THE COMBINED INFLUENCE OF NEW INFORMATION AND COMMUNICATION TECHNOLOGIES AND GENDER ON SELF-ESTEEM AND SOCIAL SUPPORT

BY

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ABSTRACT

New Information and Communication Technologies (NICT's) are developing into the primary source from which children interpret their world. Exploring and explaining how NICT's influences and impacts on different systems needs to be addressed. This study surveyed 435 male and 567 female students at 11 ex-Model C schools in the Cape Metropole. The survey instrument included a biographical questionnaire, the Social Support Appraisals Scale (SS-A) of Vaux, *et al.* (1986) and Rosenberg's (1965) Self-Esteem Scale. The results indicate that the gender gap is closing regarding most NICT's, while using NICT's moderately is preferable to excessive or no use. Moderate use of NICT's should thus be encouraged rather than the extremes of using these technologies excessively or not at all.

DECLARATION

The author hereby declares that this entire thesis, unless specifically indicated to the contrary in the text, is his own work.

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Z. Kafaar

DEDICATION

To my creator, for offering me the opportunities that very few members of my immediate and extended families have had.

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CHAPTER 1 INTRODUCTION

New entertainment and communication technologies' interaction with children have become key topics in modern social research. These technologies include audiovisual equipment such as television (TV), video and video gaming consoles, personal computers, cellular phones and the Internet. These and other similar equipment are referred to as new screen technologies or New Information and Communication Technologies (NICT's) (September & Savahl, 2003).

The rapid growth of these NICT's has significantly changed the current context of social society and has given rise to the international catchphrase 'universal access' (Scholtz & Steyn, 1998). Individuals are addressed as economic entities or technological consumers rather than citizens of national communities (September & Savahl, 2003). Children in particular are thought to influence the purchase of new media equipment including NICT's. Casas (2001) reports that children are influential when it comes to buying NICT equipment. This is especially evident in the purchase of personal computers (PC's). Similarly, Suess *et al.* (1998) found that households with children between the ages of six and sixteen possessed more recent models of media equipment than those with no children. It is therefore no surprise that Horner (1998) refers to children as 'surrogate salesmen' (p.5) especially with reference to NICT's.

Casas (2001) and Greenfield (1998) have argued that NICT's combined with changes in family structures (such as working moms, or children being raised by grandparents) are creating the opportunity for NICT's to become the prime socialization agents. Socialization refers to the "learning of information, cognitive processes, values, attitudes, social roles,

self-concepts and behaviours that are generally accepted, or expected within or in many segments" of societies (Berry & Mitchell-Kernan, 1982, p.62). This extremely complex process is further complicated when one considers that social norms are ever changing, inconsistent and even contradictory in our current context of a technological society (September & Savahl, 2003).

The three most influential socialization agents in modern society have traditionally been the family, school and television (Barthelmes, 1991). As new technologies, such as NICT's have been invented, these technologies have replaced TV as the third party in the three most influential socialization agents, whilst family has been seen as the most important socialization agent since time immemorial. It has been argued, however, that in our modern technological society NICT's are developing into the primary source from which children interpret their world (Barthelmes, 1991; Casas, 2001).

1.1 Rationale and Aims

Whether the use of NICT results in a deficit in social relationships or supplements these relationships has not been conclusively determined. Arguments for either of the aforementioned have been presented not only by parents but by researchers as well without any consensus being reached (Becker, 2000; Rheingold, 1993; Stoll, 1995; Turow, 1999). It is therefore the aim of this study to contribute to the further discourse on the effect of NICT use on adolescents. This study's primary aim is thus to assess whether gender interacts with the frequency of use of seven NICT's (viz. television, personal computers, the Internet, video console games, computer-based games, educative CD-ROM's and mobile telephones) to influence self-esteem and perceived social support from family and friends. The secondary aim of this study is to assess the degree to which gender and

frequency of use of these NICT's independently influences self-esteem and perceived social support from families and friends.

1.2 Significance

Casas (2001) contends that relevant research in the area of New Information and Communication Technologies is urgently needed. September and Savahl (2003) have identified the role that these new technologies play in children's socialization processes as well as issues pertaining to gender, culture and the interrelationships and communication between children and NICT as areas that demand urgent attention. This study will thus contribute to the broader literature on the effects that NICT has on adolescents. More particularly, this study will contribute to both the vast literature on self-esteem and social support as well as the emerging literature on the effects of NICT's on adolescents' lives.

1.3 Outline of thesis

Chapter 2 commences with a review of relevant literature, starting with a review of literature regarding adolescent use of new information and communication technologies (NICT's). This is followed by a review of the self-esteem literature, more particularly the influence of self-esteem on academic performance, gender differences in self-esteem, self-esteem in adolescence and the role of self-esteem in relationships. Literature regarding social support is reviewed next, starting with a contextualisation of social support for this thesis, followed by a review of studies reporting gender differences in network orientation, support network resources, supportive behaviours and support appraisals. The review of social support literature culminates with a review of the literature regarding social support

in adolescence. Chapter 2 concludes with a description of the theoretical framework within which this study locates itself.

Chapter 3 describes the methodology used in this thesis by outlining the sample, procedure, instruments used, hypotheses and data analysis used.

Chapter 4 reports the results of the thesis, delineated by the type of NICT. Each NICT is reported on in terms of the results obtained for both the crosstabulation and the general linear model analyses, the latter further stratified into gender differences and frequency of use differences. Chapter 4 concludes with a summary of the crosstabulations and the general linear model for all of the NICT's and an overall summary of the results.

Chapter 5 discusses the results obtained by discussing each of the NICT's individually and concludes with limitations and recommendations for further research.

CHAPTER 2 LITERATURE REVIEW

2.1 ADOLESCENT USE OF NEW INFORMATION AND COMMUNICATION TECHNOLOGIES (NICT's).

Use of the Internet amongst teenagers has increased exponentially in the last ten years. Concomitantly, concern over the effect of Internet usage on the psychological well-being of teenagers has been raised (Becker, 2000). In a study conducted in the United States of America in 1999, almost two thirds of the more than 1000 parents surveyed were concerned that 'going on-line too often may lead children to become isolated from other people' whilst 40% agreed with the statement that 'children who spend too much time on the Internet develop antisocial behaviour' (Turow, 1999).

Research projects conducted to verify or disclaim these popularly held beliefs have been inconclusive. Certain authors have argued that the use of information and communication technologies such as the Internet for example, results in social isolation (Stoll, 1995). These authors contend that the use of these technologies leads to communication through a socially depleted medium and results in users who are severed from genuine social relationships (Stoll, 1995; Turkle, 1996). Arguments to the contrary have been raised by authors such as Katz and Aspden (1997) and Rheingold (1993). They argue that the use of these communication technologies leads to greater quantity and quality of social relationships. This, they argue, is due to the liberating aspect of these communication technologies. People are no longer constrained by geographical location, stigma, illness or time constraints. These technologies allow people to communicate with whom they want

and when they want, based on common interest rather than convenience or proximity (Gross, Juvonen, & Gable, 2002; Katz & Aspden, 1997; Rheingold, 1993).

A longitudinal study conducted by Kraut *et al.* (1998) argues for the former and report that using the Internet for as little as 3 hours per week led to increased levels of depression, and reductions in social support over the course of the 2-year study. Furthermore, teenagers were reported as the most vulnerable group to these negative effects. Kraut *et al.* (1998) surmised that adolescents who made frequent use of the Internet for on-line communication resulted in the relinquishing of critical bonds with local friends and family for weak relations with strangers.

In their application of their findings to the adolescent population Kraut *et al.* (1998) have been criticized in two areas. The first area raises concerns about the absence of a control group. Larson (1999) argues that as children proceed through adolescence there is a steady decrease in perceived social support and overall contentment. Since Kraut *et al.* (1998) did not make use of a control group, it is impossible to tell whether the decline in social support they report is in fact due to the use of the Internet or whether it is due to the effect described by Larson (1999). The second area of criticism deals with the fact that Kraut *et al.* (1998) did not collect data to determine with whom and about what adolescents were communicating on the Internet. Supportive peer relationships are of immense importance to healthy adolescent development (Hartup, 1996). Thus if adolescents in Kraut *et al.*'s (1998) study were communicating with their peers and were talking about everyday life, Hartup's (1996) argument would be refuted. Conversely, if they were communicating with strangers, Hartup's (1996) argument would be strengthened.

The fundamental need to form and maintain strong interpersonal bonds has been well-documented (Baumeister & Leary, 1995). Feeling close and connected to others on a daily basis has been shown to be associated with higher daily well-being in adolescents. More particularly, feeling understood and appreciated as well as sharing pleasant interactions have been shown to be significantly strong predictors of well-being in adolescents and adults (Reis, Sheldon, Gable, Roscoe & Ryan, 2000).

Reis and Shaver (1998) argue that the development and sustaining of intimacy is mediated by pleasant interactions and feelings of being understood (i.e. social exchanges with responsive others). Buhrmester and Furman (1987) posit that during late childhood or early adolescence, an expectation of intimacy in peer relationships develops. This expectation and concomitant meanings of friendships are constant throughout adolescence and adulthood. Close and meaningful interactions with peers are thus likely to be just as important to adolescent well-being as adult well-being (Gross *et al.*2002). Hartup (1996) argues that close peer relationships contribute positively to self-esteem in adolescents. Conversely, relationship problems with peers such as rejection by peers and a dearth of close friends are some of the strongest predictors of negative self-views and depression (Hartup, 1996). It is thus evident from the above that the use of NICT's can either promote or hinder well-being, depending on whether it replaces or supplements opportunities to meaningfully communicate with close peers.

