other race groups as compared to spending time with individuals from your own race group to any significant degree. Just because I like Chinese people in general, does not mean I will spend more time with them than other kinds of people. In the same way if I like using my cell phone to send messages to my friends, it is highly likely that I will continue to do so as apposed to writing them letters. However, if I have a favourable attitude in general to technology, that does not mean I will necessarily sit in front of the computer all day on the weekend.

3.1.2.2 Attitude Components

This is made up of an affective and cognitive component. Cognitively speaking you may know that spending lengthy periods of time chatting to your friends on your cell phone will be detrimental to your bank balance as well as potentially detrimental to your health (increased risk of brain tumours) but affectively it makes you feel so good to chat to your friends at length that you continue in your present course of behaviour. Inversely you may enjoy surfing the Internet (affective component) but cognitively realize that your relationship with your wife will suffer if you do not give her some attention too. Hence you refrain from surfing the Net and rather go out to dinner and a movie with your wife.

Depending on personality and the circumstances, the components of attitudes may play different roles in predicting behaviour. Clearly however, an attitude supported by both the cognitive and affective components would prove to be strongest.

3.1.2.3 Attitude strength, vested interest and the role of self-awareness

Strong attitudes predict behaviour better than weak attitudes. In the same vein attitudes derived from direct personal experience are stronger than attitudes derived from observation.

Having a vested interest in an object or concept strengthens the attitude toward that object or concept and intensifies the attitude-behaviour link. In a nutshell, if I am interested in computer technology, I will in general be more likely to purchase and use it as opposed to me not being interested in computers.

Also, being highly self-aware in relation to your attitudes, such as knowing very well that you like watching Television, increases the likelihood that you will engage in such behaviour more.

3.1.2.4 Attitude Accessibility

Attitudes can only influence behaviour if they are present as well as accessible in our memories. If we are prompted by an object, person or concept to recall an attitude from memory, the attitude influences our perception of a seemingly neutral situation or object. If no attitude exists or if the attitude is not accessible then it cannot influence the perception of the object or situation. Thus a negative attitude towards cell phones, easily recalled into conscious awareness, is more likely to influence the individual's behaviour in the presence of a cell phone than someone who does not have readily accessible and strong attitudes towards the object or concept or person. Attitude accessibility is maintained to be a function of associative strength in that, the more an attitude forms part of your daily schematic thought patterns, the more it is accessible and therefore the more it is likely to influence your perceptions and your resultant behaviour.

An instrument was developed, incorporating the various aspects of attitudes, which can hopefully be used to measure attitudes and perceptions towards technology. This may therefore be of some use in predicting the behaviour of people who use technology.

3.1.3 Attachment Styles

Social researchers have for many years now known that attachment style in earlier life is a fairly strong and consistent predictor of attachment style and close relationship quality in later adult life (see chapter 2, section 3.2.1). It is generally accepted that a 'secure attachment style' relates to relationships of greater quality and intimacy, whereas an 'insecure attachment style' characterized by anxiety and/or avoidance relates to relationships of poorer quality and intimacy, when compared to those of securely attached individuals. It is also for this reason that attachment styles will not be looked at in terms of the three main attachment styles (securely attached, anxious-avoidant and anxious ambivalent) but rather in terms of polar opposites – either you are securely attached to someone or you are insecurely attached (anxious and/or avoidant) to someone. The reasoning behind this is that regardless of whether someone has an 'Avoidant Style' or an 'Anxious-ambivalent Style', both are characterized by a poorer quality of relationship with significant others compared to individuals who are securely attached. Hence this study, in terms of attachment style, will only be looking at whether the individual is 'securely attached' in a specific relationship or 'insecurely attached'.

3.2 HYPOTHESES AND RESEARCH QUESTIONS

Specific research questions and hypotheses were developed for each of the types of recreational technology that is being considered in this project. The various question references such as Q2, Q25, QA, and QD refer to the field questionnaire as presented in Appendix 6. The research questions and hypotheses are listed below:

3.2.1 Home Entertainment Systems

- R_1: How much is invested in the technology that comprises the HES in terms of the number of components that it consists of?
- R_2: Is there a relationship between how much is invested in the HES technology, and attachment?
- R_3: What is the frequency (n; %) of most common use of the HES out of a possible 5 options?
- R_4: What is the average (mean) amount of time (hours) spent using the HES in a week?
- R_5: Is there a relationship between time spent using the HES and attachment?
- R_6: Are attitudes to HESs generally positive (n; %), or negative (n; %)?
- R_7: Is there a relationship between attitude towards the HES and attachment?

- H_1: Greater technological investment in HESs (Q2) correlates with an insecure attachment style (QA, QB, QC and QD).
- H_2: Time spent using HESs (Q3) correlates with attachment style (QA, QB, QC and QD).
- H_3: There is a significant relationship between the attitude towards HES attributes (Q6) and attachment avoidance (QA, QB, QC and QD).
- H_4: There is a significant relationship between the attitude towards HES attributes (Q6) and attachment-anxiety (QA, QB, QC and QD).

3.2.2 Personal Computer and Personal Digital Assistants (PDAs)

- R_8: How much is invested in the PC technology in terms of the number of components it consists of?
- R_8: Is there a relationship between how much is invested in the PC in terms of the number of components, and attachment?
- R_{10}: What is the frequency (n; %) of most common use of the PC (Q11) out of a possible 5 options?
- R_{11}: What is the average (mean) amount of time (hours) spent using the PC in a week?
- R_{12}: Is there a relationship between time spent using the PC and attachment?
- R_{13}: Are attitudes to PCs generally positive (n; %), or negative (n; %)?
- R_{14}: Is there a relationship between the attitude towards PCs and attachment?

- H_5: Greater technological investment in PCs (Q10) correlates with an insecure attachment style (QA, QB, QC and QD).
- H_6: Time spent using PCs (Q12) correlates with attachment style (QA, QB, QC and QD).
- H_7: There is a significant relationship between the attitude towards PC attributes (Q14) and attachment-avoidance (QA, QB, QC and QD).
- H_8: There is a significant relationship between the attitude towards PC attributes (Q14) and attachment-anxiety (QA, QB, QC and QD).

3.2.3 Cell phones

- R_{15}: How much technology is invested in the cell phone in terms of the number of functions that it has?
- R_{16}: Is there a relationship between how much technology is invested in the cell phone and attachment?
- R_{17}: What is the frequency (n; %) of most common use of the Cell phone (Q22) out of a possible 5 options?
- R_{18}: What is the average (mean) amount of time (minutes) spent using the cell phone in a day?
- R_{19}: Is there a relationship between time spent using the cell phone and attachment?
- R_{20}: Are attitudes to Cell phones generally positive (n; %) or negative (n; %)?
- R_{21}: Is there a relationship between attitudes to the cell phone and attachment?

- H_9: Greater technological investment in Cell phones (Q21) correlates with an insecure attachment style (QA, QB, QC and QD).
- H_{10}: Time spent using Cell phones (Q23) correlates with attachment style (QA, QB, QC and QD).
- H_{11}: There is a significant relationship between the attitude towards Cell phone attributes (Q25) and attachment-avoidance (QA, QB, QC and QD).
- H_{12}: There is a significant relationship between the attitude towards Cell phone attributes (Q25) and attachment-anxiety (QA, QB, QC and QD).

Thus all three types of technology will be looked at in more or less the same way and will be correlated and regressed onto the attachment style in order to determine whether relationships exist between them.

Specific research questions and hypotheses were developed for each of the categories of 'significant other' that is being considered in this project.

3.2.4 Attachment styles

- H_{13}: Insecurely attached individuals use recreational technology significantly more that securely attached individuals.
- H_{14}: A significant relationship exists between attitudes toward recreational technology and attachment style.

3.3 MEASUREMENT INSTRUMENTS

It was decided that a combined questionnaire consisting of three main sections would be used in order to capture the data for the study.

3.3.1 Biographical questions

The first section consists of a Biographical Questionnaire and captures the following main aspects:

a) Contact details so that any problems or uncertainties can be followed up where possible. Respondents were given the opportunity to enter an alias name in order to ensure anonymity. Respondents were also notified that no personal details would be revealed to any other parties other than the researcher and supervisor.
b) Gender, age, employment status and income.
c) Questions relating to close personal relationships such as marital status and number of friends.

3.3.2 Recreational Technology Use

The Recreational Technology Use Questionnaire, developed by the researcher was used to collect the relevant data for the technology component of the study (See Appendix 6).

The questionnaire covers four main areas with closed type questions and scales (see chapter 3, section 3.4). Some open-ended questions were also asked for each technology type in order to gather some qualitative information.

The questionnaire was designed in order to gather information about the various measurable aspects of recreational technology use, such as accessibility of the recreational technology within the home, the extent to which the technology has been invested in, in terms of components, and the most common uses and length of time of the technology use. An attitudinal scale was then developed for each technology type in order to determine what the individual's attitude toward the technology type was. Open-ended questions allowed the respondent to add additional information that could contribute toward the interpretation of the quantitative data.

The measurements for recreational technology relate to the four aspects of attitudes as described above (see section 3.2.1), and consist of the following:

a) Investment in objects of technology – a way of measuring 'vested interest'.
b) Most common use of the technology object – a way of measuring attitude once again. Does the individual use the technology for pleasure or for a means to an end? Affect is related to pleasure and a means to an end is related to the cognitive components of attitudes.

My reasoning behind this is that when faced with recreational technology use, we will more likely use our time seeking pleasure rather than achieving a means to an end. Thus I am hypothesizing that in terms of recreational technology use, affect is a better predictor of attitude than cognition. This will be measured by pre-defined categorical variables.

c) Time spent using technology – The time spent with someone or something is a good predictor of the individual's attitude toward the object, especially in a recreational situation where the individual is relatively free to choose how to spend his/her time. Thus my inference is, the more time spent with a person, or using an object (out of his/her own choice) the more positive the individual's attitude toward the person or object.

d) Positive and negative attitudes – getting straight to the point by asking individuals directly for their opinions on various aspects of technology use.

3.3.2.1 Validity and reliability

As this instrument had to be developed in order to capture the necessary data for the study, reliability and validity checks had to be done. An initial pilot test of the instrument was performed 15 individuals. Small problems were corrected and some items were either revised or removed. One or two items were added especially in the biographical section in order to improve the quality of information gathered. A few questions were moved so that the questionnaire flowed better as a whole.

It was decided to do the usual statistical checks for reliability and validity (frequencies, Cronbach Alpha's and factor analysis) using the final sample data due to the limited nature of the study and the generally large sample needed in order for these techniques to be relatively accurate.

The results are as follows:

For HES attitudinal attributes, internal reliability is moderate with a score of α=0.667 being achieved. However since the scale was not designed to measure a single underlying construct and as a factor analysis has revealed several constructs within the scale, this is not of concern. Internal reliability for the PC attitudinal scale is good with scores of 0.756 and 0.783 being achieved. Internal reliability for the Cell phone attitudinal scale is good with scores of 0.751 and 0.751 being achieved.

KMOs were completed for HES, PC and Cell phone attitudinal components of the questionnaire (Q6, Q14 and Q25 in Appendix 6) to determine whether these scales contained a sufficient number of items for making a factor analysis feasible. For the HES scale (Q6) a KMO of 0.662, for the PC scale (Q14) a KMO of 0.748 and for the Cell phone scale (Q25) a KMO of 0.694 indicate that there is no urgent need for additional items in order to adequately measure each underlying construct in order to ensure content validity. Bartlett's Test of Sphericity achieved a score of p=0.000 for all three scales (HES, PC, Cell phone) indicating that the factor model for each scale was appropriate. See Table 3.1 for the results.

Table 3.1 : Reliability and Validity Statistics for the HES, PC and Cell phone Scales (Q6, Q14, Q25)

	HES	PC	Cell phone
Cronbach's Alpha	0.667	0.756	0.751
No. of Items	21	24	20
KMO	0.662	0.748	0.694
Bartlett's Test of Sphericity	747.896	1151.230	1283.040
df	210	276	190
p	0.000*	0.000*	0.000*

* Significant to at least 1% level

3.3.3 Attachment Style

For the attachment style section, it was initially decided to use an attachment style scale called the Experiences in Close Relationships – Revised, developed by Fraley, Waller and Brennan (2000). However, upon further reading of attachment literature it was decided to look at attachment style in relation to all 'significant others' and not just in relation to the romantic partner. The major difference between the two is that the Attachment Style Questionnaire used in this study allows for determining the attachment style with mother, father, romantic partner and best friend, where as the ECR-R looks at attachment relationships only in relation to a general 'significant other'. It was therefore decided to use Chris Fraley's adaptation of the original ECR-R (Fraley, n.d.).

The adaptation encompasses most of the typical close relationships that the average individual would experience within a lifetime (see Appendix 6, section A to D). As most of us do not have the same quality of relationship with all other 'significant others', it was decided to use this adaptation of the ECR-R in order to allow for the complexity of individuals close relationships to be taken into account in this study.

Another reasoning for this was, for example, to allow us to see whether certain technologies had an impact on 'friendship attachment' as opposed to 'romantic partner attachment', and vice versa. This would make for a much more informative study if such differences were to be found.

The instrument measures two main constructs, namely Avoidance and Anxiety. From these two constructs a conceptual map, such as the one in Figure 1 below, can be used to determine what kind of attachment style the respondent has with his or her significant other. For example, an individual who has low avoidance scores as well as high anxiety scores in relation to his or her mother, would probably manifest a 'preoccupied' attachment style in relation to his or her mother characterised by needing to be in close contact with his or her mother (non-avoidant) and being anxious about the mother leaving him/her or not being available when needed. In contrast, an individual with both low anxiety as well as avoidance scores would most likely display a 'secure' attachment style characterized by being capable of close and meaningful contact with his/her significant other but also being free from fears of abandonment or over-protective behaviour by the significant other.

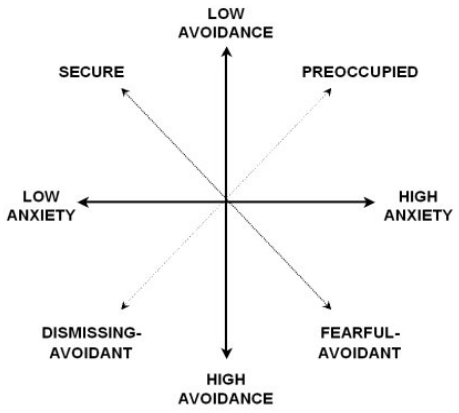

Figure 3.1: The two-dimensional model of individual differences in adult attachment *(Taken from Shaver and Fraley (1997)).*

For the items on pages 217 to 220, items 1 to 4 will obtain a low score if agreed to. Items 5 to 10 will obtain a low score if disagreed to.

3.3.3.1 Attachment Style of Significant Others

The measurements for attachment style are divided into four sections, each section having ten items. The four sections consist of the following:

a) 10 items relating to the relationship with the mother or mother-like figure.
b) 10 items relating to the relationship with the father or father-like figure.
c) 10 items relating to the relationship with the dating partner or marital partner.
d) 10 items relating to the relationship with the best friend.

The same ten items is used for all sections with only the target person being different and these items were derived from the original ECR-R developed by Fraley, Waller and Brennan (2000).

The ten items consist of four positive items and six negative items which were reverse scored. Each item is scored on a seven-point Likert type scale. A score of 1 to 3 indicates an 'insecure attachment style', 4 indicates neutral or 'do not know' and 5 to 7 indicates a 'secure attachment style'. Thus a total score out of 70 would be achieved for each section, and was divided by 10 to get a total attachment score out of 7.

This then would indicate the type of attachment for the specific 'significant other'.

The following items for each section measure attachment related anxiety: 5, 6, 7, 8, 9, and 10.

The following items measure attachment related avoidance: 1, 2, 3, and 4.

3.3.3.2 Validity and reliability

Reliability and validity research conducted on the ECR-R by Sibley and Liu (2003) indicates that the instrument provides a "reliable and replicable dual factor self-report measure of adult romantic attachment" (p.969). A principal axis factor analysis with varimax rotation indicated that there were two main underlying components accounting for 51% of the variation in scores obtained. This is consistent with the premise that the scale measures for avoidance and anxiety within relationships. Temporal stability was demonstrated by performing further repeated factor analyses on the longitudinal data. 86% of the variance in the avoidance subscale was shared across the six week time period.

On the anxiety subscale 86.5% of the variance was shared over the six week time period. High internal reliability scores of α=0.947 and α=0.934 were achieved.

Table 3.2 : Variance explained and Reliability and Validity Statistics for the Attachment Components of each significant other

	Variance explained in 2 factors	Cronbach α for anxiety component	Cronbach α for avoidance component
Mother attachment	56%	0.752	0.824
Father attachment	65%	0.848	0.870
Romantic Partner attachment	62%	0.816	0.883
Best Friend attachment	65%	0.850	0.867

Reliability and validity analyses by means of a principal axis factor analysis with varimax rotation, conducted for the modified version of the ECR-R used in this study, provided similar results as can be seen in Table 3.2 above. Temporal stability, however, was not measured due to the limited scope of the study.

Two main factors were consistently found for each 'significant other' (mother, father, romantic partner, and friend). These components were identified as 'anxiety' and 'avoidance' in all cases. The variance explained varies from 56% for mother attachment to 65% for father and best friend attachment.

Cronbach alphas were computed for each of the scales for each target person. These vary from a minimum of 0.752 for anxiety related to mother attachment to a maximum of 0.883 for avoidance related to romantic partner attachment. I therefore could confirm that the factor structure as predicted is accurate.

3.4 SAMPLE AND ETHICAL CONSIDERATIONS

It was decided to use high school students for the sample primarily due to their accessibility as well as the controlled conditions that the instrument would be conducted in. The sample was not intended to be a representative sample of the population, but merely a convenience sample. The sample of 172 students was taken from Primrose High School in Germiston, Gauteng Province, South Africa. The school is a technical high school and as such attracts more male students than female. Of the 172 questionnaires 168 could be used due to spoilt and unreturned questionnaires.

Written permission to conduct fieldwork was obtained from the principal.

Fieldwork was conducted in classrooms during Life skills or registration periods under the personal supervision of the principal or relevant teacher. The questionnaire contains a cover page explaining the principles of confidentiality and written voluntary consent, as well as the purpose of the study. It also contains the researcher's contact number in case of any enquiries. The teacher was instructed to explain the cover page and that no-one was to be forced to complete the questionnaire and that there would be no consequences of refusing to participate. After completion of the questionnaires they were handed back to the teachers and finally were in the possession of the principal. They were then collected by the researcher for data capturing purposes. Respondents' ages ranged from 16 (due to legal constraints) to 25. The socio-economic background of most students ranges from low income to medium income families.

The respondents were assured that their responses and personal details as well as individual responses would remain confidential and would only be reported on for the purposes of the study. All respondents had to sign a consent form stating that they were willing to participate and that they were 16 years and older.

3.5 SOURCES OF ERROR AND POTENTIAL PITFALLS

The attitudinal scales for the technology use questionnaire were pre-coded in such a way that some of the scale items were reversed. Care had to be taken to recode these items. To aid interpretation, Q6, Q14 and Q25 were transformed into dichotomous variables where '1' indicated disagreement, '2' indicated neutral and '3' indicated agreement.

Due to limitations during the design phase of the recreational technology use questionnaire as well as biographical questionnaire, certain cases where for example, hours of use of HESs for ***employed*** respondents needed to be determined, variables needed to be transformed so that only 'employed' respondents, excluding 'unemployed' respondents, would be taken into account in the analysis.

CHAPTER 4

DATA ANALYSIS

4.1 DATA CAPTURING, EDITING AND ANALYSIS

In this chapter the data is presented, firstly from simple frequency and descriptive statistical analysis methods in order to get an overview of the data collected.

A pilot study was conducted consisting of 15 respondents. This data was, however, excluded from the final sample. In total 172 respondents completed the questionnaire satisfactorily. Four completed questionnaires were rejected due to obviously erroneous and malevolent completion. Therefore the final sample came to n=168. As mentioned in Chapter 3, the respondents were taken from a technical high school in the south east of Johannesburg in South Africa. The socio-economic status of the majority of students consists of low household income to medium household income families.

All questionnaires were first coded by hand and checked for errors by the researcher. Verbatim statements / open-ended questions would be coded according to a thematic analysis whereby similar comments were given the same code and would be used to clarify and explain the findings in the closed questions as well as to add value to the overall study where applicable. Where possible the respondent was contacted telephonically to clarify any errors or problems within a questionnaire. If the error could not be clarified in this way it was treated as missing data.

The data was directly captured into a SPSS (Statistical Package for the Social Sciences) datasheet that was pre-prepared after coding was completed. The data was checked for errors by means of running frequencies and cross referencing any problems with the original paper questionnaire.

Cross tabulations and/or One Way ANOVAs were computed to determine whether there were any interesting relationships between demographic variables and those related to recreational technology.

Factor analysis was then done on the components (i.e. the specific items) of questions in sections A6, B14 and C25 in order to determine the underlying structure within the items relating to recreational technology; i.e. to get a sense of the attributes that were actually being measured. The factor analysis identified six variables relating to the participant's attitudes to recreational technology. The relationship between the set of six attitudes to technology variables and the eight attachment variables (described in section 3.3.3.2) was investigated by means of a canonical correlation analysis. To get more insight into specific relationships, regression analyses were also performed. A regression model was tested for each of the six *attitudes to technology* variables (as dependent variables) to see which attachment variables contributed significantly to explaining their variance. The independent variables were the mean scores for the Avoidance and Anxiety components on each of the four subsections (mother, father, partner and friend) of the Attachment Style Questionnaire. The process is described in more detail later (see 4.1.1 to 4.1.3). Results were then displayed and highlighted.

The data was captured into and analysed with SPSS version 12.

4.1.1 Factor analysis

A principle axis factor analysis with varimax rotation was performed on each of the three technology attitudinal scales (HES – Q6, PC – Q14, Cell phone – Q25) in order to determine how many underlying components exist. In each of the three sets of questions (Q6, Q14 and Q25) the distribution was best explained by two underlying concepts (factors) as the Eigenvalues in Table 7 Appendix 5 show. The results for each question are displayed in section 4.3.5 and Appendix 5 Tables 1 to 3.

New variables were then created for each of the three questions using the factor score coefficients of the salient factors and these new variables were tentatively named according to the constructs which the factors appear to represent, taking into consideration the loadings on the relevant variables. The names were based on an interpretation of the salient factor loadings. The full factor structures can be seen in Appendix 5 tables 4 to 6.

The variables derived from these factor analyses, through the use of the factor score coefficients, were now used as indicators of the specific attitudes to technology that are measured by this questionnaire. It is these variables that were to be compared to the attachment variables, to determine which underlying relationships, if any, exist. The final variables can be seen in section 4.7.2.

4.1.2 Canonical correlation analysis

A canonical correlation analysis was performed in order to determine if there is a relationship between the new technology variables (as seen in Appendix 5 Table 7), and the attachment variables for mother, father, partner and friend avoidance and anxiety. The regression analysis would then complement and enrich any findings from the canonical correlation analysis.

4.1.3 Regression analysis

In addition to the canonical correlations, one regression analysis model was performed for each of the six technology attitude variables (as dependent variables), to see which of the set of eight attachment variables (as independent variables entered in each model) contribute significantly to that technology attitude variable. Simply put, which attachment types have a significant relationship with this attitude to technology. A total of six regressions analyses were therefore run for each technology type (HES, PC, Cell phone).

4.2 DEMOGRAPHICS OF RESPONDENTS

In terms of gender, 66% of the respondents were male and 34% female. This substantial difference in gender stems from the fact that the sample was taken from a technical high school which attracts fewer females (Table 4.1).

Table 4.1 : Frequency distribution for gender

Gender	Frequency	Percent
Male	109	66.06
Female	56	33.94
Total	165	100.00

The average age of respondents was 17 years with a standard deviation of 1.18 years. The youngest respondents were 16 years old due to the sample criteria, and the eldest was 25. The details are displayed in Table 4.2.

Table 4.2 : Descriptive statistics for age

	Number	Minimum	Maximum	Mean	Standard Deviation
Age in years	163	16	25	17.23	1.18

Students were asked whether they were employed in any way as some scholars have part-time jobs from which to generate a small income. Only 13 (8%) of respondents were employed. Of those employed, three were waiters or waitresses and three were sales people. The majority of respondents who were employed earned an income up to R1000 (76%), where as only 9% earned R5000 or more. These respondents consisted primarily of sales people and a musician (Tables 4.3 to 4.5).

Table 4.3 : Descriptive statistics for employment status

	Frequency	Percent
Employed	13	7.98
Unemployed	150	92.02
Total	163	100

Table 4.4 : Descriptive statistics for employment type

Job Description	Frequency	Percent
Waiter / Waitress	3	25.0
Salesman / Lady	3	25.0
Other	6	50.0
Total	12	100.0

Table 4.5 : Frequency distribution of income category (of those employed)

Income Category	Frequency	Percent
R0 - R1000	16	76.2
R1001 – R20 000	5	23.8
Total	21	100.00

The majority (47%) of respondents were white. To be expected, most of the remainder (43%) were black. Most respondents spoke Afrikaans as their home language (33%) after which English speakers comprised 20%. Just over 40% of respondents spoke some or other African language. The most frequently spoken African language was Zulu (15%). The results are displayed below (Tables 4.6 to 4.7).

Table 4.6 : Frequency distribution of ethnicity group

Ethnic Group	Frequency	Percent
White	78	46.7
Black	71	42.5
Coloured	11	6.6
Asian	7	4.2
Total	167	100.00

Table 4.7 : Language

Language	Frequency	Percent
Afrikaans	54	32.9
English	32	19.5
Zulu	25	15.2
South Sotho	20	12.2
Other	9	5.5
Afrikaans and English	7	4.3
Tswana	7	4.3
Sepedi	6	3.7
Xhosa	4	2.4
Total	164	100.0

When looking at relationship demographics, 34% of respondents had an average household size of 4 individuals. The largest household size was 18 indicating the presence of disadvantaged individuals attending the school.

This is consistent with the socio-economic make-up of the area in which the school resides.

The vast majority of respondents (78%) had four or more friends. Almost 4% had no friends whatsoever. Although very few claimed to have more than 40 friends (that they see at least once a month) the claim that one individual made that he/she had 117 friends seems plausible given that two other individuals reported having 80 and 100 friends respectively. However it is suggested that the results be interpreted with caution as the mean gives a somewhat inaccurate idea of the average number of friends when the mode of 4 and median of 11 is taken into consideration. The results are clearly skewed. See Table 4.8 below for the results as well as Table 1 and 2 in Appendix 1.

Table 4.8 : Descriptive Statistics

	Number	Minimum	Maximum	Mean	Standard Deviation
Household size	163	1	18	4.83	1.91
Friends	158	0	117	13.46	19.84

Considering that all respondents were attending high school, it was interesting to note that 4% of respondents (n=6) were married of which one respondent had been married for 7 years. Of those who were not married, 54% were involved in an exclusive dating relationship. Of these 53% had been dating for at least one year, but few relationships lasted beyond three years. See the results below and the following page (Tables 4.9 to 4.10).

Table 4.9 : Frequency distribution of exclusive dating relationship status

Exclusive dating relationship	Frequency	Percent
Yes	86	53.75
No	74	46.25
Total	160	100.00

Table 4.10 : Frequency distribution of dating length in years (non-dating individuals excluded)

Years	Frequency	Percent
0	1	1.4
1	39	52.7
2	17	23.0
3	8	10.8
4	4	5.4
5	2	2.7
6 to 13 years	3	4.0
Total	74	100.00

4.3 RECREATIONAL TECHNOLOGY USE – HOME ENTERTAINMENT SYSTEMS

In this section the results of the questions relating to Home Entertainment Systems (HES) are displayed.

4.3.1 General Results

When asked whether the respondent had access to a HES at home, not surprisingly, 96% of respondents said "yes". When asked what the HES consisted of in terms of components, interestingly 94% of respondents that have access to an HES also have a DVD player as part of the HES, as well as a surprising 30% having a Big Screen Television and / or Projector. This score may be an exaggeration owing to the definition of the term 'big screen' as some respondents may have attributed even a 54cm television as a big screen television. Therefore, the results should be interpreted with caution. The comprehensive results are displayed on the following page in Table 4.11 and in Appendix 2 (Table 1).

Table 4.11 : Frequency distribution of HES components

Components	Frequency	Percent
Television	160	100.00
DVD Player	151	94.38
Component Surround Sound	114	71.25
Video recorder / player	108	67.50
DSTV decoder	68	42.50
Monitor	62	38.75
MNet decoder	57	35.63
Big Screen TV / Projector	49	30.63
DVD recorder	47	29.38
Kinetic feedback devices	18	11.25

When asked what the primary use of the HES was in a recreational setting, 'Entertainment and recreation' came out as the most common reason for using their HES (77%). HES were only used for educational purposes by 11% of respondents.

The average number of hours per week that a HES was utilized by the sample with access to an HES was 30 hours with a standard deviation of 22.3 hours.

Statements were classified as positive if they were favourable towards the use of HESs and negative if they were in any way unfavourable to the use of HESs. When asked to rate 21 statements according to how much they agreed or disagreed with them, in order to determine whether respondents viewed the technology statement as positive or negative, just over half the statements were positive towards HESs. Twelve out of the 21 (57%) statements were rated in such a way as to indicate a positive attitude towards HESs in general. The results were interpreted by combining the two bottom scores of disagreement (1 and 2) into a single category and the top two scores for agreement (4 and 5) were combined into a single category.

Large differences between 'agreement' and 'disagreement' were highlighted. For the comprehensive results see Table 4.12.

Table 4.12 : Agreement versus disagreement of HES exploratory attributes

Statement	Bottom Box % (Disagreement)	Top Box % (Agreement)	Positive / Negative
1. HESs have improved my social life	21.56	41.32	P
2. HESs hamper my relationships with my partner	48.10	13.92	P
3. HESs are a waste of time in general	69.88	9.64	P
4. I will rather watch a movie than visit friends or family	57.23	15.06	N
5. I expect more from HES technology in terms of what I can do with it	14.37	53.89	N
6. I wish I could spend more time watching my HES	46.11	18.56	N
7. People around me complain about me using my HES all the time	65.45	20.00	P
8. At home I leave my HES on all the time	73.01	14.72	N
9. I enjoy TV programmes in general	12.12	60.00	P
10. I have a problem seeing sex on the HES	51.22	23.78	P
11. I have a problem seeing nudity on the HES	49.70	21.82	P
12. I sometimes do too little work because I am using my HES	38.32	41.32	N
13. I often think about using my HES at home when I am at friends, family, church, the movies or trying to sleep	58.68	19.76	N
14. I often have social gatherings around my HES for watching sport, movies and/or TV	28.92	47.59	P
15. I use my HES to help me sleep	67.07	18.56	N
16. I have a HES in my bedroom	46.11	50.30	P
17. Sex and / or nudity on the HES has improved my romantic relationship/s	63.47	16.77	N
18. Violence on TV is bad	42.51	26.35	P
19. Bad language on TV is good	53.89	17.37	N
20. HESs hamper my relationships with my friends	46.39	19.88	P
21. HESs hamper my relationships with my family	48.50	16.77	P

Interestingly, 41% of respondents felt that HESs have improved their social lives and 48% often have social gatherings around their HES. A robust 70% of respondents disagreed that HESs are a waste of time. Interestingly, although approximately 50% of respondents do not have a problem with viewing sex or nudity on the HES, more than 60% felt it had no positive effect on their romantic relationships. There seems to be no distinction made by respondents between sex and nudity as both had very similar ratings.

4.3.2 Relationship with demographic data

Cross tabulations and/or One Way ANOVAs were performed between demographic data and the attitude items (see Appendix 2). There was a statistically significant difference between males and females ($p=0.018$) with more males stating that HESs have improved their social lives. There was also a significant difference between males and females with regard to the viewing of sex ($p=0.001$) and nudity ($p=0.010$). Interestingly far fewer males (16%) agreed that they had seen sex and/or nudity on their HES as opposed to females (34%). However, males were far more likely to agree that sex and/or nudity on their HES has improved their romantic relationships (24%) when compared to females (3.6%). Males also viewed violence on their HES much more favourably (49%) than females (29%). A similar significant difference emerges for bad language content on the HES. A One Way ANOVA revealed that older respondents (age 18 and over) enjoyed TV programmes significantly more ($p=0.029$) than the younger (17 year old) respondents, but not more than the 16 year old respondents.

The 18 year and older group was significantly less (p=0.036) likely to admit that they had seen sex on the HES that the 16 year old group. Also, the 18 year and older group was significantly less likely to admit that they had seen nudity on the HES than both the 16 year old (p=0.01) and 17 year old group (p=0.008). The 18 year and older group was significantly more likely to admit that sex and nudity on the HES had improved their romantic relationships than the 16 year old group (p=0.008) and a similar picture was found comparing the 17 year old group (p=0.014) with the 16 year old group (see Tables 5 to 11 in Appendix 2).

When looking at ethnicity, White respondents were significantly more likely (p=0.003) to stay at home and watch a movie rather than visit friends or family when compared to Black respondents. Other race groups (excluding whites) were significantly more likely (p=0.009) to want to spend more time watching their HES than Black respondents. White respondents were significantly more likely (p=0.015) to agree that people around them complained about them watching their HESs all the time when compared to Black respondents. Black respondents were significantly more likely (p=0.015) to report that they had seen sex on the HES than White respondents. A similar relationship was found for seeing nudity on the HES, where Black respondents were significantly more likely (p=0.006) to admit that they had seen nudity on their HESs than Whites. White respondents were significantly more likely to admit (p=0.020) that they 'did too little work because they are watching their HES' than Black respondents. Other race groups were significantly more likely to agree that they think about using their HES while being with friends or family, at church or the movies or trying to sleep than both Whites (p=0.012) and Blacks (p=0.006).

White respondents were significantly more likely (p=0.003) to admit that sex and/or nudity on the HES had improved their romantic relationships than Black respondents. Other race groups were less likely to admit that 'bad language on the HES is good' than both Black respondents (p=0.005) and White respondents (p=0.024). Both White respondents (p=0.0001) and Other race groups (p=0.021) were more likely to admit that the HES hampered their relationships with their friends than Black respondents. White respondents were also significantly more likely to admit (p=0.021) that the HES hampered their relationships with their family than Black respondents). Black respondents also used their HES significantly more per week than both White (p=0.004) and Other (0.021) respondents (see Table 12 in Appendix 2).

4.3.3 One Way ANOVAs between HES and attachment variables

In order to determine whether investment in technology has a relationship with attachment, it was deemed necessary to do a One Way ANOVA between the number of HES components, time spent using the HES and the attachment variables. No significant relationships were found between the number of HES components, time spent using the HES and attachment variables (see Tables 13 and 14 in Appendix 2).

4.3.4 Open questions

Please note that these results were taken from verbatim statements and similar statements were categorized into a generic statement in order to aid data reduction and make frequency analysis possible and ultimately the interpretation of the results.

When respondents were asked to state their general comments in regards to HESs, 12.9% felt that HESs were good for educational purposes. The second highest statement was that HESs do affect social life (11.4%). Some of the effects mentioned were that explicit content had a negative effect on children as well as sometimes on intimate relationships. Sexual content was also seen by some respondents as a precursor to teenage pregnancy, promiscuous sex and the spread of sexually transmitted diseases. Sex on television was also however seen by some as educational which could lead to an improvement in intimate relationships. Comments were also made that HESs improved relationships by providing topics to talk about with family and friends. Please note that no distinction was made here between positive or negative effects on social life. Only the fact that an affect on social life was experienced is stated. The effect on children was also of concern to many respondents (10.34%). It is also noteworthy that the viewing of sex is of greater concern to most respondents (8.9%) when compared to nudity (4%), violence (3%) and bad language (3%). The results can be seen in Table 4.13 on the following page.

Table 4.13 : Frequency distribution of General HES comments

Comment	Frequency	Percent
Educational tool	26	12.87
Affects social life	23	11.39
Affects children	21	10.40
Enjoy it	19	9.41
Do not like the sex	18	8.91
Should be controlled	16	7.92
Does not affect social life	16	7.92
People tend to do what they see on TV	15	7.43
I personally do not have a problem with it	13	6.44
Do not like the nudity	8	3.96
Other	7	3.47
Waste of time	6	2.97
Do not like the violence	6	2.97
Do not like the bad language	6	2.97
Can lead to violence	2	0.99

When respondents were asked what they would do instead, in the absence of their HES, 47% said they would socialize with family and friends. Other popular activities which would replace watching the HES is doing sports, exercise and outdoor activities (33%) and studying or doing homework (26%). Interestingly, sleeping was the fourth most popular alternative with 21%. Please note that these results were taken from verbatim statements and similar statements were categorized in order to aid data analysis and ultimately the interpretation of the results. The results are shown in Appendix 2 (Tables 2 to 4).

When a distinction was made between watching movies at the cinema versus watching movies at home, 63% of respondents claimed that they would rather go out as apposed to 37% who would rather stay at home. See Table 4.14.

Table 4.14 : Frequency distribution of Going out to watch movies or staying at home to watch movies

Activity	Frequency	Percent
Go out	103	63.2
Stay at home	60	36.8
Total	163	100.0

The main reasons for staying at home were comfort (30%), cost (23%) and having more control over the movie and/or environment (21%) such as stopping the movie to go to the toilet or to get food and watching multiple movies. The main reasons for going out are because it is more sociable (49%) and because it is more interesting and fun (33%). Only 9% mention the bigger screen and/or louder volume in the theatre. The results can be seen below (Tables 4.15 and 4.16).

Table 4.15 : Frequency distribution of Reasons for staying home

Comment	Frequency	Percent
More comfortable at home	22	30.1
Cheaper to stay at home	17	23.3
Have more control over movie / environment at home	15	20.5
More sociable to stay home	7	9.6
Like to be alone at home	6	8.2
Safer to stay at home	4	5.5
Stay home - Other	2	2.7
Total	73	100

Table 4.16 : Frequency distribution of Reasons for going out

Comment	Frequency	Percent
More sociable to go out	57	48.7
Going out is special / interesting / fun	39	33.3
The screen is bigger / volume louder	11	9.4
Just to get out the house	7	6
Will not be disturbed / interrupted if I go out	3	2.6
Total	117	100

4.3.5 Factor analysis

A principle axis factor analysis with varimax rotation was performed on the HES attitudinal scale (Q6) in order to determine how many underlying components exist. The HES model was best explained using 2 underlying concepts / components when loadings of 0.5 and greater were taken into consideration. The results are displayed in Appendix 5 Table 1.

Factor score coefficients were subsequently calculated and these were used to create new variables out of each of the two salient HES factors and these new variables were tentatively renamed according to what they appear to represent, taking into consideration the loadings on the relevant variables. The results can be seen in Appendix 5 tables 4 to 6 and the two factors with components with loadings of 0.5 and more are displayed below in Table 4.17.

Table 4.17: Two main factors extracted for HES attitudinal scale with factor loadings of 0.5 and more

FACTOR 1: Item description	Factor loading
I wish I could spend more time watching my HES	0.513
At home I leave my HES on all the time	0.510
HESs hamper my relationships with my friends	0.608
HESs hamper my relationships with my family	0.604

FACTOR 2: Item description	Factor loading
I have seen sex on the TV	0.815
I have seen nudity on the TV	0.829
Violence on TV is bad	0.578

The factors with moderate to high loadings (as given in Table 4.17) were named by considering the item descriptions. The variables that were created and named accordingly for HESs are therefore as follows:

HES (Q6)

- HES: (Social replacement / intrusion)
- HES: (Explicit content)

These variables were then used in a canonical correlation and regression analysis in order to determine whether there is a significant relationship between them and attachment styles with significant others.

4.4 RECREATIONAL TECHNOLOGY USE – PERSONAL COMPUTER / LAPTOP

These results explore the prevalence, frequency, type and preferences of Personal Computer / Laptop use (hereafter referred to as PC) and attitudes towards the use of PCs.

4.4.1 General Results

Nearly two thirds (62.3%) of respondents have access to a PC at home. The average computer system consists mainly of a 15 to 17 inch monitor, wired mouse and keyboard (55.4%), CD writer (52.4%), DVD Rom (39.9%), printer (46.4%) and surround sound capability and speakers (39.9%).

Very few respondents had a large monitor (14.9%) or broadband Internet connections (16.1%), most likely due to the high cost of these components. Comprehensive results are displayed below (Table 4.18)

Table 4.18: Frequency distribution of "What does your personal computer / laptop consist of?"

Component	Frequency	Percent (per component)
15" / 17" Monitor, CPU Box, Keyboard, Mouse, Speakers, CD-Rom / Laptop	93	55.4
CD-Writer	88	52.4
Printer	78	46.4
DVD-Rom	67	39.9
Surround Sound capability and speakers	67	39.9
1 Gigabyte of RAM / memory or more	58	34.5
Graphics Accelerator card	58	34.5
DVD-Writer	54	32.1
Joysticks, game pads, steering wheels and / or other gaming input devices	51	30.4
Dial-up Modem Internet connection	46	27.4
Scanner	45	26.8
Wireless keyboard and / or mouse	37	22.0
ISDN / ADSL / Sentech broadband Internet connection	27	16.1
19" / 21" Monitor	25	14.9

The majority of respondents (54.5%) said that they used their PC at home for entertainment and recreational purposes. Educational use came in at third (16.3%) just short of work and business related uses (18.7%). It should be kept in mind that very few respondents work as they are students, therefore the result could be considered as quite high. See Table 4.19 for the results.

Table 4.19: Frequency distribution of "Primary use of PC?"

Activity	Frequency	Percent
Entertainment and Recreation	67	54.5
For work/business/economic activities	23	18.7
Education	20	16.3
Do not use PC / Laptop at home	9	7.3
Other	4	3.2
Total	123	100.0

On average four hours a week were spent using the PC at home for work, business and/or educational purposes. An average of 11 hours per week is spent using the PC for recreational purposes. In total an average of 15 hours a week are spent using the PC at home. For the results see Table 4.20 below.

Table 4.20 : Descriptive statistics for time spent using PC at home

Activity	Frequency	Minimum	Maximum	Mean
For work / business / economic / educational activities?	101	0	48	4
For recreation / leisure / social activities?	101	0	90	11
In total?	103	0	102	15

When respondents were asked what they would do in the absence of their PC, 17.6% said they would watch television or watch a movie on their HES. Socializing was a close second with 14.6% of respondents stating that they would spend more time with friends or family in the absence of their PC. Physical activities (11.1%) as well as reading (9%) received moderately high scores as replacement activities for the PC. Results can be seen in (Table 4.21).

Table 4.21 : Frequency distribution of alternate activities in the absence of the PC

Comment	Frequency	Percent
Watch TV / a video	35	28.0
Socialise	29	23.2
Go out	27	21.6
Do sport / Exercise	22	17.6
Read	18	14.4
Hobbies	12	9.6
Study	11	8.8
Sleep	11	8.8
Chores	8	6.4
Listen to music	7	5.6
Play computer games	4	3.2
Go to church	3	2.4
Engage in crime / illegal activities	3	2.4
Other	3	2.4

When respondents were asked about their opinions on PCs regarding various aspects of their use, strong opinions characterized almost all attributes. Some of the more interesting results such as strong disagreement that PCs improve respondents' social lives (40.6%) and strong agreement that respondents would rather speak to someone personally than send them an e-mail (56.3%) provides a paradoxical picture of attitudes towards PCs in general. The vast majority of respondents felt that sex and or nudity did not have a positive effect on the relationships with their partners (70.5%), family (87.9%) or friends (82.9%). Classifying the attributes into categories of negative versus positive attitudes towards each attribute, revealed that 42% of the 19 classifiable attributes were rated negatively and 58% were rated positively. See Table 4.22 for the full results.

Table 4.22 Agreement versus disagreement of PC exploratory attributes

Statement	Bottom Box % (Disagreement)	Top Box % (Agreement)	Positive / Negative
1. Personal Computers / Laptops have improved my social life	40.6	28.7	N
2. Personal Computers / Laptops hamper my relationship with my partner	61.3	9.9	P
3. Personal Computers / Laptops are a waste of time in general	66.9	13.4	P
4. I will rather speak to someone personally than send them an e-mail	17.6	56.3	P
5. I expect more from computer technology in terms of what I can do with it	18.3	52.1	N
6. I wish I could spend more time on my Personal Computer / Laptop	45.0	31.4	N
7. People around me complain about me using my Personal Computer / Laptop all the time	67.4	17.4	P
8. At home I leave my Personal Computer / Laptop on all the time	74.3	12.9	P
9. I enjoy PC games	13.5	69.5	P
10. I think the internet has too much rubbish on it	43.3	27.7	P
11. I have seen sex on the Internet	43.4	32.2	
12. I sometimes do too little work because I am using my PC	51.1	23.4	P
13. I often think about using my PC at home when I am at friends, family, church, the movies or trying to sleep	67.4	14.9	P
14. I have attempted to find a romantic partner on the internet via chat-rooms, blogs, e-mail or match-making services	78.6	12.1	N
15. I have had a successful romantic relationship due to using the internet, chat-rooms, blogs, email and/or match-making services	86.4	5.7	N
16. I have maintained a relationship (romantic and/or friendship) by using the internet, chat-rooms, blogs, e-mail and/or match-making services, for longer than 6 months	85.7	9.3	N
17. Sex and or nudity on the internet has improved my romantic relationship/s	79.4	7.1	N
18. I would rather spend time on my Personal Computer / Laptop than go out to see friends, family, partner	71.8	9.2	N
19. Personal Computers / Laptops hamper my relationships with my friends	60.3	10.6	P
20. Personal Computers / Laptops hamper my relationships with my family	63.8	11.3	P
21. I have seen nudity on the internet	39.0	48.2	
22. Nudity / sex on my computer has improved my relationship with my partner	70.5	16.5	
23. Nudity / sex has improved my relationship with my family	87.9	2.1	
24. Nudity / sex has improved my relationship with my friends	82.9	5.7	

Only 7% of respondents use a Portable Digital Assistant at home. Of the 11 respondents that use a PDA at home 45.5% use it primarily for entertainment purposes. Only two hours a week on average were spent using the PDA for work related activities (take into consideration that the sample consists of students) whereas 26 hours a week were spent on average using the PDA for recreational activities. Note however that the base is small and should be interpreted with caution. For the full results see below (Tables 4.23 and 4.24).