Gross *et al.* (2002) contend that two characteristics of communication technologies such as the Internet are important to our understanding of the nature of peer relationships and social exchanges. The first is the development of synchronous online interaction with people you know. An example of such a synchronous media is instant messaging, which allows for alerts to users when their friends are online. The friends can then chat through a

text window that appears on both computer screens. Instant messaging is comparable in structure and function to other important and prevalent means of social interaction in adolescents such as 'hanging out' face to face and speaking on the telephone in that it is dyadic, happens in real time and is usually private (Gross *et al.* 2002). This has been confirmed by Lenhart, Rainie and Lewis (2001) who report that a fifth of American teenage Internet users use instant messaging as the primary means of contacting friends.

The second characteristic identified by Gross *et al.* (2002) is that more adolescents from middle- and upper-income homes are accessing the Internet from home than ever before. These adolescents are therefore increasingly likely to find their close off-line friends online too, and would therefore not have to relinquish their school-based relationships when they use the Internet. They would thus be able to communicate socially with geographically distant friends and strangers as well as augment their established close relationships (Gross *et al.* 2002).

Subrahmanyam, Kraut, Greenfield and Gross (2000) argue that communications with strangers and acquaintances online represent weak social ties that generally provides less social support than offline relationships with family and friends. Participants in the Subrahmanyam, *et al.* (2000) as well as the Parks and Robert (1998) study reported feeling less close to those they communicated with online compared to those they communicated with face-to-face. Participants in both studies further reported investing less time in their online relationships and that these relationships tended to be more short-lived than their offline relationships. Whilst strong relationships can be made online, these tend to require revealing one's offline identity and further reinforcement by meeting face-to-face (McKenna & Bargh, 1998).

In a study of computer usage patterns and frequency, Ho and Lee (2001) found that even though girls and boys spent equal amounts of time using computers, girls spent significantly more time on computers doing homework, surfing the Internet and communicating with others. Boys on the other hand spent significantly more time than girls playing computer games. Ho and Lee (2001) report further that those who used computers reported engaging in more exercise, recreational and relaxation activities than those who did not use computers. They also reported significantly higher perceptions of social support than non-users.

The above literature is in no manner conclusive. Arguments for the benefits as well as the drawbacks of NICT use have been put forth. Results from various studies contradict one another while different authors, depending on which argument they support, interpret their results in a manner favourable to their argument. The jury is thus still out as to whether NICT's are beneficial or detrimental to adolescents.

2.2 SELF-ESTEEM

2.2.1 Introduction

Baumeister, Campbell, Krueger & Vohs (2003) argue that self-esteem can literally be defined as the value that individuals place on themselves. Similarly, Harter (1993) defines self-esteem as the amount of regard one has for oneself as a person. As such, self-esteem can be viewed as the evaluative aspect of self-knowledge. Whereas low self-esteem can be

seen as an unfavourable evaluation of oneself, high self-esteem is seen as a highly favourable global evaluation of oneself.

There is, however, no requirement for one's evaluation of oneself to be accurate. Thus high self-esteem could be a balanced and justified evaluation of one's worth or an inflated and arrogant sense of one's superiority over others. Similarly, low self-esteem could be an accurate, well-founded evaluation of one's shortcomings or an unrealistic distortion of one's worth due to a sense of insecurity or inferiority (Baumeister, *et al.*, 2003). One could thus enhance one's self-esteem through viewing one's strengths as unique and rare while at the same time minimising one's weaknesses as common to everyone (Goethals, Messick & Allison, 1991).

Self-esteem is therefore one's subjective perception rather than an objective, realistic appraisal of one's self-worth. While self-esteem pertains to individuals' beliefs of whether they are intelligent and well-liked, for example, self-esteem is not an accurate reflection of whether this is indeed so (Baumeister, *et al.*, 2003). This begs the question whether there is any benefit to studying self-esteem at all if it has no basis in reality. The answer is a resounding "Yes!" since it is individuals' beliefs that shape their actions and it is their actions that shape their social reality as well as the social reality of the individuals around them (Rosenthal & Jacobson, 1968). Much of the research around self-esteem has revolved around the protection and enhancement of self-esteem (Baumeister, *et al.*, 2003). Within the psychodynamic literature, research has shown that defense mechanisms that Freud had understood as ways of keeping menacing sexual and aggressive impulses at bay serve as strategies to boost self-esteem (Baumeister, Dale & Sommer, 1998).

Harter (1993) described the findings of several studies that explored the correlation between self-esteem and self-rated physical attractiveness and reported that the correlation was .85. This indicates a very strong relationship, with individuals' physical attractiveness accounting for more than 70% of the variance in their self-esteem.

Given that self-esteem is one's subjective perception rather than an objective, realistic appraisal of one's self-worth, one could suggest that all that is needed is that individuals should start thinking that they are better. However, we all have to cope with reality and are thus motivated to perceive ourselves accurately while admitting our undesirable characteristics (Swann, Stein-Seroussi, & Giesler, 1992). Even though we would like to objectively know whether we are good or not, we much prefer to learn positive things about ourselves than negative things (Sedikides, 1993). These positive things have, however, to be grounded in some form of objectivity.

2.2.2 Self-esteem and Academic Performance

In a meta-analysis of 128 studies involving more than 20 000 participants, Hansford and Hattie (1982) explored a variety of self-esteem measures and a range of objective performance tests, largely achievement tests. Hansford and Hattie (1982) report average correlations between +.21 and +.26 and conclude that there is an overall significant positive relationship between self-esteem and academic performance where self-esteem accounts for four to seven percent of the variance in academic performance. Similarly, Kugle, Clements and Powell (1983) found that self-esteem correlated significantly with a reading achievement test and Simon and Simon (1975) reported that self-esteem correlated significantly positively with scores on academic achievement tests as well as with IQ test scores. Later studies have produced similar results. Davies and Brember (1999) report

significant positive relationships between self-esteem and academic performance in a large British sample while Bowles (1999) demonstrated that self-esteem correlated significantly with recent semester grades in English and Mathematics.

It would be pertinent at this stage to recall that correlation does not indicate causality. The case can be made for either direction of causality; that high self-esteem leads to high grades or that high grades leads to high self-esteem (Baumeister, *et al.,* 2003). In a study that purposefully used academic grades that were acquired before the researcher measured self-esteem, Bowles (1999) found a positive relationship between self-esteem and academic grades. Bowles' (1999) study thus supports the conclusion that self-esteem is a result and not a cause of performing well at school. The above conclusion was further supported by path analysis that indicated no direct causal path from self-esteem to achievement.

In an earlier longitudinal study Bachman and O'Malley (1977) tracked 1600 men for eight years. Participants were asked to complete a modified version of the Rosenberg (1965) self-esteem scale at a number of points in the study. Bachman and O'Malley (1977) found that self-esteem correlated with school performance even though their path analysis did not indicate any causal role for self-esteem. They further concluded that success at work caused self-esteem to rise while obtaining a higher education had a negligibly small impact on self-esteem. However, Bachman and O'Malley (1977) did report that self-esteem in high school did predict the eventual level of educational achievement or degree obtained.

2.2.3 Self-esteem and Gender

Cross and Madson (1997) argue that factors that predict self-esteem depends on whether the individual has an independent or interdependent self-construal. An independent self-construal is where individuals' representations of themselves are delimited by and differentiated from representation of other individuals or their social contexts (Geertz, 1973). An interdependent self-construal on the other hand emphasizes the interrelatedness of the individual and society, where individuals' representations of themselves are interlaced with the representation of significant others such as spouses, immediate family members and close friends (Markus & Kitayama, 1991). Sampson (1988) argues that the independent self-construal best describes the views males have of themselves while the interdependent self-construal best describes females' view of themselves.

Given the above, Cross and Madsen (1997) argue that gender differences in self-esteem are a result of the different types of self-construals men and women have. Stein, Newcomb, & Bentler (1992) used a measure similar to interdependence in order to predict self-esteem. Their results show that the interdependence measure predicts self-esteem as much as two years later for women but not for men. Similarly, Feather (1991), using a measure similar to independence, was able to predict later self-esteem for men but not women.

Alternative arguments have explained the differences in self-esteem between men and women in terms of gender roles, cultural emphasis on women's physical appearance and the effect of schools. Several researchers have reported that masculinity scores are positively correlated with self-esteem (Marsh, 1987; Orlofsky & O'Heron, 1987) while femininity scores show smaller less consistent relationships with self-esteem (Whitley, 1983).

The emphasis placed on girls' and women's physical appearance in certain cultures have also been posited as contributing to gender differences in self-esteem. While perceptions of one's attractiveness are correlated with self-esteem for both males and females (Feingold, 1992; Harter, 1990) women and girls consistently report less satisfaction with their bodies and appearance than boys and men (McDonald & Thompson, 1992; Wood, Becker & Thompson, 1996). Furthermore, concerns regarding appearance and weight have been argued to have a greater damaging effect for girls' self-esteem since perceptions of physical attractiveness have a greater association with self-esteem for girls than for boys (Allgood-Merten, Lewinsohn & Hops, 1990).

Within the school setting, teachers have been shown to interact more frequently with boys than girls while giving boys more specific and helpful feedback (Golombok & Fivush, 1994; Sadker & Sadker, 1994). Concomitantly, teachers generally attribute boys' academic failure to motivational problems while girls' academic failures are attributed to lack of ability (Kling, Hyde, Showers & Buswell, 1999). The net result in the classroom is that girls are silenced and thus become silent in the classroom (Orenstein, 1994). While teachers may be committed to equality in the classroom, these subtle patterns of interaction of which teachers may be unaware gradually undermine girls' sense of competence (Sadker & Sadker, 1994). The American Association of University Women (1990) conducted a study with 3000 adolescents in an attempt to examine potential factors that could contribute to gender differences in self-esteem during adolescence. The study focussed on attitudes toward the self, family, friends and school. The results of this study indicated that during adolescence girls' self-esteem plummeted. This decrease is attributed to subtle sexism in the classroom that takes various forms, ranging from presenting boys with higher quality education to choosing boys over girls when questions needed to be

answered in front of the class and then giving them more time to prepare their response (American Association of University Women, 1990).

2.2.4 Self-esteem in Adolescence

Block and Robins (1993) report that boys' self-esteem increases while girls' self-esteem decreases during adolescence. Explanations for this lowering of self-esteem in girls during adolescence generally tend to focus on the impact of puberty on physical development (Kling, *et al.*, 1999). As mentioned above, self-esteem is strongly correlated with self-perceived physical attractiveness. However, during adolescence physical maturation for girls and boys are different. Whereas boys gain more muscle mass, girls tend to gain more body fat. Concomitantly, girls' and boys' attitudes to their attractiveness change. While boys' perceptions of their attractiveness remains relatively constant, girls experience a steady decline (Harter, 1993). Furthermore, Cohn, Adler, Irwin, Millstein, Kegeles and Stone (1987) have shown that early adolescent girls aspire to an ideal body type that is smaller than theirs while boys aspire to an ideal body type that is larger than their own. The experience of puberty therefore drives girls away from their ideal body type while at the same time bringing boys closer to their ideal body type. A further contributing factor to the decrease in self-esteem for girls during adolescence is that adolescence brings with it heightened self-consciousness which could emphasize the difference between their ideal and perceived body types (Harter, 1990).

2.2.5 Self-esteem and Relationships

Whilst taking cognisance of studies reported earlier, which indicated that self-reports are not the most reliable measures of objective reality, individuals with high self-esteem rate themselves as being more popular with others than individuals with low self-esteem (Battistich, Solomon & Delucchi, 1993). Individuals with high self-esteem also rate their friendships as being of a higher quality than individuals with low self-esteem (Keefe & Berndt, 1996) while those with low esteem report a greater number of negative aversive social exchanges and stressful life events as well as less social support than individuals with high self-esteem (Lakey, Tardiff, & Drew, 1994). Frone (2000) reports similar results in the workplace, where individuals with high self-esteem report that they get along better with their co-workers than those with low self-esteem. It would thus seem that that individuals with high self-esteem have a richer and more satisfying social life than individuals with low self-esteem.

In order to test this, Buhrmester, Furman, Wittenberg, and Reis (1988) examined a variety of interpersonal behaviours in a sample of adult college students. All students rated themselves but were also rated by their roommates, offering the opportunity to compare subjective and external perspectives. Individuals with high self-esteem rated themselves as significantly better on interpersonal skills such as initiating relationships, asserting themselves, providing emotional support to others, disclosing things about themselves and managing interpersonal conflict than other individuals. When the roommates' ratings were correlated with the self-report ratings however, only initiating relationships indicated a significant correlation. The findings indicate that even though individuals with high self-esteem regard themselves as having a wide range of exceptional social skills these skills

are not easily determined by others. The only skill recognised by roommates (initiating relationships) indicates one area in which confidence could come into play. Individuals with high self-esteem who think they are attractive and desirable could be more willing to initiate conversations with strangers because they do not expect rejection. Conversely, individuals with low self-esteem might steer clear of such interactions (Buhrmester, *et al.*, 1988).

2.3 SOCIAL SUPPORT[1]

2.3.1 Introduction

Vaux (1988) argues that even though much progress has been made with regards to the synthesis of Social Support theory, the concept of Social Support (SS) has relevant processes that are complex and existing models and theories are not convergent. In his later work Vaux (1990) says that most conceptual difficulties with SS can be lessened or even resolved if one views SS as a metaconstruct. A metaconstruct is defined as a higher level construct, composed of constructs (Stewart, 1989). Thus in the case of the metaconstruct of SS, Vaux (1990) argues that it comprises three conceptual components or constructs, viz.: a) support network resources; b) supportive behaviours; and c) subjective appraisals of support.

Support network resources can be viewed as those sets of relationships in which an individual receives or gives support and help in dealing with the demands of everyday life as well as working towards goals. These networks invariably differ in size, make up, structure, the diversity of experience of the network members and the quality of the relationships between members of the network (Orth-Gomer & Unden, 1987; Vaux, 1990).

Support behaviours include those acts one would generally recognize as premeditated acts intended to help someone. Examples of types of supportive behaviour include, but are not

[1] Much of the literature regarding social support was written in the heydays of social support from the early 1980's to the early 1990's. As a result, this section of the literature review might seem slightly dated.

limited to, emotional, practical and material support, guidance, comforting, loaning money, feedback and socializing (Barrera Jr. & Ainlay, 1983; Vaux *et al.* 1986; Vaux, 1988).

Appraisals of support, in contrast to network resources and behaviours, are subjective estimations by individuals of the extent of their network resources and the quality of support behaviours received from the relationships within the network (Vaux, 1990). Instruments designed to measure appraisals of support have focussed on satisfaction with support received (Barrera Jr., 1981; Hirsch, 1980), individuals' perceptions of the quality and availability of support (Procidano & Heller, 1983) and individuals' beliefs that they are 'cared for, respected by, and involved with family, friends, and others (Vaux, *et al*, 1986).

The abovementioned components of SS are not constant, unchanging attributes of individuals or their environments. In contrast, they are reflections of the dynamic, ever-changing transactions between individuals and their social support networks. Thus a larger more diverse network might be more helpful in providing information and/or instrumental assistance as well as ease facilitation of transactions than a smaller less diverse network (Lin, 1986).

2.3.2 Context

What happens during a support incident is important in establishing positive appraisals of support. In support incidents where it may appear that the support network member rendering support is doing so reluctantly or is rendering the wrong mode of support or the support received is too little too late (or even too much too early), the individual's appraisal of the support event could be negative. Other contextual factors such as mode of communication could also impact negatively on the appraisal of the support. To illustrate

the above consider that the support might be given in a public place where there is no privacy to express emotion or discuss the problem further, non-verbal cues might not be available in conversations mediated through technology such as telephones and Internet chat-rooms and there might not be adequate time to explain and explore the problem and the accompanying emotions fully (Vaux, 1990).

Vaux (1990) further argues that appraisals of support might be the most influential factor contributing to well-being. Perceptions of the adequacy of support or satisfaction with support has been shown in several studies to have a stronger relationship to distress or well being than size or composition of support networks (Barrera, 1981; Hirsch, 1980; Procidano & Heller, 1983; Sarason, Levine, Basham & Sarason, 1983). Barrera (1981) states that:

> "…knowledge of people's subjective appraisals of the adequacy of support is more critical to the prediction of their well-being than simply collecting information about the number of supporters or the quantity of supportive behaviours to which they have access." (p.85)

Several authors have agreed with the above-mentioned statement that it is the person's subjective experience of the supportive act or relationship rather than the actual event or relationship itself that is most influential (Heller & Swindle, 1983; Turner, Frankel & Levine, 1983; Vaux *et al.*, 1986). Vaux (1988) asserts that this viewpoint has been argued since the earliest of times and quotes the Roman philosopher Epictetus who lived 2000 years ago "Men are disturbed not by things, but by the views which they take of things." Turner, Frankel and Levine (1983) contextualised this argument within the discipline of psychology by stating that the events or circumstances in the real world within which

individuals find themselves only influence individuals in the form and to the extent to which these individuals perceive them. Turner *et al.* (1983) further argue that social support is best viewed as subjective experience rather than objective circumstances or processes.

2.3.3 Social Support and Gender

Inasmuch as gender is a fundamental dimension of most societies, men and women continue to live in different social contexts, sometimes dramatically so. Generalizations of masculine and feminine roles imply that men and women interact differently in a manner that has implications for SS (Vaux, 1988).

In general, differences in sex-role characteristics between men and women should facilitate the support process in women while impeding it in men. Whereas feminine sex-role characteristics include the development and maintenance of supportive relationships while at the same time providing and receiving support, masculine sex-role characteristics include reluctance to look for help from others or to show vulnerabilities (Burda & Vaux, 1987). Bell (1981) elucidates this further by stating that women emphasize intimacy and self-disclosure in their relationships and have more close friends than men. Men, conversely, emphasize sociability (Bell, 1981).

2.3.3.1 Gender Differences in Network Orientation

A qualitative study conducted by Tolsdorf (1978) cited in Vaux (1988) found that double the number of men as opposed to women had a negative network orientation i.e. a disinclination to use support resources due to independence, mistrust, or beliefs that others will not be able to help. Various studies have shown that a negative network orientation

hampers the development, maintenance and utilization of support resources which in turn has a negative effect on well-being (Tolsdorf, 1976; Vaux, Burda & Stewart, 1986; Vaux & Wood, 1987).