Table 4.23 : Frequency distribution of "Primary use of PDA"

Activity	Frequency	Percent
Entertainment & Recreation	5	45.5
Education	3	27.3
Social activities (such as email and chat-rooms)	2	18.2
For work/business/economic activities	1	9.1
Total	11	100

Table 4.24 : Descriptive statistics for time spent using the PDA in hours per week

Activity	Number	Minimum	Maximum	Mean
Hours-For work / business / economic/ educational activities?	8	0	10	2
Hours-For recreation / leisure / social activities?	8	0	72	26
In total?	8	1	72	25

4.4.2 Relationship with demographic data

It appears that males felt that PCs were more likely to have improved their social lives (33%) than females (20%). Males are more likely to state that that they wanted more in terms of what they could do with their PCs (60%) as apposed to females (38%).

Males also enjoyed PC games (77%) significantly more (p=0.017) than females (24%). Interestingly, as with HESs, males were significantly less likely (p=0.001) to state that they have seen sex on the Internet (24%) than females (49%). Also, males were significantly more likely (p=0.002) to state that sex and/or nudity on the Internet had improved their romantic relationships (11%) as well as friendships (9%; p=0.019 below as well as Tables 1 to 6 in Appendix 3.

When looking at race groups, there was also a significant difference amongst race groups (p=0.003) with White respondents agreeing most with the statement, "The Internet has too much rubbish on it". See the results in Table 7 in Appendix 3.

4.4.3 One Way ANOVAs between PC and attachment variables

In order to determine whether investment in the PC technology and time spent on the PC has a relationship with attachment, it was deemed necessary to do One Way ANOVA analyses between the number of PC components, hours of use, and the attachment variables. No significant relationships were found between the number of PC components, hours of use, and attachment variables (see Tables 8 and 9 in Appendix 3).

4.4.4 Open ended questions

When respondents were given an opportunity to give any general comments on violence, sex, nudity, pornography and language exposure from computer games, movies and Internet use in relation to their personal and social relationships, the major statement given was that they did not like this exposure in general (35.4%). Of the 99 respondents who answered the question, 29.3% stated that such content lead to immoral thoughts and/or behaviour. Twenty seven point three percent also stated that they were unconcerned by such content on their PCs. There was also a strong consensus that such content should be controlled for younger viewers (22.2%).

Of the 90 respondents who commented on e-mail, blogs, chat-rooms, Internet dating, match making services, PC- games and/or information in relation to their personal and social relationships, 22% stated that these helped to establish relationships. However 20% said that they did not like it. The main reasons for not liking these services and functions seems to be that chat-rooms and match making services are perceived to be for lonely, desperate or shy people (12.2%) and that it was not good to communicate with strangers (12.2%). The results are displayed in Tables 4.25 to 4.26.

Table 4.25 : Frequency distribution of opinions about violence, sex, nudity, pornography and language exposure from games, movies and / or Internet usage in relation to your personal and social relationships

Comment	Frequency	Percent
Do not like it / Find it offensive	35	35.4
Leads to immoral thoughts / behaviour	29	29.3
It is irrelevant / does not concern me	27	27.3
Should be controlled for younger viewers	22	22.2
Leads to incorrect thinking and motives	18	18.2
Educates you about life	12	12.1
Like it	11	11.1
Violence is OK	11	11.1
Other	8	8.1

Table 4.26 : Frequency distribution of opinions about e-mail, blogs, chat-rooms, Internet dating, match-making services, PC-games and/or information in relation to your personal and social relationships

Comment	Frequency	Percent
Helps to establish relationships	20	22.2
Bad / Do not like it	18	20.0
Good	17	18.9
For lonely / desperate / shy people	11	12.2
Not good to communicate with strangers	11	12.2
Allows for easy communication	8	8.9
Leads people to be dishonest about themselves	6	6.7
Other	6	6.7
Takes time away from your relationships	5	5.6

4.4.5 Factor analysis

A factor analysis was performed on the PC attitudinal scale (Q14) in order to determine how many underlying components exist. The PC model was best explained using 2 underlying concepts / components when loadings of 0.5 and greater were taken into consideration. The results are displayed in Appendix 5 Table 2.

Factor score coefficients were also calculated and these were used to also create new variables out of each of the two salient PC factors and these new variables were also tentatively renamed according to what they appear to represent, taking into consideration the loadings on the relevant variables. The results can be seen in Appendix 5 Table 5 and the two factors with components with loadings of 0.5 and more are displayed below in Table 4.27.

Table 4.27 : Two main factors extracted for PC attitudinal scale with factor loadings of 0.5 and more

FACTOR 1: Item description	Factor loading
I have attempted to find a romantic partner on the internet	0.540
I have had a successful romantic relationship due to using the internet	0.633
I have maintained a relationship (romantic and/or friendship) by using the internet	0.626
Sex and or nudity on the internet has improved my romantic relationship/s	0.648
Personal Computers / Laptops hamper my relationships with my friends	0.526
Nudity / sex on my computer has improved my relationship with my partner	0.560
Nudity / sex has improved my relationship with my family	0.711
Nudity / sex has improved my relationship with my friends	0.699

FACTOR 2: Item description	Factor loading
Personal Computers / Laptops are a waste of time in general	-0.558
I wish I could spend more time on my Personal Computer / Laptop	0.658
I enjoy PC games	0.550
I often think about using my PC at home when I am at friends, family, church, the movies or trying to sleep	0.548
I would rather spend time on my Personal Computer / Laptop than go out to see friends, family, partner	0.559

The factors with moderate to high loadings as given in Table 4.27 above were named by considering their item descriptions. The variables that were created and named accordingly for PCs are as follows:

PC (Q14)

- PC: (Social / romantic / sexual improvement)
- PC: (Motivation to spend time using PC)

These variables were subsequently used in a canonical correlation and regression analysis in order to determine whether there is a significant relationship between them and attachment styles with significant others.

4.5 RECREATIONAL TECHNOLOGY USE – CELL PHONE USE AND SOCIAL IMPACT

These results explore the prevalence, frequency, type and preferences of Cell phone use and attitudes towards the use of cell phones.

4.5.1 General results

The vast majority of respondents (94%) had access to a cell phone. When asked to indicate what functions their cell phones had, the SMS (91.7%), Memo / calendar and/or reminder functions (81.5%) and MMS function (78%) were the most pervasive, which is to be expected as most, if not all cell phones on the market have these functions.

Functions such as video call functionality and television were least pervasive with 19% and 12% of respondents respectively indicating that their cell phones possessed this functionality.

This is to be expected as these functions are relatively new to the market and come at a high cost which places them out of reach of the majority of consumers at present, especially these as they are still school goers. Table 4.28 presents the results.

Table 4.28: Frequency distribution of "Which of the following functions does your cell phone have?"

Functions	Frequency	Percent (per component)
SMS (Short message service) capability	154	91.7
Memo / calendar / reminder functions	137	81.5
MMS (Media message service) capability	131	78.0
WAP internet connection	130	77.4
GPRS internet connection	125	74.4
Polyphonic ring tones	125	74.4
Camera	118	70.2
Video playback	101	60.1
True-tone ring tones	98	58.3
Video recording	91	54.2
Data transfer capability	77	45.8
MP3 / WMA player	76	45.2
Radio	64	38.1
PC-Game functionality	57	33.9
3G services and internet connection	44	26.2
Hard-drive / upgradeable memory (RAM)	33	19.6
Video call functionality	32	19.0
Television	20	11.9

The respondents were then asked to mark off on a predefined list what their most common use of the cell phone was. Of the 157 respondents that answered the question, 68% stated that having access to friends and family was the most common use of their phones. Using their phones for entertainment was only rated by 14% as the primary use of their phones. Respondents were asked to indicate how many minutes a day on average they used their cell phones. After removing outliers, the mean number of minutes per day of cell phone use came to 82 minutes. Table 4.29 and 4.30 presents the results.

Table 4.29 : Frequency distribution of Primary use of cell phone

Activity	Frequency	Percent
Social and family related accessibility	107	68.2
Entertainment and leisure	22	14.0
Work/business/economic activities	13	8.3
Safety and emergency assistance	13	8.3
Internet and data connectivity	2	1.3
Total	157	100.0

Table 4.30 : Descriptive Statistics of cell phone use in minutes per day

	Number	Minimum	Maximum	Mean
How many minutes a day?	115	0	300	82

Respondents were asked to indicate their level of agreement or disagreement with a number of attributes pertaining to cell phone use. This was in order to determine attitudes to various aspects of cell phone use and ultimately also to determine whether cell phones are in general perceived positively or negatively. The respondents were asked to rate the attributes on a five point Likert scale ranging from "Strongly disagree" to "Strongly agree". For the purposes of analysis, the two bottom scores (1 and 2) were combined to indicate disagreement and the two top scores (4 and 5) were combined to indicate agreement. Generally, attitudes towards cell phones are very favourable, with 11 out of the 15 attributes (73.4%) being positive towards cell phones. Seventy seven point two percent of respondents felt that cell phones have helped improve their social lives. Paradoxically 77% of respondents would however rather go out with friends, family or partners than spend time on their phones. It may be that the Cell phone is seen as an extension to their social lives whereby being with friends and family is best but having contact with them via the phone is the next best thing. Only 12% of respondents slept with their phones off where as 63% of respondents would leave their phones on during class, meetings, church or interviews.

4.5.2 Relationship with demographic data

There was a significant gender difference (p=0.016) with males being more likely to sleep with their phones off (17%) than females (2%). Males (45%) differed significantly from females (p=0.013) in their response (and disagreed far more) to the statement that "Cell phones hamper my relationships with my family" when compared to females (20%). A significant difference was once again found between genders when asked about the viewing of sex (p=0.002) and nudity (p=0.005) on their cell phones. Males were far more likely to have viewed sex (57%) and nudity (48%) on their phones than females with only 20% having seen sex and 24% having seen nudity. With regard to whether viewing sex and/or nudity on their phones improved their relationships with their friends, partners and family, females were significantly more likely to disagree with all three cases than males, however this result should be interpreted with caution due to the low number of cases for some options for females. See the results provided in Table 4.31 as well as Tables 1 to 7 in Appendix 4.

Table 4.31 : Agreement versus disagreement of cell phone exploratory attributes

Statement	Bottom Box % (Disagreement)	Top Box % (Agreement)	Positive / Negative
1.Cell-phones have improved my social life	8.2	77.2	P
2. Cell-phones are an invasion of privacy	39.6	34.0	P
3. Cell-phone calls are expensive	14.7	61.5	N
4. Cell-phones often disrupt my life	53.2	20.9	P
5. I expect more from cellular technology in terms of functionality	23.6	44.6	N
6. I spend too much time on my cell-phone	35.7	29.3	P
7. People around me complain about me using my phone	53.5	27.7	P
8. I leave my phone ON in class, meetings, the movies, church, or interviews in case someone needs to get hold of me	19.0	63.3	P
9. I will rather visit friends or family than phone them on their cell-phones	27.4	44.6	N
10. I sleep with my phone OFF	80.0	11.6	P
11. Cell-phones hamper my relationship with my partner	38.5	37.2	P
12. Cell-phones hamper my relationships with my friends	39.1	35.3	P
13. Cell-phones hamper my relationships with my family	37.2	35.3	P
14. I would rather spend time on my cell-phone than go out to see friends, family, partner	77.1	5.1	N
15. I sometimes do too little work because I am using my cell-phone	57.3	19.1	P
16. I have seen sex on my cell-phone	50.0	37.8	
17. I have seen nudity on my cell-phone	44.2	39.7	
18. Nudity and / or sex on my cell-phone has improved my relationship with my partner	72.4	15.4	
19. Nudity and / or sex on my cell-phone has improved my relationship with my friends	81.4	8.3	
20. Nudity and / or sex on my cell-phone has improved my relationship with my family	83.3	8.3	

Significant race group differences were found (p=0.001) when the cost of cell phone calls were rated. Interestingly, only 48% of Black respondents felt that cell phone calls were expensive as apposed to 72% of Whites and 65% of the other race groups. White (59%) and other race group respondents (57%) would much rather visit their friends and family than call them on their cell phones than Black (27%) respondents. Interestingly, Black respondents (53%) were significantly more likely (p=0.002) to agree with the statement, "Cell phones hamper my relationship with my partner" than White (27%) or other race group respondents (24%).

The same applies for Black respondents when asked to rate whether cell phones hamper their relationships with their family or friends. The results are displayed in Tables 8 to 12 in Appendix 4.

4.5.3 One Way ANOVAs between Cell phone and attachment variables

In order to determine whether investment in technology has a relationship with attachment, it was deemed necessary to do One Way ANOVA analyses between the number of Cell phone components, the time spent using the Cell phone and the attachment variables. No significant relationships were found between the number of Cell phone components, minutes of use, and attachment variables (see Tables 13 and 14 in Appendix 4).

4.5.4 Open questions

Respondents were then asked to indicate what they would do with their time in the hypothetical absence of their cell phones. The rationale behind this question was to establish what activities cell phone use may be replacing. Twenty six percent (26%) stated that they would socialize and/or speak to people directly in the absence of their phones. Of the 123 respondents who answered the question, 20% would replace the time by watching their HES. See the results in Table 4.32 below.

Table 4.32 : Frequency distribution of alternative activities in the absence of the cell phone

Activity	Frequency	Percent
Socialise / Speak to people directly	32	26.0
Watch TV / Movies	24	19.5
Sleep	14	11.4
Nothing	14	11.4
Use other means of communicating	13	10.6
Read	12	9.8
Sport / Exercise	10	8.1
Study	10	8.1
Hobbies	9	7.3
Listen to music	8	6.5
Use the PC	6	4.9
Other	6	4.9
Go out	5	4.1
Eat	4	3.3
Get another phone	2	1.6
Chores	2	1.6
Community service	1	0.8
Work	1	0.8

Respondents were asked to provide general comments about cell phones and / or relationships. Of the 98 respondents who answered the question, 44% stated that it 'helps keep you in touch with family and friends'.

Fourteen percent said that it was 'good for emergencies' and 13 percent stated that it improves or helps build relationships. See Table 4.33 below for the results.

Table 4.33 : Frequency distribution of general comments about cell phones and / or relationships

Comment	Frequency	Percent
Helps keep you in touch with family and friends	43	43.9
Good for emergencies	14	14.3
Improves / builds relationships	13	13.3
Can be addictive / destructive	11	11.2
Other	10	10.2
Love my phone	10	10.2
Sex and nudity should not be allowed	8	8.2
Cell phones are expensive	5	5.1
Improve our lives	5	5.1
Fun	3	3.1
Internet access is too slow	1	1.0

4.5.5 Factor analysis

A factor analysis was performed on the Cell phone attitudinal scale (Q25) in order to determine how many underlying components exist. The Cell phone model was also best explained in terms of two underlying concepts / components when loadings of 0.5 and greater were taken into consideration. The results are displayed in Appendix 5 Table 3. Factor score coefficients were once again calculated and these were used to once again create new variables out of each of the two salient Cell phone factors and these new variables were also tentatively renamed according to what they appear to represent. The results can be seen in Appendix 5 tables 6 and the two factors with components with loadings of 0.5 and more are displayed in Tables 4.34.

Table 4.34: Two main factors extracted for Cell phone attitudinal scale with factor loadings of 0.5 and more

FACTOR 1: Item description	Factor loading
I have seen sex on my cell phone	0.703
I have seen nudity on my cell phone	0.682
Nudity and / or sex on my cell phone has improved my relationship with my partner	0.850
Nudity and / or sex on my cell phone has improved my relationship with my friends	0.855
Nudity and / or sex on my cell phone has improved my relationship with my family	0.742

FACTOR 2: Item description	Factor loading
Cell phones hamper my relationship with my partner	0.781
Cell phones hamper my relationships with my friends	0.774
Cell phones hamper my relationships with my family	0.815

The items above with moderate to high loadings were named considering their item descriptions and the variables that were created and named accordingly for PCs are as follows:

Cell phone (Q25)

- CELL: (Explicit content and relationships)
- CELL: (Social intrusion on relationships)

These variables were then used in a canonical correlation and regression analysis (see section 4.1.2).

4.6 ATTACHMENT STYLES – INTRODUCTION AND RESULTS

4.6.1 Introduction

In these results the styles of attachment towards the significant others of the participants are explored, which in the case of this questionnaire specifically refer to mother, father, partners and friends. This data will ultimately be used to determine whether a relationship exists between recreational technology use and attachment styles. The instrument used was designed by Chris R. Fraley. It will be used for determining the attachment style with mother, father, romantic partner and best friend (see 3.3.3).

The mean scores of both attachment and anxiety will be used as the independent variables. A high score on the anxiety and avoidance scales will imply a high level of anxiety or avoidance respectively for the relevant significant other (see page 217). The new variables created from the factor analyses from Q6, Q14 and Q25 in the recreational technology questionnaire will be used as the dependent variables for regression analyses in order to determine whether a relationship exists or not between recreational technology use and attachment anxiety and avoidance.

4.6.2 Data analysis

When looking at the results of the descriptive analysis of the mean attachment scores, specifically skewness and the kurtosis, it will be noticed that the data is not normally distributed; especially 'Mother anxiety' (positively skewed at 1.163) and 'Father Anxiety' (positively skewed at 0.684). The kurtosis values below 0 show that the data consists of mostly extreme scores for most scales except 'Mother anxiety' which has a larger number of ratings grouping closely to the mean (kurtosis statistic of 0.280).

Looking at the norm scores for the ECR-R taken from an online survey with 78% of the respondents being female and the average age being 24, it can be seen that the respondents' scores for this study, on average, are well within the norm except for father avoidance as discussed above. See Table 4.35 below.

Table 4.35 : Overall norm scores obtained by the online version of the ECR-R with a sample of 22 000

Number	Avoidance	Anxiety
Overall (full sample; n=22 000)	M = 2.93, *SD* = 1.18	M = 3.64, *SD* = 1.33

When comparing the overall mean scores for each category of 'significant other' (see Table 4.36) with each other, it can be noted that respondents are generally more avoidant of their father-like figures (M = 3.7) than of their mothers (M = 2.8), partners (M = 2.9) and friends (M = 2.8). This score was significantly greater than the norm score of M=2.93 (see Table 4.37).

Mother related anxiety was also lowest (M = 2.3) and when combined with the avoidance score (M = 2.8), it appears that in general respondents have quite a secure relationship with their mothers or mother-like figures. Although the mean score for 'Father Avoidance' is the highest (M = 3.7), when taken in conjunction with the 'Father Anxiety' score (M = 2.8), then respondents generally have a secure relationship with their fathers, although it is the least secure type of relationship when compared with the other relationship categories. It is interesting to note that the anxiety mean score (M = 3.3) for 'Partner anxiety' is the highest when compared to all other relationship mean anxiety scores. Most of the differences between means for avoidance and anxiety were significantly different from the norms scores given in Table 4.35 when a single group t-test was performed. Respondents are significantly more avoidant of their fathers in general but are significantly less anxious in their relationships with all significant others. The most likely explanation for the avoidance score deviation is that due to the high incidence of divorce amongst students at the school, the attachment relationships of the majority of the students does not fall within the norm with the father figure. No suitable explanation is available for the lower than normal anxiety scores. The results are displayed below in Table 4.36 and 4.37a and 4.37b.

Table 4.36: Descriptive Statistics for Avoidance and Anxiety of significant others

Significant Other	Number	Minimum	Maximum	Mean	Standard Deviation	Skewness	Kurtosis
Mother Avoidance	158	1	6	2.8	1.27	0.260	-0.766
Mother Anxiety	156	1	7	2.3	1.68	1.163	0.280
Father Avoidance	144	1	7	3.7	1.55	0.300	-0.155
Father Anxiety	144	1	7	2.8	1.86	0.684	-0.685
Partner Avoidance	140	1	7	2.9	1.29	0.358	-0.207
Partner Anxiety	141	1	7	3.3	1.67	0.263	-0.735
Friend Avoidance	147	1	7	2.8	1.28	0.279	-0.533
Friend Anxiety	143	1	7	3.0	1.59	0.521	-0.302

Table 4.37a One-Sample t-Test comparing avoidance means with norm score

	Test Value = 2.93				
Target person	t	df	p (2-tailed)	Mean Difference	Mean
Mother Avoidance	-0.811	157	0.419	-0.082	2.848
Father Avoidance	5.632	143	*0.000	0.725	3.655
Partner Avoidance	-0.645	139	0.520	-0.070	2.860
Friend Avoidance	-1.036	146	0.302	-0.109	2.821

* Statistically significant at the 5% level

Table 4.37b One-Sample t-Test comparing anxiety means with norm score

	Test Value = 3.64				
Target person	t	df	p. (2-tailed)	Mean Difference	Mean
Mother Anxiety	-9.776	155	*0.000	-1.315	2.325
Father Anxiety	-5.493	143	*0.000	-0.850	2.790
Partner Anxiety	-2.411	140	*0.017	-0.339	3.301
Friend Anxiety	-5.161	142	*0.000	-0.685	2.955

* Statistically significant at the 5% level

4.7 THE RELATIONSHIP BETWEEN ATTACHMENT STYLES AND RECREATIONAL TECHNOLOGY

It was decided to conduct a canonical correlation analysis between the set of technology attitude variables as determined by the factor analysis in order to determine whether a relationship exists between the two sets of variables; i.e. the attachment and new technology attitude variables as extracted by the factor analysis (see section 4.7.1 and Table 4.42).

4.7.1 Canonical correlation analysis

Preliminary analysis indicated that there was a significant relationship between the two sets of variables (p=0.003). The 6 variables extracted from the factor analysis can account for 15.8% of the variance in attachment. The 8 attachment variables can account for 17.7% of the variance in technology use. This seems to imply that the relationship between the two sets of variables is not particularly great. See Table 4.38 below for the results.

Table 4.38 Canonical analysis summary between technology variables (left) and attachment variables (right)

n=81 p=0.00303*	Left set (technology variables)	Right set (attachment variables)
Number of variables	6	8
Total redundancy	17.63%	15.46%
Variables:		
1	HES: (Social replacement/intrusion)	Mother avoidance
2	HES: (Explicit content)	Mother anxiety
3	PC: (Social/romantic/sexual improvement)	Father avoidance
4	PC: (Motivation to spend time using PC)	Father anxiety
5	Cell: (Explicit content and relationships)	Partner avoidance
6	Cell: (Social intrusion on relationships)	Partner anxiety
7		Friend avoidance
8		Friend anxiety

* Significant at the 1% level

The solution with no roots removed is significant. This implies that only the first root needs to be considered. See Table 4.39 below.

Table 4.39 Chi-square tests with Successive roots removed for technology and attachment

Root removed?	Canonical R	Canonical R-square	Chi-square	df	p
0	0.588	0.345	79.282	48	0.003
1	0.473	0.224	48.559	35	0.064
2	0.445	0.198	30.196	24	0.178
3	0.309	0.096	14.186	15	0.511
4	0.271	0.073	6.894	8	0.548
5	0.137	0.019	1.368	3	0.713

From Table 4.40 below it can be seen in the 'Root 1' column that the greatest loadings are on the HES: (Social replacement/intrusion), PC: (Social/romantic/sexual improvement), and Cell: (Explicit content and relationships) technology variables. These three variables contribute the greatest amount of variance within the attachment variables.