The abovementioned difference with regards to utilization of network support resources seem to be evident before adulthood. Burke and Weir (1978) examined twelve specific problems teenagers would feel free to discuss with their sources of support by assessing the willingness of teenage boys and girls to tell mothers, fathers and peers if they were having a bad day or a problem. Their findings show that there are no gender differences with two exceptions. Girls felt less free than boys to discuss problems with their fathers and were also more likely than boys to tell peers when they were having a bad day. Girls also felt freer than boys to discuss a wider range of problems with peers (Burke & Weir, 1978).

The negative network orientation of men is not only constant from adolescence to adulthood and even into late adulthood, but seems to be evident across time. Depner and Ingersoll-Dayton (1985) conducted a study similar to that of Lowenthal and Haven (1968) and reported similar results to the study that had been conducted almost twenty years prior to theirs. While Lowenthal and Haven (1968) reported that husbands cited wives most often as confidantes as opposed to wives who cited husbands least often, Depner and Ingersoll-Dayton (1985) reported that wives were more likely than husbands to report that they received less support than what they provided.

It is thus evident that most of the research regarding network orientation concur that women generally have a more positive orientation to their network resources and are thus more willing to make use of the resources available in their support network. Men,

however, are more reluctant to ask for help as this could be misconstrued as weakness or dependence on their part.

2.3.3.2 Gender Differences in Support Network Resources

A number of studies have attempted to determine whether gender differences exist in terms of support network resources. McFarlane, Norman, Streiner and Roy (1983) report that in comparison to men, women have access to larger networks of people whom they could discuss problems with in various domains of their life. However, within the context of parents who are expecting the birth of a child, Cronenwett (1985) reports slightly different results in that support network resources for expectant parents were comparable between men and women on a number facets, except for emotional support. Expectant women reported receiving more emotional support overall as well as more emotional support from friends than their partners (Cronenwett, 1985). Stokes and Levin (1986) report that the social networks of men and women attending tertiary institutions did not differ in terms of size (the number of people in the network), density (how many of the network members knew each other independent of the central person) or number of close confidantes. However, when they assessed older students attending evening classes, they found that women reported larger networks than men and had a larger number of confidantes.

Differences in the above findings leads one to question whether the differences might be due to different measurement instruments and/or samples or even due to the differing levels of importance sex-roles play in each of these samples. Gender differences that reflect the above were reported by Fischer (1982). Whilst neither gender was at an advantage compared to the other, young women with children, married men and older men were less likely to have support resources outside of the home (Fischer, 1982). The

incongruent findings can thus be seen to be a result of confounding variables not accounted for within the research on support network resources.

2.3.3.3 Gender Differences in Supportive Behaviours

Various authors have examined gender differences in supportive behaviours. It would be pertinent at this point to clarify the distinction between availability of supportive behaviour and enacted supportive behaviour. The former is a measure of how likely, based on previous experience, a family member or friend would be to render support within a specific context while the latter is a measure of how frequently in the past individuals have received specific supportive behaviours (Barrera, Sandler & Ramsay, 1981: Vaux, Riedel & Stewart, 1987)

Vaux's (1985) research found that even though male and female students reported similar levels of availability of supportive behaviour from family, female students reported significantly more availability of support behaviour from friends. This included greater availability of support for guidance, advice and emotional support (Vaux, 1985).

In a comparison between male and female college students on enacted supportive behaviour, Stokes and Wilson (1984) found that even though the overall level of supportive behaviour was not dissimilar, women reported receiving more emotional support than men. As mentioned earlier, Stokes and Levin (1986) conducted research with an older sample of students attending evening classes. Their results show that women receive more supportive behaviour than men.

The research detailed above thus seems to indicate consensus that women have access to more supportive behaviours than men, in particular more emotionally supportive behaviour.

2.3.3.4 Gender Differences in Support Appraisals

As mentioned earlier, several authors have agreed that it is the person's subjective experience of the supportive act or relationship rather than the actual event or relationship itself that is most influential (Heller & Swindle, 1983; Turner *et al.* 1983; Vaux *et al.*, 1986). Evidence suggests that appraisals of support are most closely linked to well-being (Barrera, 1981; Hirsch, 1980; Procidano & Heller, 1983; Sarason *et al.* 1983). However, research on gender differences concerning appraisals of support is disparate.

Holahan and Moos (1983) conducted research with a large community sample of adults with regards to family and work support. Whilst no statistical differences were calculated, the support from family and work seems equivalent for men and women. Ensel (1986) reports on strong-tie support (a measure of the individual's appraisal of the sufficiency of close social resources) based on epidemiological data. Once again, statistical comparisons were not performed. However, comparisons of the means of strong-tie support for males and females indicate similar levels of overall strong-tie support and comparable levels for each of the five marital status groups in the study (Ensel, 1986). Turner and Wood (1985) report similar results in that comparable levels of support appraisals for men and women were found in their large sample of disabled persons. In a further examination of gender differences in levels of support, Fusilier, Ganster and Mayes (1986) report that perceived support from spouse, friends and relatives, immediate supervisor and other people at work

were all unrelated to gender, with the exception that women reported more support from their supervisors than men.

On the other end of the continuum of research on support appraisals, Hirsch (1979) found that women were less satisfied with obtained levels of support. This finding is interesting in the light of the fact that the same sample of women also reported a higher level of emotional and socializing support than the men. Hirsch (1979) puts forth that this anomaly could be explained by either the quality of the support received by women or that the expectations of support were higher for women than men. In opposition to this, Burke and Weir (1978) report that teenage females in their sample were more satisfied than males with support from peers while support from parents were similar.

Cauce, Felner and Primavera (1982) assessed social support among a sample of predominantly low-income, inner city high school students by asking their participants to rate the helpfulness of various people. Factor analysis of their responses yielded three factors viz. parents and relatives (Family), teachers and other formal sources (Formal) and age peers and other adults (Informal). The former two indicated no difference with regards to gender. However, the results for age peers and other adults (Informal) indicated that girls reported more informal support than boys. Further analysis revealed two interesting distinctions. Firstly, younger males and older females reported greater formal support than older males and younger females respectively. Secondly, formal support was greater for males than females in the white and black groups but greater for females than males in the hispanic group. There was thus a clear gender distinction with regards to Informal support, while formal and family support showed complex gender differences with ethnicity and age respectively (Cauce *et al.* 1982).

In summary, gender differences in appraisals of support are most evident in the peer domain. Furthermore, girls' appraisals of support are higher than boys' in adolescence, potentially reverse during late adolescence/ early adulthood and are equivalent during adulthood.

2.3.4 Social Support in Adolescence

Supportive relationships with others have been conceptualized as a resource that promotes successful adaptation during adolescence (Compas, Hinden & Gerhardt, 1995; Sandler & Twohey, 1998). The at-times testing range of social, cognitive and biological changes that are evident in adolescence and more so in early adolescence could introduce changes to the levels and configurations of these relationships (Lerner *et al.* 1996). The vast array of external support types that adolescents receive at this stage, ranging from tangible assistance with practical concerns such as homework to having someone listen to and validate feelings are valuable in helping adolescents avoid emotional difficulties (Cauce, Mason, Gonzales, Hiraga & Liu, 1996; Sandler, Miller, Short & Wolchik, 1989).

Wall, Covell and Macintyre (1999) extends the above argument further by arguing that social support facilitates successful transitions through adolescence. Adolescents with adequate social support have been shown to be less vulnerable to stress (Dubois, Felner, Meares & Krier, 1994) and depression (McFarlane, Bellissimo & Norman, 1995). Social support has also been shown to increase the likelihood of academic achievement (Levitt, Gaucci-Franco & Levitt, 1994).

In their seminal work, Douvan and Adelson (1966) describe differences in friendships in early, middle and late adolescence. In early adolescence, friendships are focussed on

shared activities as opposed to personality. They argue that even though early adolescents do look for certain characteristics in friends, these tend to be superficial e.g. not being selfish, grouchy, a showoff or mean. During middle adolescence friendships involve greater emotional interdependence. The importance of emotional support, confiding, understanding and loyalty increases in this stage of adolescence. Finally, in late adolescence, there is a greater acceptance of friends' individuality and uniqueness while the importance of emotional support continues. Difference is no longer seen as a threat to identity but rather as an opportunity to offer a new perspective (Douvan & Adelson, 1966).

Notwithstanding the fact that peers become increasingly important in adolescents' lives, family members remain important (Vaux, 1988). Blyth, Hill and Thiel (1982) conducted research with adolescents in which these adolescents were asked to nominate people they considered to be most significant to them. Even though an age peer who was not related to the participant was the most common type of significant person identified, adults and particularly family members remained important.

Hunter and Younis (1982), in their study of white middle class American youth from the Washington D.C. area, examined three aspects of relationships. These were direction and disagreement (i.e. control), meeting needs and getting help (i.e. nurturance) and sharing problems and understanding (i.e. intimacy) in terms of three relationships, the relationship with the participants' mother, father and best friend. Their sample was stratified into four age groups with means of nine, twelve, fifteen and nineteen years of age. Hunter and Younis (1982) report considerable change in relationships with age. Parental attempts to control were greater than friends' attempts to control across all age groups while friends' attempts to control were higher for twelve and fifteen year olds than for either the nineteen year old or nine year old age groups. One of the findings of this study is that both

nurturance and intimacy were lowest for friends in the nine year old sample, but increased such that the levels for nurturance and intimacy were at similar and greater levels respectively, to parents within the fifteen year old group. Gender differences that were reported was that females reported greater intimacy in friendships than males while males (but not females) saw fathers as more nurturant than mothers.

In the study of Cauce *et al.* (1982) measuring support appraisals of the helpfulness of three factors, Family, Formal and Informal support, the index of support for Formal and Informal support (i.e. the combination of these two modes of support) increased with increases in age, while Family support increased for females but decreased for males. It is thus evident from these findings that an expansion of support from sources outside of the family occurs for both males and females during their transition from early adolescence (around fourteen years of age) to middle adolescence(approximately sixteen years of age) (Cauce *et al.* 1982).

Social support from peers neither replaces nor competes with social support from parents. These different sources of support complement each other with either one not being able to replace the other (Wall, Covell & MacIntyre, 1999). However, as indicated above, peer support does become increasingly important as the individual progresses through adolescence. Since parent and peer support correlates with self-worth (East & Rook, 1992) and the two types of support are used differentially (Windle, Miller-Tutzave & Barnes, 1991) both are needed by adolescents. Whereas peers provide support for the everyday life of adolescents in terms of leisure activities, hairstyles, friendships and dating, parents continue to be the most significant source of support for long-term lifestyle choices such as careers and personal values (Jurkovic & Ulrici, 1985; DuBois *et al.* 2002). The complementary nature of these two sources of support to adolescents is illustrated in the

study conducted by Dunn, Putallaz, Sheppard and Lindstrom (1987). These researchers studied aspects of social support during the transition to a new school. Whereas peer support predicted the affective aspects of the transition in terms of levels of anxiety and depression, family support predicted the behavioural aspects of the transition in terms of grades and attendance at school. It is thus evident that a successful transition and adaptation to the new school was dependent on both sources of support inasmuch as they were mutually reinforcing.

2.4. THEORETICAL FRAMEWORK

In locating this thesis within a theoretical framework, the following quotation is relevant:

> 'Social support is best viewed as a complex process unfolding in an ecological context' (Vaux, 1990; p.507)

Given the above, this research is placed within Bronfenbrenner's (1989) ecological systems theoretical framework.

Bronfenbrenner (1986) argues that one needs to consider four interacting dimensions in attempting to understand individuals in context. These dimensions, as explicated by Dawes and Donald (2000) are:

1. Person factors such as temperament or self-esteem
2. Process factors such as the forms of interaction process occurring in family or school settings
3. Contexts such as families or peer groups
4. Changes over time in the characteristics of the individual or the environment.

Dawes and Donald (2000) further argue that the person, process and context elements change over time as the individual matures and the environment changes.

Researchers as long ago as Muus (1988) argued that research should attempt to understand how youth are adjusting to their constantly changing yet interrelated social and cultural environments. Bronfenbrenner (1989) contends that in order for research to capture the

complexity of a phenomenon, research designs should attempt to include several contexts. Bronfenbrenner (1989) thus posits four major systems that represent the context for development viz. the microsystem, mesosystem, exosystem and macrosystem. These levels of context interact with each other whilst at the same time affecting the individual (Lloyd, 2002).

2.4.1 Microsystem

Bronfenbrenner (1989) describes the microsystem as the immediate setting within which the individual is found. This is the system within which the individual and the environment interact. As such, the microsystem is the level of context closest to the individual.

Dawes and Donald (2000) describe microsystems as interactive situations within which children directly interact with another person. These microsystems include an individual's relationship with a parent (Richter, 1994) as well as lasting relationships with friends (Berndt & Ladd, 1989).

Lloyd (2002) argues that common components of a microsystem for adolescents include interpersonal relationships with family, friends and neighbours. Furthermore, in order to understand the influence microsystems have on an adolescent, one should recognize that adolescents are members of a number of microsystems. These microsystems may have different or similar roles for the adolescent to play. Thus an adolescent within the microsystem of club soccer might be called on to play the role of leader as captain even though within the family microsystem the same adolescent is the youngest and plays the role of follower.

2.4.2 Mesosystem

Bronfenbrenner (1989) refers to the mesosystem as a system of microsystems through which different settings are linked. Thus in the example above, the adolescent's club soccer microsystem and his friends microsystem could overlap in that friends might play soccer at the same club or that club teammates could become friends. Lloyd (2002) purports that these interwoven relationships could be supportive of both microsystems or in opposition to either of these microsystems. In the above example, the friends microsystem could be in opposition to the soccer club microsystems on weekends. Whereas the club microsystem needs the individual to be well-rested for the soccer match on the Saturday the friends microsystem requires the individual to go out and party till late on Friday evenings. Finally, Lloyd (2002) argues that even in instances where microsystems are in agreement, their impact is diminished if they do not operate in a successfully linked mesosystem.

2.4.3 Exosystems

Exosystems are contexts in which the individual is not directly involved. This system directly affects those who have a close relationship with the individual concerned. Even though the individual is not directly involved in this system, he or she is affected through their relationships with these others. Thus a parent's work situation does not involve the adolescent but a reduction in salary for a parent will have consequences for the adolescent.

2.4.4 Macrosystem

The macrosystem refers to the broader political, social and cultural influences exerted on the systems individuals find themselves in. The macrosystem is made up of features such as educational, religious and political values, as well as age- and gender-appropriate roles.

2.4.5 Chronosystem

Finally Dawes and Donald (2000) argue that one should also include a chronosystem that will reflect not only changes in the developing individual, but also changes in the developmental context. If one considers the historical and cultural time within which all the above systems operate, it will be evident that adolescents developing in apartheid South Africa would differ significantly from children developing in the South Africa of 2004. Whereas adolescents in apartheid South Africa had to contend with unjust racist laws and how those affected their development, adolescents in contemporary South Africa have to contend with how the information technology revolution will affect theirs.

Since this study assessed self-esteem, perceptions of social support from friends, perceptions of social support from family, as well as frequency of use of some of the new tools of the information technology revolution referred to by Dawes and Donald (2000) it will consider components of microsystems, the mesosystem, the macrosystem and the chronosystem. Since this work takes the form of a mini-dissertation, it would exceed its scope if it had to take into consideration components of the exosystem.

CHAPTER 3 METHODOLOGY

This study made use of a randomised cross-sectional survey as its methodological framework and is located within a quantitative research paradigm. Donald Campbell cited in Pretorius (2002) argues that quantitative research deals more with the realm of knowing whilst qualitative research deals with the realm of understanding. Another way of distinguishing between quantitative and qualitative research is to view quantitative research as a means of describing rather than explaining social reality and to view qualitative research as a means to capture and explain the essence of social reality (Pretorius, 2002). As such, this study employed a descriptive research design.

The key purpose of descriptive research is to provide a picture of social phenomena as they occur naturally. Descriptive research is appropriate when the research questions are correlative, univariate or normative. This type of research quantifies or characterises the sample in terms of frequencies or some other characteristic and may include questions that would describe the sample's status, compare that status to a standard, look at changes over time or look at relationships between variables (Hedrick, Bickman & Rog, 1993). This study looked at the relationship between a combination of frequency of use of NICT's and gender, and perceived social support and self-esteem.

3.1 Sample

This study made use of a descriptive design, and utilised probability sampling. The aim of this type of sampling is to ensure that each person in the sampling frame has the same

probability of being selected (De Vos, 1998). More specifically, this study used a simple random sampling strategy in order to select respondents.

In an attempt to access large enough numbers of adolescents for this study, it was decided to approach the Western Cape Education Department (WCED) for permission to use in-school youth as participants in this study. The WCED has 891 699 learners enrolled in 2620 schools throughout the Western Cape Province. However, large disparities between schools are evident. While some schools have abundant resources, excellent infrastructure and access to sophisticated technologies, others face a daily battle against overcrowding, violence and limited resources. Of the 2620 schools in the WCED, only 545 (20.80%) possess one or more computers. The statistic is even bleaker when one considers that of the 1472 public schools in the WCED only 195 (13.25%) possess at least one computer (September & Savahl, 2003).

In an attempt to access adolescents from schools who would have access to NICT's, this study used ex-Model C schools in the WCED as its sampling frame. These types of schools were previously private Whites only schools and in the previous dispensation had received preferential treatment in terms of funding for equipment and infrastructure. September & Savahl (2003) report that the WCED has 294 ex-Model C high schools in the Cape Metropolitan Area. Eleven of these ex-Model C high schools in the Cape Metropolitan Area were randomly selected and written permission was obtained from the Western Cape Education Department to approach these schools. Questionnaires were administered to no more than 100 students at each of these eleven schools culminating in a realized sample of 1002 participants distributed by age and gender as indicated in Table 1 below.

Table 1: Distribution of participants by Gender and Age

			GENDER			
			boy	girl	Count	% of Total
AGE	13	Count	83	134	217	21.7%
		% of Total	8.3%	13.4%		
	14	Count	145	183	328	32.7%
		% of Total	14.5%	18.3%		
	15	Count	100	111	211	21.1%
		% of Total	10.0%	11.1%		
	16	Count	107	139	246	24.6%
		% of Total	10.7%	13.9%		
Total		Count	435	567	1002	100.0%
		% of Total	43.4%	56.6%	100.0%	

The sample was split into 43.4% boys (N=435) and 56.6% girls (N=567), closely resembling the gender percentages of adolescents from the 2001 census data for the Western Cape (Statistics South Africa, 2003). The age of the sample ranged from 13 to 16 years of age. The sample was relatively evenly distributed with a modal age of 14 (32.7% of the sample, N=328).