Table 4.40 Factor structure and loadings of left set (technology) variables

Root variable	Root 1	Root 2	Root 3	Root 4
HES: (Social replacement/intrusion)	-0.605851	0.487919	0.25155	0.31712
HES: (Explicit content)	0.280207	0.788598	0.23033	-0.1853
PC: (Social/romantic/sexual improvement)	-0.520521	-0.016796	-0.74850	-0.1048
PC: (Motivation to spend time using PC)	0.024086	0.235088	-0.03110	-0.1191
Cell: (Explicit content and relationships)	-0.784250	-0.130108	-0.29230	-0.0401
Cell: (Social intrusion on relationships)	-0.057006	0.509358	-285657	0.78327

The first root explains about 22% of the variance of the factor items. Given the attachment items, you can explain about 7.7% of the variance in the factor items. See Table 4.41.

Table 4.41 Variance extracted for the left set (technology) variables

Root factor	Variance extracted	Redundancy
Root 1	0.223	0.077
Root 2	0.199	0.044
Root 3	0.141	0.028
Root 4	0.129	0.012
Root 5	0.163	0.012
Root 6	0.146	0.003

The loadings on the Root 1 attachment variables indicate that Mother anxiety (-0.83), Father anxiety (-0.59) and Partner anxiety (-0.61) are the most important variables when considering the factors in Table 4.42.

Table 4.42 Factor structure and loadings of right set (attachment) variables

Root variable	Root 1	Root 2	Root 3	Root 4
Mother avoidance	-0.241	0.022	0.340	0.451
Mother anxiety	-0.830	0.138	-0.212	0.074
Father avoidance	-0.151	0.253	0.472	0.518
Father anxiety	-0.590	0.119	-0.050	0.023
Partner avoidance	-0.477	-0.581	0.363	-0.238
Partner anxiety	-0.608	0.112	0.050	0.323
Friend avoidance	-0.354	-0.551	0.095	0.440
Friend anxiety	-0.417	-0.321	-0.471	0.637

The first canonical root explains about 25,2% of the variance in the attachment scores. Given the variables in the factor items, you can account for about 8,7% of the variance in the attachment variables. See Table 4.43 below.

Table 4.43 Variance extracted for right set (attachment) variables

Root variable	Variance extracted	Redundancy
Root 1	0.252	0.087
Root 2	0.107	0.024
Root 3	0.094	0.019
Root 4	0.155	0.015
Root 5	0.113	0.008
Root 6	0.108	0.002

The relationship between the two sets of variables is significant, however the effect size is not particularly large (there is not a large percentage of the variance in one set explained by the other set). There is some relationship between attachment-anxiety items and subjects' attitude toward social replacement as well as explicit content with regard to technology usage. Section 4.7.2 will describe the details of the regression analysis and shed some further light on these results.

4.7.2 Regression analyses

In order to elucidate the relationships between the attachment variables and the variables indicating attitudes to recreational technology as identified through the factor analyses, a number of regression models were constructed. In each model one of the six technology attitude variables was used as a dependent variable, while the set of eight attachment variables were used as independent variables. The rationale behind this was to determine how the attachment variables are related to each type of attitude to technology variable and, more specifically, to determine which specific independent variables are of importance in each case. The six technology variables are given in Table 4.44 below.

Table 4.44 Dependent new variables used in regression and canonical correlation analysis

Dependent variables
HES: (Social replacement / intrusion)
HES: (Explicit content)
PC: (Social/romantic/sexual improvement)
PC: (Motivation to spend time using PC)
Cell: (Explicit content and relationships)
Cell: (Social intrusion on relationships)

The presence of one to two outliers was noted on mother anxiety, Cell (Social intrusion on relationships), PC (High motivation to spend time using PC) and PC (Social/romantic/sexual improvement) on the standardized residual plot and it was deemed unnecessary to take any action. No other outliers were observable. Pearson Correlations between anxiety and avoidance for target persons (mother, father, partner and friend) and the new technology variables were performed in order to determine whether there was a relationship between them. See Table 4.45 below.

Table 4.45 Pearson correlations between new technology variables and attachment variables

		Mother Avoidance	Mother Anxiety	Father Avoidance	Father Anxiety	Partner Avoidance	Partner Anxiety	Friend Avoidance	Friend Anxiety
HES (Social replacement / intrusion)	Pearson Correlation	0.126	0.264	0.113	0.169	0.071	0.300	-0.046	0.103
	Sig. (2-tailed)	0.140	**0.002	0.207	0.058	0.429	**0.001	0.602	0.248
	N	139	137	126	126	126	126	130	128
HES (Explicit content)	Pearson Correlation	-0.130	-0.174	0.068	0.002	-0.149	-0.112	-0.230	-0.314
	Sig. (2-tailed)	0.126	*0.043	0.448	0.979	0.095	0.212	**0.008	**0.000
	N	139	137	126	126	126	126	130	128
PC (Social / romantic / sexual improvement)	Pearson Correlation	-0.019	0.225	-0.095	0.194	-0.033	0.106	0.077	0.239
	Sig. (2-tailed)	0.835	*0.014	0.320	*0.040	0.736	0.269	0.416	*0.012
	N	121	119	112	112	109	110	113	109
PC (High motivation to spend time using PC)	Pearson Correlation	-0.076	-0.107	-0.038	-0.015	0.038	0.140	-0.032	0.088
	Sig. (2-tailed)	0.406	0.247	0.687	0.878	0.698	0.144	0.735	0.360
	N	121	119	112	112	109	110	113	109
CELL (Explicit content and relationships)	Pearson Correlation	0.195	0.263	0.002	0.204	0.065	0.180	0.109	0.240
	Sig. (2-tailed)	*0.022	**0.002	0.985	*0.019	0.470	*0.043	0.216	**0.007
	N	139	137	131	131	127	128	130	126
CELL (Social intrusion on relationships)	Pearson Correlation	0.110	0.152	0.129	0.088	-0.087	0.169	-0.099	0.071
	Sig. (2-tailed)	0.199	0.075	0.141	0.315	0.330	0.057	0.261	0.430
	N	139	137	131	131	127	128	130	126

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

The results for the correlation analysis reveals that mother (p=0.002) and partner anxiety (p=0.001) has a significant relationship with the technology variable 'Social replacement/intrusion for the HES'.

Mother anxiety (p=0.043), friend avoidance (p=0.008) and friend anxiety (p=0.000) all have a significant relationship with the 'Explicit content for HES' variable. Mother anxiety (p=0.014), father anxiety (p=0.040) and friend anxiety (p=0.012) have a significant relationship with using the PC for social, romantic or sexual improvement. Mother avoidance (p=0.022) and anxiety (p=0.002), father anxiety (p=0.019), partner anxiety (p=0.043) and friend anxiety (p=0.007) all correlated significantly with using the cell phone for relationship and explicit content.

The results for the regression analyses are discussed in each sub-section below where relevant.

4.7.2.1 Regression model of HES Social Replacement / Intrusion with attachment variables

The model yielded a significant result (F=2.537; p=0.014). The amount of the variance in HES : Social replacement / intrusion that is explained by this model can be estimated as R^2=0.148. The contributions of the specific attachment variables can be seen in Table 4.46. As can be seen in the table, HES : Social replacement / intrusion is mainly related to partner anxiety (t=2.741; p=0.007) as a dimension of attachment.

Table 4.46 Coefficients of HES (Social replacement / intrusion) in relation to attachment variables

	Standardized Coefficients		
R=0.384	Beta	t	p
(Constant)		-1.946	0.054
Mother Avoidance	0.069	0.704	0.483
Mother Anxiety	0.218	1.938	0.055
Father Avoidance	0.080	0.730	0.467
Father Anxiety	-0.032	-0.275	0.784
Partner Avoidance	-0.073	-0.740	0.461
Partner Anxiety	0.320	2.741	0.007
Friend Avoidance	-0.063	-0.621	0.536
Friend Anxiety	-0.152	-1.237	0.219

*Statistically significant at the 5% level

4.7.2.2 Regression model of HES Explicit Content with attachment variables

The model yielded a significant result (F=2.486; p=0.017). The amount of the variance in HES : Explicit Content that is explained by this model can be estimated as R^2=0.167. The contributions of the specific attachment variables can be seen in Table 4.47 and as can be seen, HES : Explicit Content is mainly related to friend anxiety (t=-2.579; p=0.011) as a dimension of attachment.

Table 4.47 Coefficients of HES (Explicit content) in relation to attachment variables

R=0.379	Standardized Coefficients Beta	t	p
(Constant)		1.744	0.084
Mother Avoidance	0.017	0.149	0.882
Mother Anxiety	0.055	0.419	0.676
Father Avoidance	0.196	1.565	0.121
Father Anxiety	-0.094	-0.699	0.486
Partner Avoidance	-0.146	-1.376	0.172
Partner Anxiety	0.074	0.604	0.547
Friend Avoidance	-0.118	-1.100	0.274
Friend Anxiety	-0.332	-2.579	0.011

*Statistically significant at the 5% level

4.7.2.3 Regression model of PC: Social / Romantic / Sexual Improvement with attachment variables

The model yielded a significant result (F=2.290; p=0.027). The amount of the variance in PC: Social / Romantic / Sexual Improvement that is explained by this model can be estimated as R^2=0.155. The contributions of the specific attachment variables can be seen in Table 4.48. As can be seen, HES : Explicit Content is primarily related to father avoidance (t=-2.271; p=0.025) and father anxiety (t=2.556; p=0.012).

Table 4.48 Coefficients of PC (Social /romantic /sexual improvement) in relation to attachment variables

R=0.394	Standardized Coefficients Beta	t	p
(Constant)		0.249	0.804
Mother Avoidance	-0.070	-0.661	0.510
Mother Anxiety	0.043	0.351	0.726
Father Avoidance	-0.269	-2.271	0.025
Father Anxiety	0.324	2.556	0.012
Partner Avoidance	-0.084	-0.793	0.429
Partner Anxiety	-0.058	-0.458	0.648
Friend Avoidance	-0.001	-0.007	0.994
Friend Anxiety	0.247	1.866	0.065

*Statistically significant at the 5% level

4.7.2.4 Regression model of PC: High Motivation to Spend Time and attachment variables

The model did not yield a significant result (see Table 4.49 for the full results).

Table 4.49 : Model summary and ANOVA of PC : Motivation to Spend Time and attachment variables

Model	R	R Square	Adjusted R Square	F	p.
1	0.269	0.072	-0.002	0.973	0.461

Predictors: (Constant), Friend Anxiety, Father Avoidance, Partner Avoidance, Mother Avoidance, Friend Avoidance, Mother Anxiety, Partner Anxiety, Father Anxiety

Dependent Variable: New variable 2 (High motivation to spend time using PC) for PC

4.7.2.5 Regression model of CELL: Explicit Content and Relationships and attachment variables

The model yielded a significant result (F=2.089; p=0.042). The amount of the variance in CELL: Explicit Content and Relationships that is explained by this model is estimated as R^2=0.125.

The contributions can be seen in Table 4.50. CELL: Explicit Content and Relationships is mainly related to father anxiety although the contribution is ***not*** significant (t=1.792; p=0.076).

Table 4.50 Coefficients of CELL (Explicit Content and Relationships) in relation to attachment variables

R=0.354	Standardized Coefficients Beta	t	p
(Constant)		-1.641	0.103
Mother Avoidance	0.146	1.470	0.144
Mother Anxiety	0.069	0.610	0.543
Father Avoidance	-0.183	-1.639	0.104
Father Anxiety	0.214	1.792	0.076
Partner Avoidance	-0.027	-0.273	0.785
Partner Anxiety	0.033	0.276	0.783
Friend Avoidance	-0.002	-0.019	0.985
Friend Anxiety	0.130	1.042	0.300

*Statistically significant at the 5% level

4.7.2.6 Regression model of CELL: Social Intrusion on Relationships and attachment variables

The model did not yield a significant result (see Table 4.51 for the results).

Table 4.51 : Model summary and ANOVA of CELL : Social Intrusion on Relationships and attachment variables

Model	R	R Square	Adjusted R Square	F	p.
1	0.326	0.106	0.045	1.735	0.097

Predictors: (Constant), Friend Anxiety, Father Avoidance, Partner Avoidance, Mother Avoidance, Friend Avoidance, Mother Anxiety, Partner Anxiety, Father Anxiety

Dependent Variable: New variable 2 (Social intrusion on relationships) for CELL

4.8 RESEARCH QUESTIONS AND HYPOTHESES

In this section the research questions and hypotheses will be discussed in terms of the findings in the data. It will be seen whether hypotheses are supported or refuted and whether research questions have in fact been answered.

4.8.1 Home entertainment systems

- R_1: How much is invested in the technology that comprises the HES in terms of the number of components that it consists of?

This was explored by means of running frequencies on each component in order to determine what the main components were and the prevalence of such components amongst respondents (see section 4.3.1). A moderate amount of technology is invested in the HES in general especially in terms of viewing DVDs and videos. Component surround sound is also popular although this may have been purchased as part of a package deal when purchasing a DVD player as offered by many retailers. Although satellite television is popular, only 40% of respondents indicated that they had it at home which is most likely due to economic reasons arising from the cost of installation and subscription.

- R_2: Is there a relationship between how much is invested in the HES technology, and attachment?

This research question was tested by means of correlating the number of components of the HES with the attachment variables. No relationship between the amount of technology/components that are invested in the HES and attachment was found.

- R_3: What is the frequency (n; %) of most common use of the HES out of a possible 5 options?

The research question was explored by means of a frequency analysis on Q3 (see section 4.3.1). Almost 80% of respondents indicated that 'Entertainment and recreation' was the primary reason of use for the HES at home.

- R_4: What is the average (mean) amount of time (hours) spent using the HES in a week?

The average time spent using the HES per week was 30 hours, which would come to 4.3 hours a day on average.

- R_5: Is there a relationship between time spent using the HES and attachment?

No significant relationship was found with the attachment variables.

- R_6: Are attitudes to HESs generally positive (n; %), or negative (n; %)?

This research question was explored by comparing the positive attitude statements with the negative attitude statements by means of a frequency analysis. Statements towards HESs were positive but only marginally so. Of the 21 HES statements, 12 statements (57%) were rated positively.

- R_7: Is there a relationship between attitude towards the HES and attachment?

The results for the correlation analysis reveals that mother (p=0.002) and partner anxiety (p=0.001) has a significant relationship with the technology variable 'Social replacement/intrusion for the HES'. Mother anxiety (p=0.043), friend avoidance (p=0.008) and friend anxiety (p=0.000) all have a significant relationship with the 'Explicit content for HES' variable. For the specific attitude variable - HES : Social replacement / intrusion partner anxiety was found to be significant (t=2.741; p=0.007) as a dimension of attachment. For the specific attitude variable - HES : Explicit Content, friend anxiety was found to be significant (t=-2.579; p=0.011) as a dimension of attachment.

- H_1: Greater technological investment in HESs (Q2) correlates with an insecure attachment style (QA, QB, QC and QD).

This was tested by means of a One Way ANOVA between the number of HES components for each individual HES with the six attachment variables in order to see if there is a relationship. No significant relationship between the number of components invested in the HES and attachment was found, therefore the above hypothesis is not supported.

- H_2: Time spent using HESs (Q3) correlates with attachment style (QA, QB, QC and QD).

This was tested by means of a One Way ANOVA between the hours of HES use and the six attachment variables in order to see if there is a relationship. No significant relationship was found and therefore the null hypothesis is supported.

- H_3: There is a significant relationship between the attitude towards HES attributes (Q6) and attachment avoidance (QA, QB, QC and QD).

This hypothesis was tested by means of a canonical correlation analysis as well as a regression analysis (see section 4.7). Neither the canonical correlation analysis nor the regression analysis found a significant relationship between the HES technology variables and attachment avoidance. Therefore the hypothesis is not supported.

- H_4: There is a significant relationship between the attitude towards HES attributes (Q6) and attachment-anxiety (QA, QB, QC and QD).

This hypothesis was tested by means of a canonical correlation analysis as well as a regression analysis (see section 4.7). The canonical correlation analysis revealed that the new variable 'HES: (Social replacement/intrusion)' has a relationship with mother, father and partner anxiety with factor loadings of -0.83, -0.59 and -0.61 respectively. For the regression analysis partner anxiety makes a significant contribution to the variance in HES (Social replacement/intrusion) (t=2.741; p=0.007). Friend anxiety was found to make a significant contribution to the variance in the HES (Explicit content) variable (t=-2.421; p=0.017).

It appears as if the hypothesis is supported even though the relationship is very specific and only applies to mother, partner and friend anxiety.

4.8.2 Personal Computer and Personal Digital Assistants (PDAs)

- R_8: How much is invested in the PC technology in terms of the number of components it consists of?

This was explored by means of running frequencies on each component in order to determine what the main components were and the prevalence of such components amongst respondents (see section 4.4.1). The majority of respondents who had access to a PC at home (62%) had basic systems consisting mainly of 15 and 17 inch monitors, a CD-writer and a printer.

About 30% to 40% of respondents had PCs that consisted of DVD drives, graphics accelerator cards and gaming input devices such as joysticks. Only 27% had at least basic access to the Internet at home. Therefore I conclude that investment in PC technology is at best moderate and consists primarily of a standard system. Whether this is due to economic constraints or personal preference is unclear.

- R_9: Is there a relationship between how much is invested in the PC in terms of the number of components, and attachment?

This research question was tested by means of correlating the number of components of the PC with each of the six attachment variables. No relationship between the amount of technology/components that are invested in the PC and attachment was found.

- R_{10}: What is the frequency (n; %) of most common use of the PC (Q11) out of a possible 5 options?

This research question was explored by means of a frequency analysis on Q11 (see section 4.4.1). More than 50% of respondents (n=67) indicated that 'Entertainment and recreation' was the main use of the PC at home.

- R_{11}: What is the average (mean) amount of time (hours) spent using the PC in a week?

The research question was explored by means of a descriptive analysis on Q12 (see section 4.4.1). The mean amount of time spent using the PC per week was 15 hours, or just over 2 hours a day. This is half the time utilized for HESs.

- R_{12}: Is there a relationship between time spent using the PC and attachment?

The question was tested by means of a correlation analysis and no significant relationship between hours of use and the variables indicating attachment was found.

- R_{13}: Are attitudes to PCs generally positive (n; %), or negative (n; %)?

This research question was explored by comparing the positive attitude statements with the negative attitude statements by means of a frequency analysis (see Table 4.22). On average 58% of respondents had a moderately positive attitude towards PCs. This figure is virtually the same as that for HES statements (57%).

- R_{14}: Is there a relationship between the attitude towards PCs and attachment?

The research question was tested by means of a correlation analysis as well as regression analysis. Father anxiety (p=0.040) and friend anxiety (p=0.012) have a significant relationship with using the PC for social, romantic or sexual improvement for the correlation analysis. For the regression analysis a significant relationship was found for the variance contributed by father avoidance (t=-2.271; p=0.025) and father anxiety (t=2.556; p=0.012) with the PC (Social/romantic/sexual improvement) variable (see section 4.7.2.3).

- H_5: Greater technological investment in PCs (Q10) correlates with an insecure attachment style (QA, QB, QC and QD).

The hypothesis was tested by means of a One Way ANOVA analysis between the number of PC components and the attachment variables (see 4.4.3). No significant relationships were found and the hypothesis is not supported.

- H_6: Time spent using PCs (Q12) correlates with attachment style (QA, QB, QC and QD).

The hypothesis was tested by a One Way ANOVA between the time spent using the PC (Q12) with the attachment variables. No significant relationships were found and the hypothesis is not supported.

- H_7: There is a significant relationship between the attitude towards PC attributes (Q14) and attachment-avoidance (QA, QB, QC and QD).

The hypothesis was tested by way of a correlation, canonical correlation as well as regression analysis (see 4.7). A significant relationship was found for the variance contributed by father avoidance (t=-2.271; p=0.025), with the PC (Social/romantic/sexual improvement) variable. Therefore the hypothesis is supported for attitudes towards using the PC for social, romantic or sexual improvement for the father figure. The lower the avoidance towards the father the more positive the attitude tends to become towards this specific attitude with using PCs.

- H_8: There is a significant relationship between the attitude towards PC attributes (Q14) and attachment-anxiety (QA, QB, QC and QD).

The canonical correlation analysis revealed that the new variable 'PC: (Social/romantic/sexual improvement)' has a relationship with mother, father and partner anxiety with factor loadings of -0.83, -0.59 and -0.61 respectively. The correlation analysis revealed that mother anxiety (p=0.014), father anxiety (p=0.040) and friend anxiety (p=0.012) have a significant relationship with using the PC for social, romantic or sexual improvement. The regression analysis revealed a significant relationship between the variance contributed by father anxiety (t=-2.556; p=0.012), and the PC (Social/romantic/sexual improvement) variable. Therefore the hypothesis is supported. Both father avoidance and father anxiety make significant contributions to the variance in the attitude towards the PC: (Social/romantic/sexual improvement) variable.

4.8.3 Cell phones

- R_{15}: How much technology is invested in the cell phone in terms of the number of functions that it has?

  The research question was investigated by means of a frequency analysis on Q21 (see 4.5.1). Technology invested in cell-phones is moderately high considering that more than 70% of the sample has Internet accessibility on their phones. More than 50% of the sample had video recording capability (54%), video playback (60%) and cameras (70%).

- R_{16}: Is there a relationship between how much technology is invested in the cell phone and attachment?

  The research question was investigated by way of a One Way ANOVA between the number of functions of the cell phone and the attachment variables (see 4.5.3). No statistically significant relationship with attachment was found.

- R_{17}: What is the frequency (n; %) of most common use of the Cell phone (Q22) out of a possible 5 options?

  The question was explored by means of a frequency analysis on Q22 (see 4.5.1). Social and family related accessibility was by far the greatest use of the cell phone (n=107; 68%).

- R_{18}: What is the average (mean) amount of time (minutes) spent using the cell phone in a day?

The mean amount of time spent by respondents on their phones was 82 minutes a day (see 4.5.1). This is half the time spent on PCs and one quarter of the time spent on HESs.

- R_{19}: Is there a relationship between time spent using the cell phone and attachment?

The research question was investigated by means of a One Way ANOVA analysis between the time spent on the cell phone (Q23) and the attachment variables (see 4.5.3). There was no significant relationship with attachment.

- R_{20}: Are attitudes to Cell phones generally positive (n; %) or negative (n; %)?

The research question was investigated by means of a frequency analysis comparing the positive and negative statements on Q25 (see 4.5.1). Respondents in general were mostly positive towards cell phones with 73% of them feeling this way. This is markedly higher than that of HESs (57%) as well as PCs (58%).

- R_{21}: Is there a relationship between attitudes to the cell phone and attachment?

The research question was investigated by a correlation, canonical correlation and regression analysis (see 4.7). The correlation analysis revealed that mother avoidance (p=0.022) and anxiety (p=0.002), father anxiety (p=0.019), partner anxiety (p=0.043) and friend anxiety (p=0.007) all correlated significantly with using the cell phone for relationship and explicit content. The canonical analysis revealed that there was a relationship between attitudes to cell phones and the attachment variables.

The regression analysis did not reveal any further significant relationships. Therefore the hypothesis is supported even though it appears to be more applicable for attachment anxiety.

- H_9: Greater technological investment in Cell phones (Q21) correlates with an insecure attachment style (QA, QB, QC and QD).

The hypothesis was tested by means of a One Way ANOVA analysis between the number of cell phone functions and the attachment variables (see 4.5.3). No significant relationships were found and the hypothesis is not supported.

- H_{10}: Time spent using Cell phones (Q23) correlates with attachment style (QA, QB, QC and QD).

The hypothesis was tested by way of a One Way ANOVA between the time spent using the Cell phone (Q22) and the attachment variables (see 4.5.3). No significant relationships were found and the hypothesis is not supported.

- H_{11}: There is a significant relationship between the attitude towards Cell phone attributes (Q25) and attachment-avoidance (QA, QB, QC and QD).

The hypothesis was tested by means of a correlation analysis, canonical correlation analysis as well as a regression analysis between the attitude variables and the attachment variables (see 4.7). The canonical correlations found no meaningful relationship between any avoidance variables and the technology variables. Mother avoidance ($p=0.022$) correlated significantly with using the cell phone for relationship and explicit content. The regression analysis did not reveal any significant relationships. The hypothesis is supported, but only for those who are avoidant of their mothers.

- H_{12}: There is a significant relationship between the attitude towards Cell phone attributes (Q25) and attachment-anxiety (QA, QB, QC and QD).

The hypothesis was tested by means of a correlation analysis, canonical correlation analysis as well as a regression analysis between the attitude variables and the attachment variables. Mother anxiety (p=0.002), father anxiety (p=0.019), partner anxiety (p=0.043) and friend anxiety (p=0.007) all correlated significantly with using the cell phone for relationship and explicit content. The canonical correlation analysis revealed that the new variable 'Cell: (Explicit content and relationships)' has a relationship with mother, father and partner anxiety with factor loadings of -0.83, -0.59 and -0.61 respectively.

The regression analysis did not reveal any significant relationships between the attitudes towards cell phones and the attachment anxiety variables. Therefore I conclude that the hypothesis above is supported but only for the correlation and canonical correlation analyses.

4.8.4 Attachment styles

- H_{13}: Insecurely attached individuals use recreational technology significantly more than securely attached individuals.

No relationship between the amount of time spent using any of the three recreational technology types and attachment was found when a correlation analysis was conducted (see Appendix 2 Table 14, Appendix 3 Table 9 and Appendix 4 Tables 14). Therefore the hypothesis is not supported.

- H_{14}: A significant relationship exists between attitudes toward recreational technology and attachment style.

The hypothesis was tested by means of a correlation analysis, canonical correlation analysis and regression analysis. The canonical correlation analysis revealed that there is a small yet significant relationship between the attachment variables and the technology variables as can be seen in Table 4.38. For the correlation analysis, a significant relationship was found between the HES: (Explicit content), HES: (Social replacement/intrusion), PC: (Social /romantic/sexual improvement), and CELL: (Explicit content and relationships) and the attachment variables. Specifically for the regression analysis, a decrease in friend anxiety is found in relation to an increase in the positive attitude towards explicit content on the HES (t=-2.421; p=0.017), and contributes 29.8% of the variance in the HES (Explicit content) variable.

An increase in partner anxiety is related to an increased positive attitude towards using the HES for social and/or sexual replacement (t=2.741; p=0.007) and contributes 32% of the variance to the attitude variable. An increase in father anxiety contributes to an increase in the positive attitude towards using the PC for social, romantic and sexual improvement (t=2.556; p=0.012), and contributes 32.4% of the variance to the PC (Social/romantic/sexual improvement) variable. A decrease in father avoidance is related to an increase in the positive attitude towards the PC (Social/romantic/sexual improvement) variable (t=-2.271; p=0.025), and contributes 26.9% to its variance. A similar picture is found between father anxiety and the attitude towards explicit content and social relationships on the cell phone, however the relationship between the variables is outside the 5% level of significance (t=1.795; p=0.076). Even so, an increase in father anxiety contributes 21.4% to the variation in the CELL: (Explicit content and relationships) variable. The hypothesis is therefore supported but in very specific ways and not for all variables.

It is interesting to note once again that it is the anxiety variables and not the avoidance variables that are most affected. The meaning of these results as well as their relationship to the literature will be discussed in Chapter 5.

CHAPTER 5

DISCUSSION

5.1 INTRODUCTION

The purpose of this study was to investigate whether there is a relationship between recreational technology use and attachment styles. This has been done by comparing various technology variables with the attachment variables of the individual's 'significant others' by means of correlation analyses, canonical correlation analyses and regression analyses where applicable and appropriate. The results and findings of the three recreational technology types in relation to attachment will now be discussed below:

5.2 HOME ENTERTAINMENT SYSTEMS

The first research question concerned the amount that was invested in the HES in terms of components. It is clear that an extensive amount is invested in general in terms of HES components with more than 40% of respondents who have access to an HES at home, subscribing to digital satellite television despite the relatively high cost of installation and subscription. More than 90% of respondents with access to a HES at home had a DVD player as part of their system. See section 4.3.1 for the comprehensive results.

The second research question investigated whether there is a relationship between the amount invested in the HES in terms of components and attachment avoidance and anxiety.

The correlation analysis between technological investment and anxiety and avoidance, found no significant relationship between the variables. This is to some extent inconsistent with the proposals of Jones, (2004) and Raeburn et al., (1999). If you have more money to spend on your HES then this does not appear to have psychological consequences for yourself and your immediate 'significant others'.

There was also no significant relationship found between length of HES use per day (4.3 hours) and attachment. The amount of time spent watching television is consistent with Mullan's (1997) estimate that British viewers spend approximately two months of time, for 24 hours a day, in a year in front of the television. It is interesting to note that the high use of the HES for entertainment and recreation is consistent with the postulations made by Gramm (1987) and Mally (1997).

Attitudes towards the HES were positive but only marginally so with 57% of respondents indicating their general approval of the technology. It is interesting to point out that even though attitudes are not significantly positive towards HESs, individuals still spend a large amount of time using their HES for recreational purposes. This may be due to postulations made by early research by Leonard Pearlin (1959) who stated that people generally try to escape from the pressures and stresses of life by watching television.

An attitude, which will give an indication of the preference or dislike of a particular object, situation or idea is not necessarily an accurate predictor of behaviour.

This is in agreement with statements made by Judd et al (1991), however, attitudes do influence behaviour and in the light of the following findings may have preventative and therapeutic value:

For the correlation analysis a decreased attachment anxiety for mother and friend and a decreased avoidance level with a friend appears to lead to an increase in the positive attitude towards using the HES for explicit content. An increased partner and mother attachment anxiety level appears to influence an increase in the positive attitude towards using the HES for social replacement and avoidance.

The more important results of the regression analysis showed that a decrease in friend anxiety contributes to an increase in the positive attitude towards using the HES for explicit content. An increase in partner anxiety was related to an increase in the positive attitude towards using the HES for social replacement and intrusion.

It appears that individuals who are anxiously attached to their mothers and partners view technology for the replacement of social relationships more positively and possibly use HESs to avoid these significant others in order to decrease their anxious feelings towards their mothers or partners by avoiding dealing with the relationship. If so, this would be consistent with research done by Granovetter (1985) and Leonard Pearlin (1959). On the opposite side of the coin it appears that a decrease in an insecure attachment style in relation to the mother as well as best friend leads to increased positive attitudes towards using the HES for explicit content.

It may be that anxiously attached individuals notice explicit content more than securely attached individuals and therefore attribute a greater negative effect or importance to it when reporting on such content. Considering the results in section 4.3.2, this seems to be especially true of male respondents who have significantly more positive attitudes towards explicit content on the HES and is consistent with Klein, (2003).

I propose that the less judgmental your mother and friends are, the more likely you would use the HES for such activities, probably due to being less aware of such content by nature of the less insecure relationship. Explicit content may also serve as a topic of conversation as Taylor and Mullan (1986) propose, in which explicit content in movies and television programmes are discussed and friendships are formed or re-enforced. It may also be that the increased use of the HES leads to guilt feelings and other negative psychological effects which spill over particularly to the relationship with the mother. If so, this would be consistent with Thomée, Eklöf, Gustafsson, Nilsson and Hagberg (2005). Judging from the positive attitudes towards explicit content (sex, nudity, violence and bad language) in general (see Table 4.12), Saltzman, (2004) appears to be correct that explicit content is mostly viewed as a form of entertainment and is not taken as seriously as 'real' problems in the world such as poverty, HIV/AIDS, drug abuse and corruption.

Garland, (2004) states that television and the Internet are having significant impacts on the sexual behaviour as well as sexual relationships. It is interesting to note that in Table 4.12, 63% of individuals disagreed with the statement that 'Sex and / or nudity on the HES has improved my romantic relationship/s'.

Results gathered from open questions reveal that the second highest statement was that HESs do affect social life (11.4%). Some of the effects mentioned were that explicit content had a negative effect on children as well as sometimes on intimate relationships. Sexual content was also seen by some respondents as a precursor to teenage pregnancy, promiscuous sex and the spread of sexually transmitted diseases. Sex on television was also, however, seen by some as educational which could lead to an improvement in intimate relationships.

According to Hibbert (2005), "more viewers are turned off by violence and foul language than nudity, according to a new poll", however this seems mainly to apply to female viewers as section 4.3.2 shows.

In summary, there is no significant relationship between the amount of components invested in the HES, the type of use of the HES, the time spent using the HES and attachment relationships. There is only a relationship between the attitudes towards the HES (specifically explicit content and using the HES for social replacement) and attachment (particularly attachment anxiety). If these results can be replicated in future studies, this would indicate that most of the negative statements of HES technology made by various spokespersons are erroneous. However it would appear that the attitudes of individuals to HES technology (and arguably their behaviour in relation to technology) could be to some extent explained by their relationships with their 'significant others'.

5.3 PERSONAL COMPUTERS AND PERSONAL DIGITAL ASSISTANTS

The first and second research question that was investigated was how much was invested in the PC on average in terms of components of technology and whether there was a relationship with attachment. It was found that the majority of respondents had a basic PC system which consisted of basic components such as a printer, 15 or 17 inch monitor and speakers as well as a mouse and CD-Writer. Less than a third (30%) had some sort of access to the Internet. Investment in PC technology was therefore concluded to be moderate to low. No significant relationship between the number of components of PCs and attachment were found.

The most common use of the PC was for 'Entertainment and recreation' with 54.5% of respondents stating so. A similar picture is present for PDAs and is supported by statements made by Kadel, (2005).

The mean amount of time that respondents used the PC per week was 15 hours which is exactly half the time of HES use (30 hours) per week. Four out of the 15 hours were used for work or educational activities. These findings are in line with the literature (Machrone, 2003; Raeburn et al., 1999) and therefore potentially contradicts the so called positive aspect of technology which allows us to free up more time to spend with our loved ones (Mally, 1997, Vitalari, Venkatesh and Gronhaug, 1985). It in fact consumes a considerable amount of our leisure time and therefore takes away time that could have been spent with loved ones. This is consistent with Harris (2000). However, no significant relationship between time spent on the PC and attachment was found.

When the attitudes towards PC statements were analysed, very similar results as those obtained for HESs were found. Of the statements, 58% were rated positively by respondents, (57% for HES use). Males viewed PC technology more positively in general than females (see section 4.4.2). This may be due to the fact that computer games and PC technology in general is targeted towards male consumers (Many, 2004, Edwards, 2000; Klein, 2003). It may also be that males feel more confident when using PC technology and this leads to a higher rate of computer use as Mcilroy, Sadler and Boojawon (2005) propose or other psychological differences as Chou & Tsai, (2004) postulate. A high level of motivation to spend additional time using the PC contributed 28% to the variation in mother anxiety scores. Whether this is an artifact of increased feelings of competency or confidence in relation to an insecure relationship with the mother figure is unclear (Lundmark, Kiesler, Kraut, Scherlis and Mukhopadhyay, 1998) but would be consistent with a study conducted by Yang and Tung (2004).

An increase father anxiety (for both the regression and correlation analyses) and a decrease in father avoidance for the regression analysis (see Table 4.48) and an increase in mother and friend anxiety (correlation analyses only) contributes to an increase in the positive attitude towards using the PC for social, romantic or sexual improvement. Interestingly, a decrease in father avoidance also leads to an increase in the positive attitude towards using the PC for social, romantic or sexual improvement. It may be that the father introduces the individual to the use of such activities on the PC.

It seems that individuals use the PC to keep a distance from real relationships and/or to find ways of improving these real relationships in an attempt to decrease feelings of anxiety towards the mother, father and friend figure which is in contrast to the statements of Thorpe and Brosnan (2005) and consistent with an anonymous study (Anonymous source: *Scholastic Scope*, 2004) who found that anxiety levels experienced in relation to computer usage, could reach the extent where they could be classified as a pathological specific phobia according to DSM-IV criteria. It may also be that increased PC use causes psychological deterioration which affects the individual's relationship with the specific 'significant other'. This would then be in agreement with research done by Thomée, Eklöf, Gustafsson, Nilsson and Hagberg (2005). This may point to the potential addictive qualities as found by Barbara Meltz (2005) and Yang and Tung (2004). However, it may simply be that negative relationships with the mother, father or friend figure are replaced or sublimated by building positive or alternative relationships via the Internet (Zaczek, 2004).

It is interesting to note that the majority of respondents would replace PC based activities by watching TV or a movie should the PC be unavailable or absent from the home. The literature supports this finding (Kraut, Mukhopadhyay, Szczypula, Kiesler and Scherlis, 1998; Gloria Goodale 2005).

Granovetter (1985) states that information technology has the capability to isolate organisations, societies and individuals. There is some support for this from the open questions asked of HES, PC and cell phone technology (see sections 4.3.4, 4.4.4 and 4.5.4) as well as the attitudes towards HESs for 'mother avoidance', and for the PCs for 'father avoidance'. This seems to show that people with attachment issues are more vulnerable than their securely attached counterparts.

5.4 PERSONAL DIGITAL ASSISTANTS

No significant findings were found between PDA variables and attachment variables. PDAs were very scarce (only 6% of respondents used them at home. The majority, who did use them, used them for recreation and Internet and e-mail related activities to friends and family (30%) (see Appendix 3 Table 10). This is consistent with propositions made by Kadel (2005).

5.5 CELLULAR PHONES

The first research question investigated how much was invested in cell phones in terms of functionality and whether there was a relationship with attachment in any way. Investment in cell phones was generally high with more than half of respondents having a phone comprising of video recording and playback functionality as well as a camera (see section 4.5.1). No significant relationship between the number of functions and attachment style was found.

The majority of respondents primarily use their phone in order to ensure contact with friends and family. Only 14% used it primarily for entertainment purposes.

The amount of time on average that respondents spent using their phones in a day was 82 minutes which indicates a significant amount of time spent using the phone. In the light of the second research question above, it may be inferred that cell phones facilitate and potentially increase social activities with friends and family. No significant relationship between time spent using the cell phone and attachment was found.

Generally, attitudes towards cell phones are very favourable, with 11 out of the 15 attributes (73.4%) being positive towards cell phones. Cell phones are perceived more positively than both PC (58%) and HES (57%) technology.

The correlation analysis revealed that an increase in mother avoidance and anxiety, father anxiety, partner anxiety and friend anxiety all correlated significantly with an increase in the positive attitude towards using the cell phone for relationship and explicit content. This phenomenon is in contrast with Garland, (2004) that technology in itself changes perceptions towards explicit content on recreational technology. It seems that insecure attachment relationships lead to an increase in the use of technology for explicit content and relationship activity, probably in an attempt to compensate for the lack of warmth in the individual's real relationships.

It is interesting to note that the statements made by Yegyazarian, (2005, p.1) appear to warrant special attention in the light of these findings as an increase in using the cell phone for explicit and relationship content has begun to prompt serious attention from various stakeholders.

5.6 ATTACHMENT STYLES AND RECREATIONAL TECHNOLOGY

The hypothesis below was investigated due to many of the postulations in the research (Gramm, 1987; Mally, 1997; Jones, 2004; Robinson and Godbey, 2005) attributing an importance to the amount of time spent using recreational technology:

- H_{17}: Insecurely attached individuals use recreational technology significantly more than securely attached individuals.

In the light of this study however, time spent using recreational technology did not result in any significant relationships with any attachment variables and therefore the hypothesis above is not supported.

The first research question investigated whether attitudes to recreational technology had a relationship with attachment styles. As can be seen in sections 4.8.1 to 4.8.3, there is a relationship with attitudes to technology and attachment style, however these relationships are very specific and mostly influence attachment anxiety. The results will be discussed in the relevant sections below.

5.6.1 Home entertainment systems and attachment style

A decrease in friend anxiety (t=-2.421; p=0.017) (independent variable) is found in relation to an increase in the positive attitude towards explicit content on the HES (dependent variable), and contributes 29.8% of the variance in the HES (Explicit content) variable. It seems that a secure attachment relationship with a friend would contribute towards an increase in using the HES for explicit content (most likely in the presence of the friend).

A significant relationship was found using partner anxiety as an independent variable, with HES (Social replacement/intrusion) (t=2.741; p=0.007). An increase in partner anxiety seems to contribute to an increase in the positive attitude towards social replacement and intrusion with the HES. An insecure relationship with a romantic partner therefore seems to drive individuals to technology use in order to replace the relationship on some level.

5.6.2 Personal computers and attachment style

An increase in father anxiety (t=2.556; p=0.012) (independent variable) contributes to an increase in the positive attitude towards using the PC for social, romantic and sexual improvement (dependent variable), and contributes 32.4% of the variance to the PC (Social/romantic/sexual improvement) variable. Increased father anxiety appears to be increasing the positive attitude towards improving normal relationships with online relationships.

Also, a significant relationship was found using father avoidance as an independent variable, with PC (Social/romantic/sexual improvement) (t=-2.271; p=0.025). Decreased father-avoidance seems to be contributing towards increasingly positive attitudes towards using the PC for social, romantic and sexual improvement as indicated by the negative beta value (-0.269). It is unclear why this is the case as both anxious and avoidant relationships are considered 'bad' and complimentary. It may be that avoiding the father figure leads to a decrease in stress and therefore a decrease in the need to use the PC to maintain online relationships. The anxious individual may not be able to avoid the father figure and therefore develops an alternative means to cope with this stress. It may also be that the father introduces the individual to the use of such activities on the PC.

5.6.3 Cell phones and attachment style

An increase in mother avoidance and anxiety, father anxiety, partner anxiety and friend anxiety (correlation analysis only) contributed significantly to the variation in the CELL: (Explicit content and relationships) variable. This is a similar picture to the increase in father anxiety contributing to increased positive attitude towards social replacement as mentioned in section 5.6.3. It seems that insecure and especially anxious relationships increase the likelihood that an individual will use his/her cell phone for relationship and explicit activities, probably in an attempt to compensate for these less than satisfactory 'real' relationships.

Therefore I conclude that the hypothesis below is supported but in very exclusive and specific ways, and not in all cases, as has been demonstrated on the previous page (see sections 5.6.1 to 5.6.3):

- H_{18}: A significant relationship exists between attitudes toward recreational technology and attachment style.

As can be seen, it appears that insecure relationships, especially the anxious type, drive individuals towards increased technology use, seemingly in an attempt to replace these with other relationships by way of the technology. These 'replacement technological relationships' are often explicit in nature most likely in an attempt to achieve some level of intimacy.

5.6.4 Summary and conclusions

In summary, the current research showed the extent of recreational technology use within the home, the level of investment in the given technologies, time spent using the technology and attitudes towards each specific technology according to pre-defined attributes. Opportunities were also given for respondents to 'colour in' the quantitative data with voluntary open-ended responses. Demographic variables were recorded and reported upon in relation to recreational technologies. Specifically, the study showed that there are relationships between attachment styles and recreational technology.

Descriptive results revealed that recreational technology is pervasive in homes, especially in regard to the HES and cell-phone. Investment in recreational technology was moderate for the HES and PC but highest for cell phones.

Time spent using recreational technology was extensive, especially for the HES and cell phone technologies, although the cell phone technology costs appear to be limiting the time spent using this technology. The primary uses for the HES and PC was 'Recreation and entertainment', but for cell phones it was 'Family and social accessibility' indicating a fundamental difference between the three technologies. Attitudes towards the HES and PC were marginally favourable but very favourable towards cell phones in general. This seems to be due to the increased 'social' aspect that the cell phone allows for. Demographic results revealed that males in general viewed technology more positively than females. Males were also more likely to state that the technologies improved their social and sexual relationships. There were also significant differences in the viewing of sex and nudity, where more females stated that they had seen explicit content on the HES and PC and males had seen more on their cell phones. Black respondents viewed HES and PC technology more positively and spent more time using it, with resultant personally disclosed negative consequences for their social relationships.

Investment in technology had no significant relationship with attachment.

Open questions revealed that in the case of HES technology, viewing should be controlled for children in order to guard them from the effects of explicit content. This was also the case for PC and cell phone technology.

The educational potential and social potential (raises topics for conversation and 'breaks the ice' in relationships) are viewed positively, even though the majority of individuals would rather go out or socialize or both than utilize the HES. Explicit content is viewed negatively for all three technologies especially sex, however, as mentioned earlier more so for females than males. Chat rooms, e-mail, Internet and online-dating were stated to help establish and maintain relationships, however, much stigma was attached to these as they were perceived to be mainly utilized by lonely, desperate and socially unskilled people. Cell phones were primarily utilised for maintaining and improving existing relationships. In the absence of all three technology types, replacement with an alternative technology was often the case. However intellectual and physical activities such as exercise, sport, studying and reading would also increase in the absence of one or more technologies.

The canonical and regression analyses revealed that there are significant relationships between recreational technology and attachment style, even though these relationships were not particularly strong. From the canonical correlation analysis it was revealed that the most important technology factors that contributed to attachment style were 'Social replacement and intrusion via the HES', 'Social, romantic and sexual improvement via the PC', and using the cell phone for explicit content and maintaining social relationships. These three technology variables specifically influenced the mother, father and partner ***anxiety*** variables. All three the attachment-anxiety relationships increased somewhat with a resultantly increasing negative perception towards the three technology factors.

When a regression analysis was conducted in order to confirm or refute these relationships, as well as to gain a deeper insight into the nature of the relationship, some interesting findings were revealed. An increase in mother anxiety increased positive attitudes to HES use for social replacement and intrusion. A relationship was found using father avoidance as an independent variable, with PC (Social/romantic/sexual improvement). It appears that a decrease in father avoidance leads to a more positive attitude towards using the PC for social, romantic and sexual activities. The opposite was found for father anxiety as an independent variable, with PC (Social/romantic/sexual improvement) as a dependent variable. The higher the father anxiety the more likely the individual would perceive social, romantic and sexual improvement via the PC as positive. It seems that having a highly anxious relationship or a close relationship with the father figure leads to an increased positive attitude towards using the PC for social, romantic and sexual improvement related activities. I would even propose that a highly anxious relationship with the father in which avoidance is low would enhance this phenomenon.