3.2 Procedure

Written permission was obtained from the schools' governing bodies. The schools were visited beforehand and arrangements were made with the principals for a suitable venue for the administration of the questionnaire. Letters were handed to the pupils in order to get written consent from the pupils as well as their parents prior to the administration of the questionnaire. During the briefing session prior to the administration participants were once again reminded that the letter of consent indicated that participation was completely voluntary and participants were once again offered the opportunity to withdraw. None of the participants withdrew. Questionnaires were either administered by the author or one of the author's assistants in the learners' classrooms during a 45-minute period set aside by

the principal of the school. No staff member of the participating school was present during the administration. Learners were asked to leave their questionnaires on their desk after completing them.

3.3 Instruments

This study made use of three instruments viz. the Social Support Appraisals (SS-A) Scale (Vaux *et al.* 1986), the Self-esteem (SES) Scale (Rosenberg, 1965) as well as a biographical questionnaire. The biographical questionnaire included a self report open ended item that allowed respondents to fill in the number of hours they spend with different types of media equipment on a typical day over weekends or during holidays.

3.3.1 Social Support Appraisals Scale (SS-A)

Different authors have variously defined social support. Kaplan, Cassel and Gore (1977) argue that support is the extent to which an individual's social interaction meets the individual's needs for affection, security, approval, belonging, etc. (social needs). This view is therefore unambiguously subjective (Vaux, *et al*., 1986). Cobb (1976) has defined social support as

> 'information leading the subject to believe that he is cared for and loved, esteemed, and a member of a network of mutual obligations' (p.300).

Cobb (1976) thus argues that whether or not support is in fact support for the individual concerned depends on whether it leads to particular beliefs in the individual. This definition of support is thus based on a phenomenological view (Vaux, *et al.*, 1986).

This study will be focussed on the latter phenomenological view. The SS-A scale purports to measure the construct of support appraisals. They (Vaux, *et al*., 1986) unequivocally state that their 23-item instrument is based explicitly on Cobb's (1976) definition of social support. The SS-A scale thus attempts to ascertain the degree to which the respondent believes that he/she is

> 'loved by, esteemed by, and involved with family, friends and others'
> (Vaux, *et al*., 1986, p.203).

The SS-A was standardized on ten samples from two populations viz. student samples and community samples. The five student samples consisted of three undergraduate student samples (n_{s1}=156, n_{s2} = 87, n_{s3} = 100), one mature female students sample (n=98) and one Black undergraduate student sample (n=76). The five community samples consisted of three adult samples (n_1= 44, n_2 = 140, n_3 = 52) one sample consisting of fathers of the first student sample (n = 113) and one sample consisting of teenagers who were siblings of the first student sample (n = 113).

Vaux, *et al.*, (1986) report that three scores are typically calculated from the SS-A scale: a total for the scale (23 items); a family sub-scale (8 items); and a friends sub-scale (7 items). The remainder of the 23 items (eight in total) refers to other people in general (Vaux, *et al.*, 1986).

The main score as well as the scores for the subscales indicated good internal consistency. Mean Cronbach's alpha coefficients for these three scores were reported as .90, .85 & .84 respectively. Convergent validity with Procidano and Heller's (1983) Perceived Social

Support Scale as well as Holahan and Moos's (1982) Family Relations Index was also established (Vaux, *et al*., 1986).

Due to the fact that this study is focussed on adolescents' relationships with friends and families, as well as cost considerations and the scope of this mini dissertation, this study only utilised the friends and family subscales of the SS-A resulting in 15 items, the 8 family items and 7 friends items. The scores are calculated on a four point Likert type scale ranging from 'Strongly disagree' to 'Strongly agree' with no mid-point. The sub-scales are scored by summing the relevant items i.e. the family sub-scale is scored by summing the eight family items and the friends sub-scale is scored by summing the seven friends items.

The overall reliability was calculated as 0.84 for the reduced scale, 0.78 for the family subscale and 0.84 for the friends subscale. The reduced scale overall as well as the subscales thus all indicate good reliability.

3.3.2 Self-esteem Scale

The Rosenberg Self-Esteem Scale (RSES) purports to assess global self-esteem (Rosenberg, 1965). The scale consists of ten items constructed along a Guttman scale. Guttman scales consist of items from the same universe of content. These items thus originate from a hypothetically unified construct, which in this instrument's case is self-esteem (Wylie, 1974).

In an ideal Guttman scale consecutive items would represent increasing degrees of strength of the hypothetical construct. The increasing number of subjects who would subscribe to each consecutive item determines the degrees of strength of the items. One would thus be

able, in theory, to know which items any respondent subscribed to by looking at their rank positions in the group of respondents. Since the items are arranged in rank order of the number of respondents who subscribed to the item, a respondent would not have subscribed to any item higher than his or her rank in the respondent group (Wylie, 1974).

Reliability and unidimensionality of Guttman scales are calculated as a coefficient of reproducibility (Rep.) calculated as follows

Rep. = 1- [total number of errors ÷ (no. of items X no. of subjects)]

where errors refer to instances where respondents respond to an item in a manner inconsistent with the respondent's rank order. A coefficient of reproducibility of .90 or more has been arbitrarily taken as the minimum level at which one can infer that a scale is satisfactorily reliable and unidimensional (Wylie, 1974).

Rosenberg (1965) reports reproducibility values of .92 for a sample of high school students. An internal reliability score of r = .85 for this instrument, based on a two week test-retest method with a sample of 28 college students was reported by Silber and Tippet (1965). Pretorius (1991) reports internal consistency (coefficient alpha) scores of 0.77 on a university sample of 658 undergraduate students in Cape Town, South Africa.

Reliability and unidimensionality of Guttman scales are calculated as a coefficient of reproducibility (Rep.) calculated as follows

$$\text{Coefficient of reproducibility} = 1 - \frac{\text{Total Number of Errors}}{\text{Number of items X Number of Subjects}}$$

where errors refer to instances where respondents respond to an item in a manner inconsistent with the respondent's rank order. A coefficient of reproducibility of .90 or more has been arbitrarily taken as the minimum level at which one can infer that a scale is satisfactorily reliable and unidimensional (Wylie, 1974). The coefficient of reproducibility of the Rosenberg self-esteem scale within our sample of 724 students who answered the scale is 0.933, indicating acceptable reliability and unidimensionality. Further proof of reliability was attained by calculating the coefficient Alpha reliability score for this scale. The result of 0.75 indicates reasonable reliability.

3.3.3 Biographical Questionnaire

This questionnaire includes items for age (open ended), gender, grade and area of residence. Further biographical details were not included in order to set the participants' minds at ease regarding confidentiality. An open ended item was also included to assess frequency of use for computers, mobile telephones and television. This item was in tabular form with the different types of communication technologies listed in the first column. The second column allowed participants to write in how many hours per day they spent using each of the communication technologies listed on an average day over weekends or while on holiday.

3.4 Hypotheses

The primary hypothesis of this thesis is that gender interacts with frequency of use of the seven measured NICT's (i. frequency of use of television; ii. general computer use; iii. use of the internet; iv. educative CD-ROM's; v. video console games; vi. computer-based

games and; vii. cellphones) to influence self-esteem, social support from family and social support from friends. Thus:

H_0: Gender does not interact with frequency of use of NICT's to influence the measured variables

H_1: Gender interacts with frequency of use of NICT's to influence the measured variables

Should there not be any interaction effects, our secondary hypotheses are that there are: a) gender differences overall on the measured variables and b) frequency of use differences on the measured variables. Our secondary hypotheses are thus:

a) H_0: Girls and boys do not differ on the measured variables

H_1: Girls and boys differ on the measured variables

b) H_0: Those who do not use the NICT, those who use it at a low frequency and those who use it at a high frequency do not differ on the measured variables

H_1: Those who do not use the NICT, those who use it at a low frequency and those who use it at a high frequency differ on the measured variables

3.5 Analysis

All analyses were conducted using SPSS 11.0 (SPSS Inc., 2002). The open ended item in the biographical questionnaire that assessed the number of hours per day participants spent using a particular NICT was used to create frequency of use groups. Means were calculated for the number of hours spent with each of the NICT's, indicated in Table 2 below.

Table 2: Average number of hours spent with each of the NICT's

		Television	General computer use	Internet use	Educative CD-ROM's	Video console games	PC-based games	Cellphones
N	Valid	860	648	383	260	461	534	514
	Missing	142	354	619	742	541	468	488
Mean		6.9	3.7	2.9	2.3	4.0	3.4	5.0
Std. Error of Mean		0.17	0.13	0.16	0.17	0.17	0.14	0.28

The sample was subsequently split into 3 groups, those who did not use a particular NICT (zero hours) those who used an NICT moderately (below the mean) and those who used it excessively (above the mean).

Initial descriptive analyses were conducted in the form of cross-tabulations and calculations of Pearson's chi-square to ascertain whether a relationship existed between gender and frequency of use of the above-mentioned NICT's. Subsequent to this, a multivariate General Linear Model was used to test whether gender and frequency of use of NICT's interacted in any way to affect self-esteem as well as perceived social support from family and friends.