A significant relationship was found using partner anxiety as an independent variable, with HES (Social replacement/intrusion) as a dependent variable.

An increase in partner anxiety appears to be related to an increase in the positive attitude towards using the HES as a social replacement or intrusion device.

No relationship was found between the technology variables and friend-avoidance. However, the attitude towards viewing of explicit content (sex, nudity, violence and bad language) on the HES has a significant relationship with friend anxiety. A significant relationship was also found using friend anxiety as an independent variable, with HES (Explicit content). A decrease in friend anxiety leads to an increase in the positive attitude towards explicit content on the HES.

In conclusion, technology has a complex relationship with attachment styles. Attitudes towards technology are mostly influenced by attachment anxiety, however avoidance does plays a smaller part in the picture specifically with the father figure. It seems that technology is often used to replace social, romantic and sexual relationships in relationship to a generally insecure relationship with a 'specific other'. The father-avoidance and father-anxiety results however show an alternative picture, whereby a more secure relationship with the father figure resulted in a more positive attitude towards using the PC for social, romantic and sexual improvement.

5.6.5 Future research and limitations

These findings show that attitudes toward technology use are affected by social relationships. The study also shows that the effects of relationships are in many cases very subtle and not explicitly obvious. Many of the obvious assumptions such as that insecure attachments will lead to using technology more, will lead to one specific type of use or lead to greater investment in technology remain unfounded in this study.

More research is necessary in order to gain a deeper insight into the relationship between technology use and social relationships.

It would be worthwhile to investigate what the long term consequences of technology use on social relationships would be via a longitudinal study.
It would also be interesting to investigate whether the effects of social relationships on technology change with time.

It would also be interesting to investigate whether a repeat study yields similar results. A controlled study whereby a securely attached group is compared with an insecurely attached group may also yield a greater understanding of the relationship between attitudes to technology and attachment style. It would be worthwhile to add an instrument which could psychologically profile individuals and groups in order to determine what other variables may be contributing to the changes in attitudes to technology and attachment style. Confounding variables may be identified in this way.

A study which includes a much broader spectrum of the population in terms of age and gender (preferably a representative sample of the population) would surely contribute to the validity of the study and allow for generalisability. Virtually all the individuals in the study were scholars and very young and therefore it cannot be assumed that similar results will be obtained from the general adult population. Relatively few had a romantic partner, which may have influenced the gathering of valuable data in this regard. Differences may exist with regard to older respondents especially since older respondents may be less inclined to use technology, especially information and cellular technology.

Keep in mind that the sample was taken from a technical high school, which would imply that most of the students are probably interested in and inherently inclined towards using technology.

A qualitative study investigating the reasons for using technology as a replacement for social relationships as well as explicit content, as well as eliciting reasons for and teasing out the nature of increased social, romantic and sexual improvement in the light of a secure father relationship should reveal valuable information. It would also be interesting to investigate why there are such specific and radical differences between 'significant others' and the technology variables. It is unclear as to why this is so and reasons proposed in this study are speculative at best.

Another limitation was that the data gathered was self-reported and even though every precaution was taken to remove spoilt papers and unreasonable outliers, the results may be somewhat biased due to memory errors, assuming people have clear insight into their own motives and are truthful about it, and playing the fool for example.

It is also reasonable to point out that since the majority of findings revolved around the attitudes towards technology variables, observers should be very cautious in assuming that the attitude will result in corresponding behaviour (Wicker, 1969).

To conclude, since the instrument was created from scratch by the researcher due to the unavailability of an instrument, it is probable that the instrument may suffer from various small design limitations. The questionnaire attempted to sample a wide range of information related to how people use recreational technology. Certain components were identified in the factor analyses, but these need to be further clarified and further validated. Applying the explanations to a different sample would also hopefully aid further clarification. Therefore all results should be interpreted with caution.

Despite these limitations which could be improved upon in future work, it is hoped that this could make a useful contribution to the understanding of the relationships between technology use and social relationships.

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APPENDIX 1

RELATIONSHIP DEMOGRAPHICS

Table 1 : Frequency distribution of household size

Individuals in household	Frequency	Percent	Cumulative Percent
1	2	1.2	1.2
2	3	1.8	3.1
3	21	12.9	16.0
4	55	33.7	49.7
5	41	25.2	74.8
6	28	17.2	92.0
7	3	1.8	93.9
8	3	1.8	95.7
9	3	1.8	97.5
10	2	1.2	98.8
13	1	0.6	99.4
18	1	0.6	100.0
Total	163	100.0	

Table 2 : Frequency distribution of friends visited at least once a month

Number of friends	Frequency	Percent
0	6	4.2
1 to 5	54	38.0
6 to 10	35	24.6
11 to 15	12	8.5
16 or more	35	24.6
Total	142	100.0

APPENDIX 2

HOME ENTERTAINMENT SYSTEMS

Table 1 : Frequency distribution of HES accessibility at home

	Frequency	Percent	Cumulative Percent
Yes	160	95.81	95.81
No	7	4.19	100
Total		100	

Table 2 : Descriptive statistics for primary use of HES

Type of use	Frequency	Percent	Cumulative Percent
Work, business, economic info	9	5.42	5.42
Education	19	11.45	16.87
Entertainment & recreation	128	77.11	93.98
Distraction	4	2.41	96.39
Sleep	1	0.60	96.99
None	5	3.01	100.00
Total	166	100.00	

Table 3 : Frequency distribution of alternate activity in absence of HES

Activity	Frequency	Percent
Socialise	78	46.71
Exercise / Sports / Outdoors	55	32.93
Homework / Study	44	26.35
Sleep	35	20.96
Read	32	19.16
Go out / Party	30	17.96
Hobbies	25	14.97
Chores	13	7.78
Play Computer Games	9	5.39
Eat	5	2.99
Shopping	5	2.99
Listen to music	4	2.40
Watch a movie	4	2.40
Work	4	2.40
Community Service	1	0.60
Nothing	1	0.60
Relax	1	0.60

Table 4 Frequency distribution of General HES comments

Comment	Frequency	Percent
Educational tool	26	12.87
Affects social life	23	11.39
Affects children	21	10.40
Enjoy it	19	9.41
Do not like the sex	18	8.91
Should be controlled	16	7.92
Does not affect social life	16	7.92
People tend to do what they see on TV	15	7.43
I personally do not have a problem with it	13	6.44
Do not like the nudity	8	3.96
Other	7	3.47
Waste of time	6	2.97
Do not like the violence	6	2.97
Do not like the bad language	6	2.97
Can lead to violence	2	0.99

Table 5 : Cross tabulation of Gender and Improvement of social relationships due to viewing of HES

		*P=0.018	HESs have improved my social life					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Gender / Sex	Male	Count	7	12	40	37	12	108
		% within Gender / Sex	6.5	11.1	37.0	34.3	11.1	100.0
	Female	Count	0	16	22	13	5	56
		% within Gender / Sex	0.0	28.6	39.3	23.2	8.9	100.0
Total		Count	7	28	62	50	17	164
		% within Gender / Sex	4.3	17.1	37.8	30.5	10.4	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 6 : Cross tabulation of Gender and Viewing of sex on the HES

		*P=0.001	I have seen sex on the TV					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Gender / Sex	Male	Count	34	31	20	12	8	105
		% within Gender / Sex	32.4	29.5	19.0	11.4	7.6	100.0
	Female	Count	10	7	20	5	14	56
		% within Gender / Sex	17.9	12.5	35.7	8.9	25.0	100.0
Total		Count	44	38	40	17	22	161
		% within Gender / Sex	27.3	23.6	24.8	10.6	13.7	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 7 : Cross tabulation of Gender and Viewing of nudity on the HES

		*P=0.010	I have seen nudity on the TV					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Gender / Sex	Male	Count	34	29	26	9	8	106
		% within Gender / Sex	32.1	27.4	24.5	8.5	7.5	100.0
	Female	Count	8	9	20	10	9	56
		% within Gender / Sex	14.3	16.1	35.7	17.9	16.1	100.0
Total		Count	42	38	46	19	17	162
		% within Gender / Sex	25.9	23.5	28.4	11.7	10.5	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 8 : Cross tabulation of Gender and Improvement of romantic relationships due to sexual content on the HES

		*P=0.000	Sex and / or nudity on the HES has improved my romantic relationship/s					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Gender / Sex	Male	Count	29	27	26	16	10	108
		% within Gender / Sex	26.9	25.0	24.1	14.8	9.3	100.0
	Female	Count	36	11	7	2	0	56
		% within Gender / Sex	64.3	19.6	12.5	3.6	0.0	100.0
Total		Count	65	38	33	18	10	164
		% within Gender / Sex	39.6	23.2	20.1	11.0	6.1	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 9 : Cross tabulation of Gender and Viewing of violence on the HES

		*P=0.026	Violence on TV is bad					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Gender / Sex	Male	Count	24	29	32	16	7	108
		% within Gender / Sex	22.2	26.9	29.6	14.8	6.5	100.0
	Female	Count	5	11	20	9	11	56
		% within Gender / Sex	8.9	19.6	35.7	16.1	19.6	100.0
Total		Count	29	40	52	25	18	164
		% within Gender / Sex	17.7	24.4	31.7	15.2	11.0	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 10 : Cross tabulation of Gender and bad language content on the HES

		*P=0.001	Bad language on TV is good					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Gender / Sex	Male	Count	17	31	35	14	11	108
		% within Gender / Sex	15.7	28.7	32.4	13.0	10.2	100.0
	Female	Count	23	17	13	2	1	56
		% within Gender / Sex	41.1	30.4	23.2	3.6	1.8	100.0
Total		Count	40	48	48	16	12	164
		% within Gender / Sex	24.4	29.3	29.3	9.8	7.3	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 11 : One Way ANOVA (Post Hoc) of Age and agreement towards HES variables (only significant relationships displayed)

Dependent Variable	(I) Bio5_Age3	(J) Bio5_Age3	Mean Difference (I-J)	Std. Error	p.	95% Confidence Interval	
						Lower Bound	Upper Bound
I enjoy TV programmes in general	16	17	0.056	0.189	0.768	-0.318	0.430
		18+	-0.336	0.194	0.084	-0.719	0.046
	17	16	-0.056	0.189	0.768	-0.430	0.318
		18+	-0.392	0.178	0.029	-0.744	-0.041
	18+	16	0.336	0.194	0.084	-0.046	0.719
		17	0.392	0.178	0.029	0.041	0.744
I have seen sex on the TV	16	17	0.353	0.267	0.189	-0.175	0.881
		18+	0.577	0.272	0.036	0.039	1.115
	17	16	-0.353	0.267	0.189	-0.881	0.175
		18+	0.224	0.251	0.374	-0.273	0.721
	18+	16	-0.577	0.272	0.036	-1.115	-0.039
		17	-0.224	0.251	0.374	-0.721	0.273
I have seen nudity on the TV	16	17	0.041	0.249	0.868	-0.450	0.533
		18+	0.668	0.255	0.010	0.165	1.171
	17	16	-0.041	0.249	0.868	-0.533	0.450
		18+	0.627	0.234	0.008	0.165	1.089
	18+	16	-0.668	0.255	0.010	-1.171	-0.165
		17	-0.627	0.234	0.008	-1.089	-0.165
Sex and / or nudity on the HES has improved my romantic relationship/s	16	17	-0.605	0.242	0.014	-1.083	-0.127
		18+	-0.661	0.248	0.008	-1.150	-0.172
	17	16	0.605	0.242	0.014	0.127	1.083
		18+	-0.056	0.226	0.805	-0.503	0.391
	18+	16	0.661	0.248	0.008	0.172	1.150
		17	0.056	0.226	0.805	-0.391	0.503

* The mean difference is significant at the .05 level.

Table 12 : One Way ANOVA (Post Hoc) of Race and HES variables (only significant relationships displayed)

Dependent Variable	(I) Ethnicity	(J) Ethnicity	Mean Difference (I-J)	Std. Error	p.	95% Confidence Interval	
						Lower Bound	Upper Bound
I will rather watch a movie than visit friends or family	Black	White	-0.542	0.182	0.003	-0.902	-0.182
		Other	-0.268	0.293	0.361	-0.846	0.310
	White	Black	0.542	0.182	0.003	0.182	0.902
		Other	0.274	0.290	0.346	-0.298	0.845
	Other	Black	0.268	0.293	0.361	-0.310	0.846
		White	-0.274	0.290	0.346	-0.845	0.298
I wish I could spend more time watching my HES	Black	White	-0.293	0.170	0.088	-0.629	0.044
		Other	-0.720	0.274	0.009	-1.261	-0.178
	White	Black	0.293	0.170	0.088	-0.044	0.629
		Other	-0.427	0.272	0.118	-0.964	0.109
	Other	Black	0.720	0.274	0.009	0.178	1.261
		White	0.427	0.272	0.118	-0.109	0.964
People around me complain about me using my HES all the time	Black	White	-0.488	0.199	0.015	-0.881	-0.094
		Other	-0.356	0.327	0.277	-1.002	0.289
	White	Black	0.488	0.199	0.015	0.094	0.881
		Other	0.131	0.324	0.686	-0.509	0.772
	Other	Black	0.356	0.327	0.277	-0.289	1.002
		White	-0.131	0.324	0.686	-0.772	0.509
I have seen sex on the TV	Black	White	0.545	0.221	0.015	0.109	0.980
		Other	0.622	0.352	0.079	-0.073	1.317
	White	Black	-0.545	0.221	0.015	-0.980	-0.109
		Other	0.077	0.349	0.825	-0.612	0.767
	Other	Black	-0.622	0.352	0.079	-1.317	0.073
		White	-0.077	0.349	0.825	-0.767	0.612
I have seen nudity on the TV	Black	White	0.572	0.206	0.006	0.164	0.979
		Other	0.554	0.330	0.095	-0.098	1.206
	White	Black	-0.572	0.206	0.006	-0.979	-0.164
		Other	-0.018	0.328	0.957	-0.665	0.630
	Other	Black	-0.554	0.330	0.095	-1.206	0.098
		White	0.018	0.328	0.957	-0.630	0.665
I sometimes do too little work because I am using my HES	Black	White	-0.510	0.217	0.020	-0.939	-0.081
		Other	-0.365	0.350	0.299	-1.055	0.326
	White	Black	0.510	0.217	0.020	0.081	0.939
		Other	0.145	0.347	0.676	-0.539	0.830
	Other	Black	0.365	0.350	0.299	-0.326	1.055
		White	-0.145	0.347	0.676	-0.830	0.539
I often think about using my HES at home when I am at friends, family, church, the movies or trying to sleep	Black	White	-0.083	0.184	0.654	-0.446	0.281
		Other	-0.826	0.296	0.006	-1.411	-0.241
	White	Black	0.083	0.184	0.654	-0.281	0.446
		Other	-0.744	0.294	0.012	-1.323	-0.164
	Other	Black	0.826	0.296	0.006	0.241	1.411
		White	0.744	0.294	0.012	0.164	1.323

Sex and / or nudity on the HES has improved my romantic relationship/s	Black	White	-0.597	0.199	0.003	-0.990	-0.205
		Other	0.027	0.320	0.934	-0.605	0.658
	White	Black	0.597	0.199	0.003	0.205	0.990
		Other	0.624	0.317	0.051	-0.002	1.250
	Other	Black	-0.027	0.320	0.934	-0.658	0.605
		White	-0.624	0.317	0.051	-1.250	0.002
Bad language on TV is good	Black	White	0.193	0.191	0.315	-0.184	0.570
		Other	0.885	0.307	0.005	0.278	1.492
	White	Black	-0.193	0.191	0.315	-0.570	0.184
		Other	0.692	0.304	0.024	0.091	1.293
	Other	Black	-0.885	0.307	0.005	-1.492	-0.278
		White	-0.692	0.304	0.024	-1.293	-0.091
HESs hamper my relationships with my friends	Black	White	-0.811	0.168	0.000	-1.142	-0.479
		Other	-0.626	0.269	0.021	-1.158	-0.094
	White	Black	0.811	0.168	0.000	0.479	1.142
		Other	0.185	0.267	0.491	-0.343	0.712
	Other	Black	0.626	0.269	0.021	0.094	1.158
		White	-0.185	0.267	0.491	-0.712	0.343
HESs hamper my relationships with my family	Black	White	-0.414	0.178	0.021	-0.766	-0.063
		Other	-0.261	0.286	0.364	-0.826	0.305
	White	Black	0.414	0.178	0.021	0.063	0.766
		Other	0.154	0.284	0.588	-0.406	0.714
	Other	Black	0.261	0.286	0.364	-0.305	0.826
		White	-0.154	0.284	0.588	-0.714	0.406
Hours per week of use	Black	White	0.755	0.256	0.004	0.248	1.261
		Other	0.990	0.425	0.021	0.150	1.829
	White	Black	-0.755	0.256	0.004	-1.261	-0.248
		Other	0.235	0.416	0.573	-0.587	1.057
	Other	Black	-0.990	0.425	0.021	-1.829	-0.150
		White	-0.235	0.416	0.573	-1.057	0.587

* The mean difference is significant at the .05 level.

Table 13 : One Way ANOVA between Number of HES components and Attachment variables

Attachment variable		Sum of Squares	df	Mean Square	F	p.
Mother Avoidance	Between Groups	18.342	10	1.834	1.149	0.330
	Within Groups	234.568	147	1.596		
	Total	252.910	157			
Mother Anxiety	Between Groups	38.101	10	3.810	1.384	0.193
	Within Groups	399.202	145	2.753		
	Total	437.302	155			
Father Avoidance	Between Groups	10.382	10	1.038	0.417	0.936
	Within Groups	330.932	133	2.488		
	Total	341.314	143			
Father Anxiety	Between Groups	42.599	10	4.260	1.258	0.261
	Within Groups	450.484	133	3.387		
	Total	493.083	143			
Partner Avoidance	Between Groups	14.594	10	1.459	0.864	0.569
	Within Groups	217.976	129	1.690		
	Total	232.571	139			
Partner Anxiety	Between Groups	29.299	10	2.930	1.058	0.400
	Within Groups	360.141	130	2.770		
	Total	389.440	140			
Friend Avoidance	Between Groups	12.915	10	1.292	0.779	0.648
	Within Groups	225.368	136	1.657		
	Total	238.283	146			
Friend Anxiety	Between Groups	22.986	10	2.299	0.905	0.531
	Within Groups	335.219	132	2.540		
	Total	358.205	142			

Table 14 : One Way ANOVA between Hours of use and Attachment variables

Attachment variable		Sum of Squares	df	Mean Square	F	p.
Mother Avoidance	Between Groups	5.611	5	1.122	0.712	0.615
	Within Groups	212.805	135	1.576		
	Total	218.416	140			
Mother Anxiety	Between Groups	10.976	5	2.195	0.867	0.505
	Within Groups	334.060	132	2.531		
	Total	345.036	137			
Father Avoidance	Between Groups	6.329	5	1.266	0.531	0.752
	Within Groups	290.800	122	2.384		
	Total	297.128	127			
Father Anxiety	Between Groups	17.002	5	3.400	0.980	0.433
	Within Groups	423.228	122	3.469		
	Total	440.230	127			
Partner Avoidance	Between Groups	1.481	5	0.296	0.173	0.972
	Within Groups	206.065	120	1.717		
	Total	207.546	125			
Partner Anxiety	Between Groups	11.807	5	2.361	0.914	0.474
	Within Groups	309.946	120	2.583		
	Total	321.752	125			
Friend Avoidance	Between Groups	16.154	5	3.231	2.168	0.062
	Within Groups	186.321	125	1.491		
	Total	202.476	130			
Friend Anxiety	Between Groups	14.303	5	2.861	1.231	0.299
	Within Groups	281.279	121	2.325		
	Total	295.582	126			

APPENDIX 3

PERSONAL COMPUTER SYSTEMS AND PDAs

Table 1 : Cross tabulation of Gender and PCs have improved my social life

		*P=0.000	Personal Computers / Laptops have improved my social life					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Gender / Sex	Male	Count	16	16	32	25	7	96
		% within Gender / Sex	16.7	16.7	33.3	26.0	7.3	100.0
	Female	Count	8	16	12	3	6	45
		% within Gender / Sex	17.8	35.6	26.7	6.7	13.3	100.0
Total		Count	24	32	44	28	13	141
		% within Gender / Sex	17.0	22.7	31.2	19.9	9.2	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 2 : Cross tabulation of Gender and Increased PC functionality

		*P=0.037	I expect more from computer technology in terms of what I can do with it					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Gender / Sex	Male	Count	4	12	22	36	21	95
		% within Gender / Sex	4.2	12.6	23.2	37.9	22.1	100.0
	Female	Count	2	7	19	6	11	45
		% within Gender / Sex	4.4	15.6	42.2	13.3	24.4	100.0
Total		Count	6	19	41	42	32	140
		% within Gender / Sex	4.3	13.6	29.3	30.0	22.9	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 3 : Cross tabulation of Gender and PC game enjoyment

		*P=0.017	I enjoy PC games					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Gender / Sex	Male	Count	6	4	12	37	36	95
		% within Gender / Sex	6.3	4.2	12.6	38.9	37.9	100.0
	Female	Count	8	0	12	13	11	44
		% within Gender / Sex	18.2	0.0	27.3	29.5	25.0	100.0
Total		Count	14	4	24	50	47	139
		% within Gender / Sex	10.1	2.9	17.3	36.0	33.8	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 4 : Cross tabulation of Gender and Viewing of sex on the Internet

		*P=0.001	I have seen sex on the internet					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Gender / Sex	Male	Count	23	27	23	14	9	96
		% within Gender / Sex	24.0	28.1	24.0	14.6	9.4	100.0
	Female	Count	7	4	12	6	16	45
		% within Gender / Sex	15.6	8.9	26.7	13.3	35.6	100.0
Total		Count	30	31	35	20	25	141
		% within Gender / Sex	21.3	22.0	24.8	14.2	17.7	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 5 : Cross tabulation of Gender and Improvement of romantic relationship due to sex and nudity on the Internet

		*P=0.002	Sex and or nudity on the internet has improved my romantic relationship/s					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Gender / Sex	Male	Count	44	23	17	4	6	94
		% within Gender / Sex	46.8	24.5	18.1	4.3	6.4	100.0
	Female	Count	36	8	1	0	0	45
		% within Gender / Sex	80.0	17.8	2.2	0.0	0.0	100.0
Total		Count	80	31	18	4	6	139
		% within Gender / Sex	57.6	22.3	12.9	2.9	4.3	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 6 : Cross tabulation of Gender and Improvement of friendships due to sex and nudity on the Internet

		*P=0.019	Nudity / sex has improved my relationship with my friends					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Gender / Sex	Male	Count	49	22	14	5	3	93
		% within Gender / Sex	52.7	23.7	15.1	5.4	3.2	100.0
	Female	Count	35	9	1	0	0	45
		% within Gender / Sex	77.8	20.0	2.2	0.0	0.0	100.0
Total		Count	84	31	15	5	3	138
		% within Gender / Sex	60.9	22.5	10.9	3.6	2.2	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 7 : Cross tabulation of Race and Perception that Internet has too much rubbish on it