3.5.1 Crosstabulations

In order to ascertain whether a relationship exists between gender and frequency of use of all the NICT's examined, cross-tabulations with Pearson's Chi-square statistic were conducted. The chi-square statistic is appropriate for frequency problems i.e. when one wants to determine whether a relationship exists between two categorical variables (Pretorius, 1995).

However, Pretorius (1995) argues that the chi-square statistic merely indicates that a relationship exists between two variables in a contingency table. In order to examine the nature of the relationship between the variables, one would need to examine the values that are summed to calculate the chi-square statistic
{[(Observed Frequency−Expected Frequency)^2 ÷ Expected Frequency]
or [R^2/E]} so that one could ascertain which cells are contributing the most to the chi-square statistic. Furthermore, one would have to examine the sign of the residual {(Observed−Expected) or R} to determine the direction of the relationship (Pretorius, 1995).

3.5.2 General Linear Model

A multivariate General Linear Model was used to test whether gender and frequency of use of NICT's interacted in any way to affect self-esteem as well as perceived social support from family and friends. This type of analysis is essentially a combination of a multivariate analysis of variance (MANOVA) and a factorial analysis of variance and allows one to answer the following questions:

1. Does gender and frequency of use of NICT's interact to have an overall effect on self-esteem, social support from friends and social support from families? If so, on which specific variables are there interaction effects?
2. Do girls and boys differ overall in terms of the variables measured (self-esteem, social support from friends and social support from families)? If so, on which of the variables measured do they differ?
3. Do those groups of participants who do not use these NICT's, those who use it at a low frequency and those who use it at a high frequency differ overall in terms of the variables measured (self-esteem, social support from friends and social support from families)? If so, on which of the variables measured do they differ?

This analysis was conducted for each of the following NICT's:

1. Frequency of use of television,
2. General computer use,
3. Use of the Internet,
4. Educative CD-ROM's,
5. Video console games,
6. Computer-based games and
7. Cellphones

First, Pillai's Trace was used in the MANOVA tests to determine whether gender and frequency of use of each of the NICT's interacted to affect self-esteem, social support from friends and social support from families. In the cases where they did not interact, Pillai's Trace was examined to determine:

1. Whether there was an overall difference between girls and boys on self-esteem, social support from friends and social support from families
2. Whether there was an overall difference between those groups of participants who do not use these NICT's, those who use it at a low frequency and those who use it at a high frequency on self-esteem, social support from friends and social support from families

Secondly, factorial analyses of variance were conducted on those NICT's that indicated an overall difference on gender or frequency of use to determine on which measure (self-esteem, social support from friends or social support from families) they differed.

Finally, where differences were observed on any of the measures, means were compared for those groups, in order to determine how each group differed from the next.

CHAPTER 4 RESULTS

The results obtained from the data are presented below stratified by the type of NICT. Each NICT has a section detailing the results obtained for the crosstabulation and the general linear model. The chapter concludes with a summary table of all results.

4.1 Television

4.1.1 Crosstabulation

A statistical relationship exists between gender and frequency of use for television with a Pearson Chi-Square value of 7.06. Since the observed statistic is greater than the critical value for chi-square with 2 degrees of freedom, we reject the null hypothesis that there is no relationship between gender and frequency of use of television with $p<0.05$.

Table 3: Crosstabulation of Gender by Frequency of Use for Television

			GENDER	
			Boy	Girl
TV Use Groups	No Use	Count	4	14
		Expected Count (E)	7.8	10.2
		Residual (R)	-3.8	3.8
		Residual^2 (R^2)	14.44	14.44
		R^2/E	**1.85**	**1.42**
	Low Frequency	Count	253	291
		Expected Count (E)	237.2	306.8
		Residual (R)	15.8	-15.8
		Residual^2 (R^2)	249.64	249.64
		R^2/E	**1.05**	**0.81**
	High Frequency	Count	118	180
		Expected Count (E)	129.9	168.1
		Residual (R)	-11.9	11.9
		Residual^2 (R^2)	141.61	141.61
		R^2/E	**1.09**	**0.84**

As is evident in Table 3 above, the cells with the highest values for R^2/E in descending order are boys who do not watch television during weekends and holidays (1.85), girls who do not watch television during weekends and holidays (1.42), boys who watch television during weekends and holidays excessively (1.09) and boys who watch television during weekends and holidays in moderation (1.05). Further interpretation of the direction of the relationship reveals that girls are most likely to not watch television during weekends and holidays, while boys are least likely to not watch television during weekends and holidays. In addition, when boys do watch television during weekends and holidays, they are most likely to watch television in moderation.

4.1.2 General Linear Model

Examination of the P-value for Pillai's Trace in the interaction between gender and frequency of use of television as indicated in Table 4 below indicates that there is no significant interaction effect ($p>0.05$).

Table 4: Statistical test for the interaction of gender and frequency of use of Television

Effect		Value	F	Hypothesis df	Error df	Sig.
GENDER	Pillai's Trace	.024	4.311	3.000	537.000	.005
	Hotelling's Trace	.024	4.311	3.000	537.000	.005
TVHOLS3	Pillai's Trace	.024	2.204	6.000	1076.000	.040
	Hotelling's Trace	.025	2.207	6.000	1072.000	.040
GENDER * TVHOLS3	Pillai's Trace	.008	1.452	3.000	537.000	.227
	Hotelling's Trace	.008	1.452	3.000	537.000	.227

When one examines the main effects individually (Gender and Frequency of use of television) one notices that the P-value for Pillai's Trace is significant for both gender ($p<0.01$) and frequency of use of television ($p<0.05$) indicating an overall difference on self-esteem, social support from friends and social support from family on both main effects.

4.1.2.1 Gender

Table 4.1: Statistical test for gender differences.

GENDER							
Main Effect		SS from friends		SS from family		Self-esteem	
F	Sig.	F	Sig.	F	Sig.	F	Sig.
4.311	0.005**	9.523	0.002**	4.244	0.040*	0.018	0.894

Examination of Table 4.1 above indicates that significant differences are reported for social support from friends ($p<0.001$) and social support from family ($p<0.05$) for gender. Further examinations of the means for SS from friends and SS from family indicates that girls report a higher average perception of social support from friends than boys, while boys report a higher average perception of social support from family.

4.1.2.2 Frequency of use

Table 4.2: Statistical test for frequency of use differences.

TELEVISION							
Main Effect		SS from friends		SS from family		Self-esteem	
F	Sig.	F	Sig.	F	Sig.	F	Sig.
2.204	0.040*	1.203	0.301	4.250	0.015*	4.217	0.015*

When one examines the frequency of use of television variable in Table 4.2 above, one notices that significant differences are reported for social support from family ($p<0.05$) and self-esteem ($p<0.05$). Further examination of the means of the three groups (No Use, Low Frequency and High Frequency) indicates that those adolescents who watch television at a low frequency have a higher perception of support from family and a higher self-esteem than those who watch television at a high frequency or not at all.

4.2 General Computer Use

4.2.1 Crosstabulation

A statistical relationship exists between gender and frequency of use for computers with a Pearson Chi-Square of 26.53. Since the observed statistic is greater than the critical value for chi-square with 2 degrees of freedom, we reject the null hypothesis that there is no relationship between gender and frequency of use of computers in general with $p<0.001$.

Table 5: Crosstabulation of Gender by Frequency of Use for General Computer Use

			GENDER	
			Boy	Girl
PC Use Groups	No Use	Count	60	90
		Expected Count (E)	66.2	83.8
		Residual (R)	-6.2	6.2
		Residual^2 (R^2)	38.4	38.4
		R^2/E	**0.58**	**0.46**
	Low Frequency	Count	188	291
		Expected Count (E)	211.3	267.7
		Residual (R)	-23.3	23.3
		Residual^2 (R^2)	542.9	542.9
		R^2/E	**2.57**	**2.03**
	High Frequency	Count	104	65
		Expected Count (E)	74.5	94.5
		Residual (R)	29.5	-29.5
		Residual^2 (R^2)	870.3	870.3
		R^2/E	**11.68**	**9.21**

As is evident in Table 5, the cells with the highest values for R^2/E in descending order are high frequency boys (11.68), high frequency girls (9.21), low frequency boys (2.57) and low frequency girls (2.03). Further interpretation of the direction of the relationship reveals that boys are most likely to use computers in general at a high frequency, girls are less likely to use computers in general at a high frequency, boys are less likely to use computers in general at a low frequency while girls are more likely to use computers in general at a low frequency.

4.2.2 General Linear Model

Examination of the P-value for Pillai's Trace in the interaction between gender and frequency of use of computers in general as indicated in Table 6 indicates that there is no significant interaction effect ($p>0.05$).

Table 6: Statistical test for the interaction of gender and frequency of use of Computers in general

Effect		Value	F	Hypothesis df	Error df	Sig.
GENDER	Pillai's Trace	.036	6.364	3.000	514.000	.000
	Hotelling's Trace	.037	6.364	3.000	514.000	.000
PCHOLS3	Pillai's Trace	.010	.886	6.000	1030.000	.504
	Hotelling's Trace	.010	.886	6.000	1026.000	.504
GENDER * PCHOLS3	Pillai's Trace	.010	.844	6.000	1030.000	.536
	Hotelling's Trace	.010	.844	6.000	1026.000	.536

When one examines the main effects individually (Gender and Frequency of use of computers in general) one notices that the P-value for Pillai's Trace is significant for gender ($p<0.001$) but not for frequency of use of computers in general ($p>0.05$) indicating an overall difference on self-esteem, social support from friends and social support from family for gender but not for frequency of use of computers in general.