*P=0.003			I think the internet has too much rubbish on it					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Ethnicity group	Black	Count	16	11	21	5	4	57
		% within Ethnicity group	28.1	19.3	36.8	8.8	7.0	100
	White	Count	15	13	15	20	5	68
		% within Ethnicity group	22.1	19.1	22.1	29.4	7.4	100
	Other	Count	2	4	5	0	5	16
		% within Ethnicity group	12.5	25.0	31.3	0.0	31.3	100
Total		Count	33	28	41	25	14	141
		% within Ethnicity group	23.4	19.9	29.1	17.7	9.9	100

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 8 : One Way ANOVA between the Number of PC components and Attachment variables

Attachment variable		Sum of Squares	df	Mean Square	F	p.
Mother Avoidance	Between Groups	14.602	11	1.327	0.813	0.627
	Within Groups	238.308	146	1.632		
	Total	252.910	157			
Mother Anxiety	Between Groups	18.033	11	1.639	0.563	0.856
	Within Groups	419.269	144	2.912		
	Total	437.302	155			
Father Avoidance	Between Groups	26.880	11	2.444	1.026	0.427
	Within Groups	314.434	132	2.382		
	Total	341.314	143			
Father Anxiety	Between Groups	28.761	11	2.615	0.743	0.695
	Within Groups	464.322	132	3.518		
	Total	493.083	143			
Partner Avoidance	Between Groups	14.249	11	1.295	0.759	0.680
	Within Groups	218.322	128	1.706		
	Total	232.571	139			
Partner Anxiety	Between Groups	51.403	11	4.673	1.783	0.063
	Within Groups	338.037	129	2.620		
	Total	389.440	140			
Friend Avoidance	Between Groups	6.250	11	0.568	0.331	0.978
	Within Groups	232.033	135	1.719		
	Total	238.283	146			
Friend Anxiety	Between Groups	16.020	11	1.456	0.558	0.860
	Within Groups	342.185	131	2.612		
	Total	358.205	142			

Table 9 : One Way ANOVA between Hours of PC use and Attachment variables

Attachment variable		Sum of Squares	df	Mean Square	F	p.
Mother Avoidance	Between Groups	52.990	36	1.472	0.914	0.608
	Within Groups	95.027	59	1.611		
	Total	148.017	95			
Mother Anxiety	Between Groups	118.036	36	3.279	1.347	0.154
	Within Groups	141.151	58	2.434		
	Total	259.187	94			
Father Avoidance	Between Groups	73.288	35	2.094	1.090	0.384
	Within Groups	97.973	51	1.921		
	Total	171.261	86			
Father Anxiety	Between Groups	112.965	35	3.228	1.046	0.435
	Within Groups	157.385	51	3.086		
	Total	270.351	86			
Partner Avoidance	Between Groups	42.018	33	1.273	1.035	0.448
	Within Groups	62.771	51	1.231		
	Total	104.789	84			
Partner Anxiety	Between Groups	46.432	33	1.407	0.441	0.993
	Within Groups	162.815	51	3.192		
	Total	209.247	84			
Friend Avoidance	Between Groups	56.711	35	1.620	1.281	0.202
	Within Groups	69.561	55	1.265		
	Total	126.273	90			
Friend Anxiety	Between Groups	62.133	35	1.775	0.815	0.737
	Within Groups	115.481	53	2.179		
	Total	177.614	88			

Table 10 : Correlations between hours of PDA use and attachment

		Hours of use in total?	Mother Avoidance	Mother Anxiety	Father Avoidance	Father Anxiety	Partner Avoidance	Partner Anxiety	Friend Avoidance	Friend Anxiety
Hours of use in total?	Pearson Correlation	1.000	-0.269	-0.109	0.264	-0.285	-0.126	-0.388	-0.034	0.188
	Sig. (2-tailed)	.	0.485	0.779	0.492	0.458	0.767	0.302	0.931	0.628
	N	9	9	9	9	9	8	9	9	9

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

APPENDIX 4

CELLPHONES

Table 1 : Cross tabulation of Gender and Sleeping with the cell phone off

		*P=0.016	I sleep with my phone OFF					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Gender / Sex	Male	Count	45	28	8	6	11	98
		% within Gender / Sex	45.9	28.6	8.2	6.1	11.2	100.0
	Female	Count	38	11	5	1	0	55
		% within Gender / Sex	69.1	20.0	9.1	1.8	0.0	100.0
Total		Count	83	39	13	7	11	153
		% within Gender / Sex	54.2	25.5	8.5	4.6	7.2	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 2 : Cross tabulation of Gender and Cell phones hampering relationships with family

		*P=0.013	Cell phones hamper my relationships with my family					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Gender / Sex	Male	Count	31	14	21	23	10	99
		% within Gender / Sex	31.3	14.1	21.2	23.2	10.1	100.0
	Female	Count	7	4	22	12	10	55
		% within Gender / Sex	12.7	7.3	40.0	21.8	18.2	100.0
Total		Count	38	18	43	35	20	154
		% within Gender / Sex	24.7	11.7	27.9	22.7	13.0	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 3 : Cross tabulation of Gender and Viewing of sex on the cell phone

		*P=0.002	I have seen sex on my cell phone					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Gender / Sex	Male	Count	25	16	12	26	20	99
		% within Gender / Sex	25.3	16.2	12.1	26.3	20.2	100.0
	Female	Count	31	6	7	7	4	55
		% within Gender / Sex	56.4	10.9	12.7	12.7	7.3	100.0
Total		Count	56	22	19	33	24	154
		% within Gender / Sex	36.4	14.3	12.3	21.4	15.6	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 4 : Cross tabulation of Gender and Viewing of nudity on the cell phone

		*P=0.005	I have seen nudity on my cell phone					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Gender / Sex	Male	Count	23	12	17	30	17	99
		% within Gender / Sex	23.2	12.1	17.2	30.3	17.2	100.0
	Female	Count	29	5	8	9	4	55
		% within Gender / Sex	52.7	9.1	14.5	16.4	7.3	100.0
Total		Count	52	17	25	39	21	154
		% within Gender / Sex	33.8	11.0	16.2	25.3	13.6	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 5 : Cross tabulation of Gender and Improvement of relationship with romantic partner due to viewing of sex and/or nudity on the cell phone

		*P=0.002	Nudity and/or sex on my cell phone has improved my relationship with my partner					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Gender / Sex	Male	Count	41	23	17	11	7	99
		% within Gender / Sex	41.4	23.2	17.2	11.1	7.1	100.0
	Female	Count	38	11	2	0	4	55
		% within Gender / Sex	69.1	20.0	3.6	0.0	7.3	100.0
Total		Count	79	34	19	11	11	154
		% within Gender / Sex	51.3	22.1	12.3	7.1	7.1	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 6 : Cross tabulation of Gender and Improvement of relationship with friends due to viewing of sex and/or nudity on the cell phone

		*P=0.001	Nudity and / or sex on my cell phone has improved my relationship with my friends					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Gender / Sex	Male	Count	45	30	16	6	2	99
		% within Gender / Sex	45.5	30.3	16.2	6.1	2.0	100.0
	Female	Count	37	14	0	0	4	55
		% within Gender / Sex	67.3	25.5	0.0	0.0	7.3	100.0
Total		Count	82	44	16	6	6	154
		% within Gender / Sex	53.2	28.6	10.4	3.9	3.9	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 7 : Cross tabulation of Gender and Improvement of relationship with family due to viewing of sex and/or nudity on the cell phone

		*P=0.004	Nudity and / or sex on my cell phone has improved my relationship with my family					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Gender / Sex	Male	Count	53	24	13	7	2	99
		% within Gender / Sex	53.5	24.2	13.1	7.1	2.0	100.0
	Female	Count	39	12	0	0	4	55
		% within Gender / Sex	70.9	21.8	0.0	0.0	7.3	100.0
Total		Count	92	36	13	7	6	154
		% within Gender / Sex	59.7	23.4	8.4	4.5	3.9	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 8 : Cross tabulation of Race and Cost of cell phone calls

		*P=0.003	Cell phone calls are expensive					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Ethnicity group	Black	Count	3	9	21	25	5	63
		% within Ethnicity group	4.8	14.3	33.3	39.7	7.9	100.0
	White	Count	3	4	14	26	29	76
		% within Ethnicity group	3.9	5.3	18.4	34.2	38.2	100.0
	Other	Count	2	2	2	4	7	17
		% within Ethnicity group	11.8	11.8	11.8	23.5	41.2	100.0
Total		Count	8	15	37	55	41	156
		% within Ethnicity group	5.1	9.6	23.7	35.3	26.3	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 9 : Cross tabulation of Race and Directly visiting friends or family as opposed to calling them on the cell phone

		*P=0.002	I will rather visit friends or family than phone them on their cell phones					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Ethnicity group	Black	Count	11	14	22	5	12	64
		% within Ethnicity group	17.2	21.9	34.4	7.8	18.8	100.0
	White	Count	2	11	18	29	16	76
		% within Ethnicity group	2.6	14.5	23.7	38.2	21.1	100.0
	Other	Count	3	2	4	4	4	17
		% within Ethnicity group	17.6	11.8	23.5	23.5	23.5	100.0
Total		Count	16	27	44	38	32	157
		% within Ethnicity group	10.2	17.2	28.0	24.2	20.4	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 10 : Cross tabulation of Race and Cell phones hampering relationships with romantic partners

*P=0.002			Cell phones hamper my relationship with my partner					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Ethnicity group	Black	Count	9	5	16	20	14	64
		% within Ethnicity group	14.1	7.8	25.0	31.3	21.9	100.0
	White	Count	17	19	19	11	9	75
		% within Ethnicity group	22.7	25.3	25.3	14.7	12.0	100.0
	Other	Count	8	2	3	0	4	17
		% within Ethnicity group	47.1	11.8	17.6	0.0	23.5	100.0
Total		Count	34	26	38	31	27	156
		% within Ethnicity group	21.8	16.7	24.4	19.9	17.3	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 11 : Cross tabulation of Race and Cell phones hampering relationships with family

*P=0.016			Cell phones hamper my relationships with my friends					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Ethnicity group	Black	Count	9	5	16	20	14	64
		% within Ethnicity group	14.1	7.8	25.0	31.3	21.9	100.0
	White	Count	17	19	19	11	9	75
		% within Ethnicity group	22.7	25.3	25.3	14.7	12.0	100.0
	Coloured	Count	8	2	3	0	4	17
		% within Ethnicity group	47.1	11.8	17.6	0.0	23.5	100.0
Total		Count	34	26	38	31	27	156
		% within Ethnicity group	21.8	16.7	24.4	19.9	17.3	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 12 : Cross tabulation of Race and Cell phones hampering relationships with friends

*P=0.011			Cell phones hamper my relationships with my family					
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Ethnicity group	Black	Count	10	4	16	20	14	64
		% within Ethnicity group	15.6	6.3	25.0	31.3	21.9	100.0
	White	Count	23	12	22	13	5	75
		% within Ethnicity group	30.7	16.0	29.3	17.3	6.7	100.0
	Coloured	Count	7	2	5	2	1	17
		% within Ethnicity group	41.2	11.8	29.4	11.8	5.9	100.0
Total		Count	40	18	43	35	20	156
		% within Ethnicity group	25.6	11.5	27.6	22.4	12.8	100.0

**Pearson Chi-Square (Asymptotic 2 sided significance)*

Table 13 : One Way ANOVA between Number of Cell phone functions and Attachment variables

Attachment variable		Sum of Squares	df	Mean Square	F	p.
Mother Avoidance	Between Groups	32.749	17	1.926	1.225	0.253
	Within Groups	220.161	140	1.573		
	Total	252.910	157			
Mother Anxiety	Between Groups	62.034	17	3.649	1.342	0.176
	Within Groups	375.269	138	2.719		
	Total	437.302	155			
Father Avoidance	Between Groups	46.475	17	2.734	1.168	0.300
	Within Groups	294.839	126	2.340		
	Total	341.314	143			
Father Anxiety	Between Groups	71.461	17	4.204	1.256	0.232
	Within Groups	421.622	126	3.346		
	Total	493.083	143			
Partner Avoidance	Between Groups	17.953	17	1.056	0.600	0.886
	Within Groups	214.618	122	1.759		
	Total	232.571	139			
Partner Anxiety	Between Groups	68.138	17	4.008	1.534	0.093
	Within Groups	321.302	123	2.612		
	Total	389.440	140			
Friend Avoidance	Between Groups	18.856	17	1.109	0.652	0.844
	Within Groups	219.426	129	1.701		
	Total	238.283	146			
Friend Anxiety	Between Groups	37.227	17	2.190	0.853	0.630
	Within Groups	320.977	125	2.568		
	Total	358.205	142			

Table 14 : One Way ANOVA between minutes of Cell phone use and Attachment variables

Attachment variable		Sum of Squares	df	Mean Square	F	p.
Mother Avoidance	Between Groups	69.316	37	1.873	1.427	0.098
	Within Groups	97.183	74	1.313		
	Total	166.499	111			
Mother Anxiety	Between Groups	119.297	36	3.314	1.340	0.144
	Within Groups	183.022	74	2.473		
	Total	302.319	110			
Father Avoidance	Between Groups	59.548	37	1.609	0.561	0.971
	Within Groups	192.059	67	2.867		
	Total	251.607	104			
Father Anxiety	Between Groups	130.239	37	3.520	0.982	0.514
	Within Groups	240.127	67	3.584		
	Total	370.365	104			
Partner Avoidance	Between Groups	53.420	35	1.526	0.836	0.713
	Within Groups	116.787	64	1.825		
	Total	170.207	99			
Partner Anxiety	Between Groups	103.640	36	2.879	1.043	0.433
	Within Groups	176.732	64	2.761		
	Total	280.373	100			
Friend Avoidance	Between Groups	62.375	35	1.782	1.339	0.151
	Within Groups	90.513	68	1.331		
	Total	152.888	103			
Friend Anxiety	Between Groups	95.283	35	2.722	1.126	0.334
	Within Groups	157.207	65	2.419		
	Total	252.490	100			

APPENDIX 5

FACTOR ANALYSIS

Table 1 Rotated Factor Matrix for HES attitudinal variables

Variables	Factors						
	1 (Eigenv = 3.502)	2 (Eigenv = 2.694)	3 (Eigenv = 1.451)	4	5	6	7
HESs have improved my social life	-0.337	0.192	0.160	0.254	0.120	0.215	-0.058
HESs hamper my relationships with my partner	-0.098	0.165	-0.050	0.448	0.135	0.107	0.035
HESs are a waste of time in general	0.193	-0.064	-0.055	-0.171	-0.445	0.056	-0.058
I will rather watch a movie than visit friends or family	0.005	0.010	0.014	0.017	0.010	0.562	0.114
I expect more from HES technology in terms of what I can do with it.	0.020	0.081	0.161	-0.041	0.297	0.131	-0.107
I wish I could spend more time watching my HES	-0.071	0.134	0.135	0.368	0.323	0.580	0.067
People around me complain about me using my HES all the time	-0.077	0.113	0.490	0.076	0.099	0.220	0.326
At home I leave my HES on all the time	0.041	0.244	0.412	0.148	0.066	0.116	0.156
I enjoy TV programmes in general	-0.024	0.034	-0.076	-0.049	0.482	0.078	0.165
I have seen sex on the TV	0.823	0.136	0.072	-0.004	0.090	-0.060	0.048
I have seen nudity on the TV	0.856	0.060	-0.001	-0.099	0.117	-0.188	0.110
I sometimes do too little work because I am using my HES	0.084	0.112	0.026	0.124	0.109	0.136	0.778
I often think about using my HES at home when I am at friends, family, church, the movies or trying to sleep	0.093	0.144	0.140	0.652	-0.146	0.046	0.082
I often have social gatherings around my HES for watching sport, movies and/or TV	0.019	0.085	0.228	0.321	0.192	-0.254	0.185
I use my HES to help me sleep	0.006	0.203	0.532	-0.039	-0.114	-0.092	-0.187
I have a HES in my bedroom	0.069	-0.067	0.556	0.162	0.464	-0.032	0.003
Sex and / or nudity on the HES has improved my romantic relationship/s	-0.474	0.267	0.086	0.124	0.267	-0.192	0.115
Violence on TV is bad	0.578	0.149	0.170	0.071	-0.168	0.055	-0.016
Bad language on TV is good	-0.315	0.115	0.136	-0.108	0.141	-0.110	0.015
HESs hamper my relationships with my friends	0.070	0.729	0.161	0.169	0.084	0.067	0.077
HESs hamper my relationships with my family	0.031	0.753	0.163	0.200	0.072	0.011	0.062

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization.

Table 2 Rotated Factor Matrix for PC attitudinal variables

Variables	Factor						
	1 (Eigenv = 6.088)	2 (Eigenv = 2.610)	3 (Eigenv = 1.817)	4	5	6	7
Personal Computers / Laptops have improved my social life	0.186	0.096	0.049	0.171	0.677	-0.121	-0.123
Personal Computers / Laptops hamper my relationship with my partner	0.087	0.029	0.196	0.564	0.253	-0.024	-0.119
Personal Computers / Laptops are a waste of time in general	-0.333	0.208	0.035	-0.088	-0.362	0.299	-0.157
I will rather speak to someone personally than send them an e-mail	-0.089	-0.141	-0.326	-0.135	-0.309	-0.045	-0.121
I expect more from computer technology in terms of what I can do with it	0.203	0.020	-0.033	0.081	0.106	0.037	0.018
I wish I could spend more time on my Personal Computer / Laptop	0.587	-0.009	0.081	0.014	0.443	0.093	0.117
People around me complain about me using my Personal Computer / Laptop all the time	0.526	0.343	0.012	0.146	0.113	0.045	0.126
At home I leave my Personal Computer / Laptop on all the time	0.483	0.058	0.237	0.116	0.213	0.065	0.180
I enjoy PC games	0.456	-0.019	-0.062	0.078	0.258	-0.336	-0.022
I think the internet has too much rubbish on it	-0.113	0.094	-0.029	0.057	0.014	0.604	-0.174
I have seen sex on the internet	0.081	-0.266	0.011	-0.041	-0.092	0.599	0.019
I sometimes do too little work because I am using my PC	0.566	0.092	0.161	0.079	-0.061	-0.165	0.212
I often think about using my PC at home when I am at friends, family, church, the movies or trying to sleep	0.583	0.139	0.005	0.298	-0.001	-0.085	-0.111
I have attempted to find a romantic partner on the internet	-0.013	0.082	0.751	0.154	-0.011	0.087	0.173
I have had a successful romantic relationship due to using the internet	0.249	0.195	0.754	0.110	-0.030	0.000	-0.001
I have maintained a relationship (romantic and/or friendship) by using the internet	0.016	0.202	0.774	0.095	0.147	-0.130	0.057
Sex and or nudity on the internet has improved my romantic relationship/s	0.169	0.623	0.236	0.069	-0.047	-0.198	0.126
I would rather spend time on my Personal Computer / Laptop than go out to see friends, family, partner	0.583	0.144	0.204	0.149	0.215	0.071	-0.101
Personal Computers / Laptops hamper my relationships with my friends	0.340	0.161	0.372	0.713	-0.014	0.020	0.054
Personal Computers / Laptops hamper my relationships with my family	0.273	0.166	0.056	0.633	0.134	0.022	0.284
I have seen nudity on the internet	0.059	0.100	0.267	-0.008	-0.036	-0.191	0.557
Nudity / sex on my computer has improved my relationship with my partner	0.061	0.549	0.017	0.320	-0.008	-0.045	0.487
Nudity / sex has improved my relationship with my family	0.179	0.800	0.202	0.104	0.133	0.057	-0.036
Nudity / sex has improved my relationship with my friends	0.054	0.878	0.156	0.029	0.037	0.005	0.042

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization.

Table 3 Rotated Factor Matrix for Cell phone attitudinal variables

Variables	Factor					
	1 (Eigenv = 4.695)	2 (Eigenv = 2.761)	3 (Eigenv = 1.584)	4	5	6
Cell phones have improved my social life	0.213	0.313	0.320	0.155	0.421	0.055
Cell phones are an invasion of privacy	-0.030	0.188	0.091	0.616	-0.033	-0.270
Cell phone calls are expensive	-0.042	0.048	-0.002	0.130	0.011	0.816
Cell phones often disrupt my life	0.192	-0.083	0.088	0.564	-0.290	0.211
I expect more from cellular technology in terms of functionality	0.109	0.006	0.014	0.639	0.094	0.092
I spend too much time on my cell phone	0.054	0.141	0.794	0.123	0.195	0.039
People around me complain about me using my phone	0.121	0.077	0.815	0.054	0.080	-0.086
I leave my phone ON in class, meetings, the movies, church, or interviews in case someone needs to get hold of me	0.047	-0.127	0.080	0.049	0.795	0.045
I will rather visit friends or family than phone them on their cell phones	-0.070	-0.205	0.002	-0.198	-0.089	0.711
I sleep with my phone OFF	-0.015	-0.148	-0.158	0.100	-0.566	0.133
Cell phones hamper my relationship with my partner	0.032	0.860	0.054	0.116	0.181	-0.089
Cell phones hamper my relationships with my friends	-0.001	0.949	0.066	-0.027	-0.003	0.005
Cell phones hamper my relationships with my family	-0.015	0.841	0.244	0.117	-0.074	-0.111
I would rather spend time on my cell phone than go out to see friends, family, partner	0.089	0.122	0.353	0.537	0.066	-0.192
I sometimes do too little work because I am using my cell phone	0.238	0.227	0.510	0.356	0.097	0.168
I have seen sex on my cell phone	0.807	0.035	-0.122	0.179	0.309	0.021
I have seen nudity on my cell phone	0.830	0.118	-0.083	0.041	0.247	0.096
Nudity and / or sex on my cell phone has improved my relationship with my partner	0.864	-0.002	0.137	0.129	0.011	-0.131
Nudity and / or sex on my cell phone has improved my relationship with my friends	0.844	-0.061	0.326	0.002	-0.132	-0.064
Nudity and / or sex on my cell phone has improved my relationship with my family	0.752	-0.038	0.322	0.100	-0.276	-0.084

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Table 4 Rotated Factor Matrix for HES attitudinal variables restricted to two factors

Variables	Factor 1	2
HESs have improved my social life	0.352	-0.394
HESs hamper my relationships with my partner	0.341	-0.165
HESs are a waste of time in general	-0.278	0.252
I will rather watch a movie than visit friends or family	0.157	-0.057
I expect more from HES technology in terms of what I can do with it.	0.204	-0.034
I wish I could spend more time watching my HES	0.513	-0.199
People around me complain about me using my HES all the time	0.484	-0.095
At home I leave my HES on all the time	0.510	0.022
I enjoy TV programmes in general	0.178	-0.089
I have seen sex on the TV	0.226	0.815
I have seen nudity on the TV	0.097	0.829
I sometimes do too little work because I am using my HES	0.364	0.053
I often think about using my HES at home when I am at friends, family, church, the movies or trying to sleep	0.400	0.036
I often have social gatherings around my HES for watching sport, movies and/or TV	0.365	-0.003
I use my HES to help me sleep	0.227	0.043
I have a HES in my bedroom	0.424	-0.013
Sex and / or nudity on the HES has improved my romantic relationship/s	0.292	-0.454
Violence on TV is bad	0.202	0.578
Bad language on TV is good	0.086	-0.290
HESs hamper my relationships with my friends	0.608	0.052
HESs hamper my relationships with my family	0.604	0.022

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization.

Table 5 Rotated Factor Matrix for PC attitudinal variables restricted to two factors

Variables	Factor 1	2
Personal Computers / Laptops have improved my social life	0.121	0.469
Personal Computers / Laptops hamper my relationship with my partner	0.264	0.328
Personal Computers / Laptops are a waste of time in general	0.123	-0.558
I will rather speak to someone personally than send them an e-mail	-0.362	-0.213
I expect more from computer technology in terms of what I can do with it	-0.007	0.264
I wish I could spend more time on my Personal Computer / Laptop	0.095	0.658
People around me complain about me using my Personal Computer / Laptop all the time	0.367	0.447
At home I leave my Personal Computer / Laptop on all the time	0.339	0.397
I enjoy PC games	0.002	0.550
I think the internet has too much rubbish on it	0.024	-0.171
I have seen sex on the internet	-0.184	-0.029
I sometimes do too little work because I am using my PC	0.267	0.459
I often think about using my PC at home when I am at friends, family, church, the movies or trying to sleep	0.193	0.548
I have attempted to find a romantic partner on the internet	0.540	0.018
I have had a successful romantic relationship due to using the internet	0.633	0.156
I have maintained a relationship (romantic and/or friendship) by using the internet	0.626	0.074
Sex and or nudity on the internet has improved my romantic relationship/s	0.648	0.067
I would rather spend time on my Personal Computer / Laptop than go out to see friends, family, partner	0.292	0.559
Personal Computers / Laptops hamper my relationships with my friends	0.526	0.450
Personal Computers / Laptops hamper my relationships with my family	0.363	0.459
I have seen nudity on the internet	0.333	0.059
Nudity / sex on my computer has improved my relationship with my partner	0.560	0.099
Nudity / sex has improved my relationship with my family	0.711	0.096
Nudity / sex has improved my relationship with my friends	0.699	-0.043

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization.

Table 6 Rotated Factor Matrix for Cell phone attitudinal variables restricted to two factors

Variables	Factor 1	Factor 2
Cell phones have improved my social life	0.256	0.442
Cell phones are an invasion of privacy	0.097	0.324
Cell phone calls are expensive	-0.019	-0.037
Cell phones often disrupt my life	0.262	0.040
I expect more from cellular technology in terms of functionality	0.210	0.163
I spend too much time on my cell phone	0.240	0.448
People around me complain about me using my phone	0.285	0.394
I leave my phone ON in class, meetings, the movies, church, or interviews in case someone needs to get hold of me	0.117	0.082
I will rather visit friends or family than phone them on their cell phones	-0.078	-0.282
I sleep with my phone OFF	-0.043	-0.236
Cell phones hamper my relationship with my partner	-0.064	0.781
Cell phones hamper my relationships with my friends	-0.147	0.774
Cell phones hamper my relationships with my family	-0.076	0.815
I would rather spend time on my cell phone than go out to see friends, family, partner	0.240	0.379
I sometimes do too little work because I am using my cell phone	0.353	0.441
I have seen sex on my cell phone	0.703	0.087
I have seen nudity on my cell phone	0.682	0.110
Nudity and / or sex on my cell phone has improved my relationship with my partner	0.850	0.107
Nudity and / or sex on my cell phone has improved my relationship with my friends	0.855	0.064
Nudity and / or sex on my cell phone has improved my relationship with my family	0.742	0.089

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization.

Table 7 : Eigenvalues of the HES, PC and Cell phone components for the factor analyses

Component (HES)	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	3.502	16.678	16.678
2	2.694	12.826	29.505
3	1.451	6.912	36.416

Component (PC)	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	6.088	25.368	25.368
2	2.61	10.874	36.242
3	1.817	7.572	43.814

Component (Cell phone)	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	4.695	23.475	23.475
2	2.761	13.804	37.279
3	1.584	7.919	45.198

APPENDIX 6

INSTRUMENTS FOR DATA COLLECTION

DEAR SURVEY PARTICIPANT

This research study will be conducted as part of my Masters in Research Psychology Dissertation.

All information and responses gathered in this survey will remain strictly confidential and will be put together with other people's answers. Only I (Martin Schentke) as researcher as well as my supervisor Professor Piet Kruger of the University of South Africa (UNISA) will have access to the individual questionnaires for research and analysis purposes. Under no circumstances will this individual information be given to any other party, unless deemed absolutely necessary for me to complete my dissertation. Even in such a case, the utmost care will be taken to ensure the confidentiality and privacy of ALL participants.

The purpose of this study is to determine whether there is a relationship between technology use and social relationships, and if so what that relationship is.

There are no right or wrong answers. We are only interested in your opinions and experiences.

You may refuse to participate at any time and for any reason, and refusal will not result in ANY negative consequences. If you decide NOT to participate please return this questionnaire uncompleted to the person that gave it to you, so that it can be used by someone else.

NO PERSON under the age of 16 is allowed to complete this survey. By adding your signature below, you give consent that you are 16 years or older and that you are freely willing to participate in this survey. Your results cannot be used if you do not sign this page below to give your consent.

_____

Signature

I hereby give consent that I am 16 years of age, or older and that I am willing to participate in this survey.

If you have any problems or queries in this regard, please feel free to contact Martin Schentke at 084 662 7934.

GENERAL QUESTIONNAIRE INSTRUCTIONS

Please mark ONLY the boxes with ☐ thin borders

DO NOT mark the boxes with ☐ thick borders. These are for office use only.

BIOGRAPHICAL QUESTIONNAIRE

Instructions

a) Please mark the appropriate box with an "X" where applicable.
b) Please write your opinions and comments in pen in the space provided, where applicable.

1. First name or alias or nickname (Please do not supply your surname in the interests of confidentiality. This is in case I need to get hold of you to clear up any uncertainties with the data and / or questionnaire) :

_____

2. Contact number. This is in case I need to get hold of you to clear up any problems with the data and / or questionnaire) :

( )_____

3. Email address (If you want a summary of the thesis results sent to you) :

_____

4. What is your gender?

Male	Female

5. What is your age in years?

6. Please specify your employment status :

☐ Employed Please specify job type : _____

☐ Unemployed

7. What is your individual range of gross income (before tax) per month? (Mark only one) :

☐	Not applicable
☐	R0 – R1 000
☐	R1 001 – R5 000
☐	R5 001 – R10 000
☐	R10 001 – R20 000
☐	R20 000 +

8. What is your Ethnicity Group? (Please supply first or home language where applicable, e.g. Sotho, Tswana, English, Afrikaans, French, Japanese, Indian, etc.)

☐	Black – specify home language	_____
☐	White – specify home language	_____
☐	Coloured – specify home language	_____
☐	Asian – specify home language	_____
☐	Other – specify home language	_____

9. What is the size of your household?

☐	☐	☐

10. How many friends do you have, that you visit or that visit you at least once a month?

☐	☐	☐

11.1 Are you married?

Yes ☐	No ☐

11.2 If yes, how long in years?

☐	☐

12.1 If NOT married, are you in an exclusive dating relationship with someone?

Yes ☐	No ☐

12.2 If YES, how long have you been in this relationship in years?

☐	☐

RECREATIONAL TECHNOLOGY USE QUESTIONNAIRE

Instructions

a) Please mark the appropriate box with an "X" where applicable.
b) Please write your opinions and comments in pen in the space provided, where applicable.

A. HOME ENTERTAINMENT SYSTEM (HES) OWNERSHIP, USAGE AND SOCIAL IMPACT

1. Do you have access to a Home Entertainment System (HES) in your household, consisting of at least a television or monitor and / or any or all of the following? Projector; video recorder / player; DVD recorder / player; MNet decoder; DSTV decoder; component surround sound; kinetic feedback devices.

Yes	No

2. What does your Home Entertainment System (HES) consist of? Mark any or all of the applicable boxes :

	Television
	Monitor
	Big Screen Television or projector
	Video recorder / player
	DVD player
	DVD recorder
	MNet decoder
	DSTV decoder
	Component Surround Sound
	Kinetic feedback device / s

3. What is the primary (most common) use of the Home Entertainment System? Mark only one :

☐	Work / Business / Economic information
☐	Education
☐	Entertainment and Recreation
☐	Distraction
☐	Helps me sleep
☐	None

4. How many hours do you spend in total per week, using your Home Entertainment System?

5. What would you do with your time instead, in the absence of your Home Entertainment System?

6. Please mark the extent to which you agree or disagree with the following statements, with an "X" in the applicable box :

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. HESs have improved my social life					
2. HESs hamper my relationships with my partner					
3. HESs are a waste of time in general					
4. I will rather watch a move than visit friends or family					
5, I expect more from HES technology in terms of what I can do with it					
6. I wish I could spend more time watching my HES					
7. People around me complain about me using my HES all the time					
8. At home I leave my HES on all the time					
9. I enjoy TV programmes in general					
10. I have a problem seeing sex on the HES					
11. I have a problem seeing nudity on the HES					
12. I sometimes do too little work because I am using my HES					
13. I often think about using my HES at home when I am at fiends, family, church, the movies or trying to sleep					
14. I often have social gatherings around my HES for watching sport, movies and / or TV					
15. I use my HES to help me sleep					
16. I have a HES in my bedroom					
17. Sex and / or nudity on the HES has improved my romantic relationship / s					
18. Violence on TV is bad					
19 Bad language on TV is good					
20. HESs hamper my relationships with my friends					
21. HESs hamper my relationships with my family					

7. What are your comments, if any, about HESs in general, movies, violence, sex, nudity and / or language in relation to your personal and social relationships?

8. Do you prefer to go out to the movies OR to watch DVD's / Videos at home?

Go out	Home

Specify main reason:

B. PERSONAL COMPUTER. LAPTOP OWNERSHIP, USAGE AND SOCIAL IMPACT

9. Do you have a Personal Computer / Laptop at home?

Yes	No

10. What does your Personal Computer / Laptop consist of? Mark all that apply (If you are not sure or do not know, leave it blank) :

	15”/17” Monitor, CPU Box, Keyboard, Mouse, Speakers, CD-Rom / Laptop
	CD-writer
	Dial-up Modem Internet connection
	Printer
	Scanner
	DVD-Rom
	DVD-Writer
	1 Gigabyte of RAM / memory or more
	Surround Sound capability and speakers
	Graphics Accelerator Card
	19”/21” Monitor
	ISDN / ADSL / Sentech broadband Internet connection
	Joysticks, game-pads, steering wheels and / or other gaming input devices
	Wireless keyboard and / or mouse

11. What is the primary (most common) use of the Personal Computer / Laptop at home? Mark ONLY ONE item :

☐	I do not use the Personal Computer / Laptop at home
☐	For work / business / economic activities
☐	Education
☐	Entertainment and Recreation
☐	Social activities (such as email and chat rooms)
☐	Other

Please specify :_____

12. How much time do you personally use the Personal Computer / Laptop at home in hours per week? :

☐	For work / business / economic / educational activities?
☐	For recreation / leisure / social activities?
☐	In total?

13. What would you do with your time instead, in the absence of your Personal Computer / Laptop?

_____

_____

_____

14. Please mark the extent to which you agree or disagree with the following statements with an "X" in the applicable box :

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Personal Computers / Laptops have improved my social life					
2. Personal Computers / Laptops hamper my relationship with my partner					
3. Personal Computers / Laptops are a waste of time in general					
4. I will rather speak to someone personally than send them an e-mail					
5. I expect more from computer technology in terms of what I can do with it					
6. I wish I could spend more time on my Personal Computer / Laptop					
7. People around me complain about me using my Personal Computer / Laptop all the time					
8. At home I leave my Personal Computer / laptop on all the time					
9. I enjoy PC games					
10. I think the Internet has too much rubbish on it					
11. I have a problem with seeing sex on the Internet					
12. I sometimes do too little work because I am using my PC					
13. I often think about using my PC at home when I am at friends, family, church, the movies or trying to sleep					
14. I have attempted to find a romantic partner on the Internet via chat rooms, blogs, e-mail or match-making services					
15. I have had a successful romantic relationship due to using the Internet, chat rooms, blogs, e-mail and / or match-making services					
16. I have maintained a relationship (romantic and / or friendship) by using the Internet, chat rooms, blogs, e-mail and / or match making services, for longer than 6 months					
17. Sex and or nudity on the Internet has improved my romantic relationship/ s					
18. I would rather spend time on my Personal Computer / Laptop than go out to see friends, family or a partner					
19. Personal Computers / Laptops hamper my relationships with my friends					
20. Personal Computers / Laptops hamper my relationships with my family					
21. I have seen nudity on the Internet					
22. Nudity / sex on my computer as improved my relationship with my partner					
23. Nudity / sex has improved my relationship with my family					
24. Nudity / sex has improved my relationship with my friends					

15. Do you use a Portable Digital Assistant / Palm Top / Palm Pilot at home?

Yes	No

16. What is the primary (most common) use of the Personal Digital Assistant / Palm Top / Pal Pilot (PDA) at home? Mark ONLY ONE item:

- ☐ I do not use the PDA at home
- ☐ For work / business / economic activities
- ☐ Entertainment and Recreation
- ☐ Education
- ☐ Social activities (such as e-mail and chat rooms)
- ☐ Other

Please specify :_____

17. How much time is invested in utilizing the PDA at home in hours per week?

- ☐ For work / business / economic / educational activities?
- ☐ For recreation / leisure / social activities?
- ☐ In total?

18. What are your opinions, if any, about violence, sex, nudity, pornography, and language exposure from games, movies and / or Internet usage in relation to your personal and social relationships?

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

19. What are your opinions, if any, about e-mail, blogs, chat rooms, Internet dating, match-making services, e-mail conversation, PC-games and / or information in general in relation to your personal and social relationships?

C. **CELL PHONE OWNERSHIP, FUNCTIONS, USAGE AND SOCIAL IMPACT**

20. Do you have access to a cell phone?

Yes	No

21. Which of the following functions does your cell phone have, if any? Mark all that apply (If you are unsure or do not know, LEAVE BLANK):

	SMS (Short message service) capability
	MMS (Media message service) capability
	WAP Internet connection
	GPRS Internet connection
	3G services and Internet connection
	Polyphonic ring tones
	True-tone ring tones
	MP3 / WMA player
	Radio
	Camera
	Video playback
	Video recording
	Video call functionality
	Hard-drive / upgradeable memory (RAM)
	Television
	PC-Game functionality
	Data transfer capability
	Memo / calendar / reminder functions

22. What is the primary (most common use of your cell phone? Mark ONLY ONE:

- ☐ Work / business / economic activities (via calls, SMS, MMS, e-mail, Internet, camera or sound)
- ☐ Social and family related accessibility (via calls, SMS, MMS, e-mail, Internet, camera or sound)
- ☐ Safety and emergency assistance
- ☐ Internet and data connectivity
- ☐ Entertainment and leisure (via camera, movies, games wall-papers, ring-tones or music)

23. How much time is invested in utilising your cell phone in MINUTES PER DAY (including calls, SMS, MMS, camera, sound, music, Internet, Internet shopping, e-mail, games, wall-paper and ring-tine downloads, memo / reminder / calendar functions, TV, video, video calls, conference calling, and / or data transfers?

24. What would you do with your time instead, in the absence of your cell phone?

25. Please mark the extent to which you agree or disagree with the following statements, with an "X" in the applicable box:

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Cell phones have improved my social life					
2. Cell phones are an invasion of privacy					
3. Cell phone calls are expensive					
4. Cell phones often disrupt my life					
5. I expect more from cellular technology in terms of functionality					
6. I spend too much time on my cell phone					
7. People around me complain about me using my phone					
8. I leave my phone ON in class, meetings, the movies, church, or interviews in case someone needs to get hold of me					
9. I will rather visit friends or family than phone them on their cell phones					
10. I sleep with my phone OFF					
11. Cell phones hamper my relationship with my partner					
12. Cell phones hamper my relationship with my friends					
13. Cell phones hamper my relationships with my family					
14. I would rather spend time on my cell phone than go out to see friends, family or a partner					
15. I sometimes do too little work because I am using my cell phone					
16. I have seen sex on my cell phone					
17. I have seen nudity on my cell phone					
18. Nudity and / or sex on my cell phone has improved my relationship with my partner					
19. Nudity and / or sex on my cell phone has improved my relationship with my friends					
20. Nudity and / or sex on my cell phone has improved my relationship with my family					

26. Please write down any comments in regards to cell phone's and / or relationships in the space below :

ATTACHMENT STYLE QUESTIONNAIRE

ADAPTATION OF EXPERIENCES IN CLOSE RELATIONSHIPS-REVISED
Designed by Chris R. Fraley

The statements below concern how you feel in emotionally intimate relationships. We are interested in how you *generally* experience relationships, not just in what is happening in a current relationship. Respond to each statement by marking the appropriate area to indicate how much you agree or disagree with the statement.

A. Please answer the following 10 questions about your MOTHER or a MOTHER-LIKE figure

1. It helps to turn to this person in times of need
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
2. I usually discuss my problems and concerns with this person.
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
3. I talk things over with this person.
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
4. I find it easy to depend on this person.
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
5. I don't feel comfortable opening up to this person.
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
6. I prefer not to show this person how I feel deep down.
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
7. I often worry that this person doesn't really care for me.
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
8. I'm afraid that this person may abandon me.
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
9. I worry that this person won't care about me as much as I care about him or her.
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
10. I don't fully trust this person.
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree

B. Please answer the following 10 questions about your FATHER or a FATHER-LIKE figure

1. It helps to turn to this person in times of need.	
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree	
2. I usually discuss my problems and concerns with this person	
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree	
3. I talk things over with this person.	
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree	
4. I find it easy to depend on this person.	
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree	
5. I don't feel comfortable opening up to this person.	
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree	
6. I prefer not to show this person how I feel deep down.	
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree	
7. I often worry that this person doesn't really care for me.	
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree	
8. I'm afraid that this person may abandon me.	
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree	
9. I worry that this person won't care about me as much as I care about him or her.	
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree	
10. I don't fully trust this person.	
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree	

C. Please answer the following 10 questions about YOUR DATING or MARITAL PARTNER. *Note*: If you are not currently in a dating or marital relationship with someone, answer these questions with respect to a former partner or a relationship that you would like to have with someone.

1. It helps to turn to this person in times of need.	
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree	
2. I usually discuss my problems and concerns with this person.	
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree	
3. I talk things over with this person.	
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree	
4. I find it easy to depend on this person.	
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree	
5. I don't feel comfortable opening up to this person.	
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree	
6. I prefer not to show this person how I feel deep down.	
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree	
7. I often worry that this person doesn't really care for me.	
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree	
8. I'm afraid that this person may abandon me.	
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree	
9. I worry that this person won't care about me as much as I care about him or her.	
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree	
10. I don't fully trust this person.	
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree	

D. Please answer the following 10 questions about YOUR BEST FRIEND

1. It helps to turn to this person in times of need.
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
2. I usually discuss my problems and concerns with this person.
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
3. I talk things over with this person.
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
4. I find it easy to depend on this person.
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
5. I don't feel comfortable opening up to this person.
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
6. I prefer not to show this person how I feel deep down.
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
7. I often worry that this person doesn't really care for me.
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
8. I'm afraid that this person may abandon me.
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
9. I worry that this person won't care about me as much as I care about him or her.
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree
10. I don't fully trust this person.
strongly disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ strongly agree

Thank you for your contribution to my master's dissertation. A summarised copy of the overall results of the study will be e-mailed to you, if you have given your email address, as a token of my appreciation for your participation.

Yours faithfully

Martin Schentke
(MA Research Psychology student – UNISA)

APPENDIX 7

ADDITIONAL FIGURES

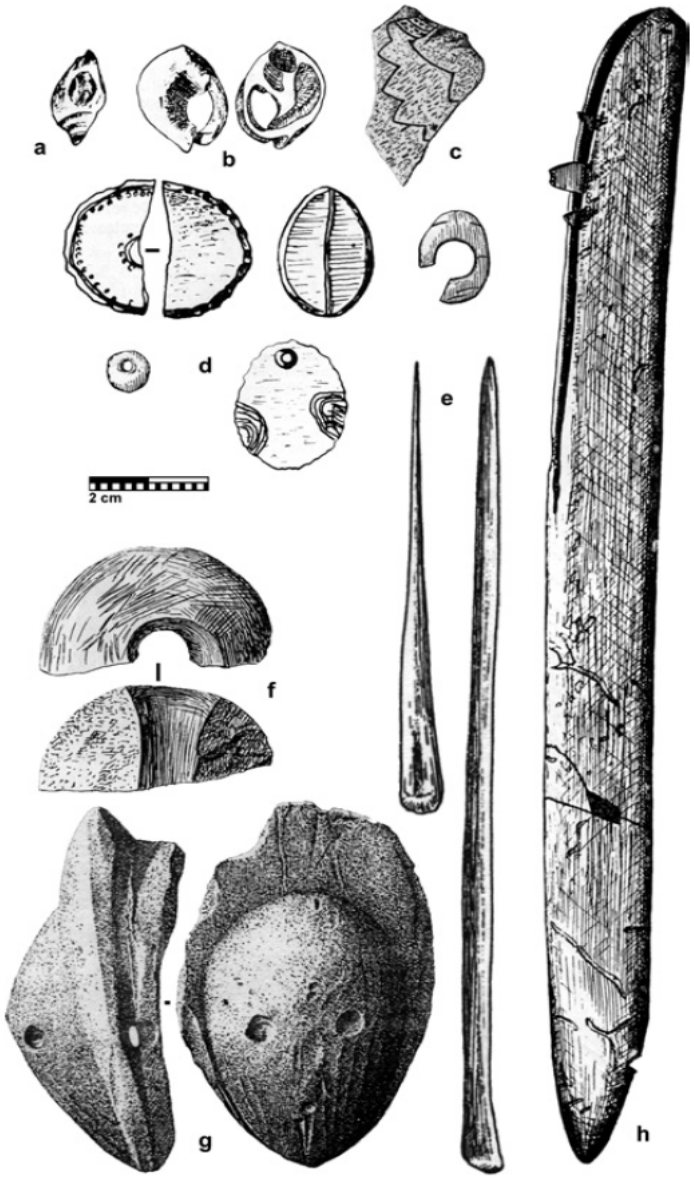

Fig. 1. Some characteristics of Capsian material culture other than flaked stone: (a) Perforated *Columbella*; (b) sliced *Nassa*; (c) fragment of engraved ostrich eggshell; (d) decorated pieces of ostrich eggshell; (e) bone tools; (f) fragment of a perforated stone sphere; (g) mask from El-Mekta; (h) sickle from Columnata (not to scale: 30 cm long). (From Camps-Fabrer, 1960, 1966; Gobert, 1912, 1951–52; Tixier, 1960).