4.2.2.1 Gender

Table 6.1: Statistical test for gender differences.

GENDER							
Main Effect		SS from friends		SS from family		Self-esteem	
F	Sig.	F	Sig.	F	Sig.	F	Sig.
6.364	0.000**	10.791	0.001**	3.275	0.071	0.893	0.345

Examination of Table 6.1 above indicates that a significant difference is reported for social support from friends ($p<0.01$) for gender. Further examination of the means for social support from friends indicates that girls report a higher average perception of social support from friends than boys.

4.3 Internet

4.3.1 Crosstabulation

Table 7: Crosstabulation of Gender by Frequency of Use for the Internet

			GENDER Boy	Girl
Internet Use Groups	No Use	Count	132	197
		Expected Count (E)	146.9	182.1
		Residual (R)	-14.9	14.9
		Residual^2 (R^2)	222	222
		R^2/E	**1.51**	**1.22**
	Low Frequency	Count	141	154
		Expected Count (E)	131.8	163.2
		Residual (R)	9.2	-9.2
		Residual^2 (R^2)	84.6	84.6
		R^2/E	**0.64**	**0.52**
	High Frequency	Count	45	43
		Expected Count (E)	39.3	48.7
		Residual (R)	5.7	-5.7
		Residual^2 (R^2)	32.5	32.5
		R^2/E	**0.83**	**0.67**

As indicated in Table 7 above, no statistical relationship exists between gender and frequency of use of the Internet with a Pearson Chi-Square of 5.39. Since the observed statistic is smaller than the critical value for chi-square with 2 degrees of freedom, we accept the null hypothesis that there is no relationship between gender and frequency of use of the Internet with $p>0.05$.

4.3.2 General Linear Model

Examination of the P-value for Pillai's Trace in the interaction between gender and frequency of use of computers in general as indicated in Table 8 indicates that there is no significant interaction effect ($p>0.05$).

Table 8: Statistical test for the interaction of gender and frequency of use of the Internet

Effect		Value	F	Hypothesis df	Error df	Sig.
GENDER	Pillai's Trace	.016	2.551	3.000	465.000	.055
	Hotelling's Trace	.016	2.551	3.000	465.000	.055
INTHOLS3	Pillai's Trace	.011	.898	6.000	932.000	.496
	Hotelling's Trace	.012	.899	6.000	928.000	.495
GENDER * INTHOLS3	Pillai's Trace	.008	.657	6.000	932.000	.685
	Hotelling's Trace	.008	.657	6.000	928.000	.685

When one examines the main effects individually (Gender and Frequency of use of the Internet) one notices that the P-value for Pillai's Trace is not significant for both gender and frequency of use of the Internet ($p>0.05$) indicating that there is no overall difference on self-esteem, social support from friends or social support from family for gender and frequency of use of the Internet.

4.4 Educative CD-ROM

4.4.1 Crosstabulation

As is evident in Table 9 below, no statistical relationship exists between gender and frequency of use of educative CD-ROM's with a Pearson Chi-Square of 2.95. Since the observed statistic is smaller than the critical value for chi-square with 2 degrees of freedom, we accept the null hypothesis that there is no relationship between gender and frequency of use of educative CD-ROM's with $p>0.05$.

Table 9: Crosstabulation of Gender by Frequency of Use for Educative CD-ROMs

			GENDER	
			Boy	Girl
CD-Rom Holiday Use Groups	No Use	Count	193	220
		Expected Count (E)	182.3	230.7
		Residual (R)	10.7	-10.7
		Residual^2 (R^2)	114.5	114.5
		R^2/E	**0.63**	**0.5**
	Low Frequency	Count	81	120
		Expected Count (E)	88.7	112.3
		Residual (R)	-7.7	7.7
		Residual^2 (R^2)	59.3	59.3
		R^2/E	**0.67**	**0.53**
	High Frequency	Count	23	36
		Expected Count (E)	26.0	33.0
		Residual (R)	-3.0	3.0
		Residual^2 (R^2)	9	9
		R^2/E	**0.35**	**0.27**

4.4.2 General Linear Model

Examination of the P-value for Pillai's Trace in the interaction between gender and frequency of use of educative CD-ROM's as indicated in Table 10 below indicates that there is no significant interaction effect ($p>0.05$).

Table 10: Statistical test for the interaction of gender and frequency of use of Educative CD-ROMs

Effect		Value	F	Hypothesis df	Error df	Sig.
GENDER	Pillai's Trace	.012	1.666	3.000	428.000	.174
	Hotelling's Trace	.012	1.666	3.000	428.000	.174
CDRHOLS3	Pillai's Trace	.033	2.395	6.000	858.000	.027
	Hotelling's Trace	.034	2.400	6.000	854.000	.026
GENDER * CDRHOLS3	Pillai's Trace	.009	.633	6.000	858.000	.704
	Hotelling's Trace	.009	.632	6.000	854.000	.705

When one examines the main effects individually (Gender and Frequency of use of educative CD-ROM's) one notices that the P-value for Pillai's Trace is significant for frequency of use of educative CD-ROM's ($p<0.05$) but not for gender ($p>0.05$) indicating an overall difference on self-esteem, social support from friends and social support from family for frequency of use of educative CD-ROM's but not for gender.

4.4.2.1 Frequency of use

Table 10.1: Statistical test for frequency of use differences

EDUCATIVE CD-ROM'S							
Main Effect		SS from friends		SS from family		Self-esteem	
F	Sig.	F	Sig.	F	Sig.	F	Sig.
2.395	0.027*	5.846	0.003*	1.345	0.262	2.215	0.110

When one examines the frequency of use of educative CD-ROM's in Table 10.1 above, one notices that a significant difference is reported for social support from friends ($p<0.01$). Further examination of the means of the three groups (No Use, Low Frequency and High Frequency) indicates that those adolescents who use educative CD-ROM's at a low frequency have a higher perception of support from friends than those who use educative CD-ROM's at a high frequency or not at all.

4.5 Video Console Games

4.5.1 Crosstabulation

A statistical relationship exists between gender and frequency of use of video console games with a Pearson Chi-Square of 30.39. Since the observed statistic is greater than the critical value for chi-square with 2 degrees of freedom, we reject the null hypothesis that there is no relationship between gender and frequency of use of computers in general with $p<0.001$.

Table 11: Crosstabulation of Gender by Frequency of Use for Video Console Games

			GENDER	
			Boy	Girl
Video Console Games Holiday Use Groups	No Use	Count	96	171
		Expected Count (E)	124.7	142.3
		Residual (R)	-28.7	28.7
		Residual^2 (R^2)	823.7	823.7
		R^2/E	**6.61**	**5.79**
	Low Frequency	Count	152	166
		Expected Count (E)	148.5	169.5
		Residual (R)	3.5	-3.5
		Residual^2 (R^2)	12.3	12.3
		R^2/E	**0.08**	**0.07**
	High Frequency	Count	92	51
		Expected Count (E)	66.8	76.2
		Residual (R)	25.2	-25.2
		Residual^2 (R^2)	635	635
		R^2/E	**9.51**	**8.33**

As is evident in Table 11, the cells with the highest values for R^2/E in descending order are high frequency boys (9.51), high frequency girls (5.79), boys who do not use video game consoles during weekends and holidays (6.61) and girls who do not use video game consoles during weekends and holidays (5.79). Further interpretation of the direction of the relationship reveals that boys are most likely to use video console games excessively and girls less likely, while girls are most likely not to use video game consoles during weekends and holidays and boys less likely.

4.5.2 General Linear Model

Examination of the P-value for Pillai's Trace in the interaction between gender and frequency of use of video console games as indicated in Table 12 indicates that there is no significant interaction effect ($p>0.05$).

Table 12: Statistical test for the interaction of gender and frequency of use of Video Console Games

Effect		Value	F	Hypothesis df	Error df	Sig.
GENDER	Pillai's Trace	.019	3.026	3.000	463.000	.029
	Hotelling's Trace	.020	3.026	3.000	463.000	.029
VIDHOLS3	Pillai's Trace	.017	1.328	6.000	928.000	.242
	Hotelling's Trace	.017	1.329	6.000	924.000	.241
GENDER * VIDHOLS3	Pillai's Trace	.013	1.005	6.000	928.000	.421
	Hotelling's Trace	.013	1.006	6.000	924.000	.420

When one examines the main effects individually (Gender and Frequency of use of video console games) one notices that the P-value for Pillai's Trace is significant for gender ($p<0.05$) but not for frequency of use of video console games ($p>0.05$) indicating an overall difference on self-esteem, social support from friends and social support from family for gender but not for frequency of use of video console games.

4.5.2.1 Gender

Table 12.1: Statistical test for gender differences

GENDER							
Main Effect		SS from friends		SS from family		Self-esteem	
F	Sig.	F	Sig.	F	Sig.	F	Sig.
3.026	0.029*	7.048	0.008**	0.549	0.459	0.118	0.731

Examination of Table 12.1 above indicates that a significant difference is reported for social support from friends ($p<0.01$) for gender. Further examination of the means for social support from friends indicates that girls report a higher average perception of social support from friends than boys.

4.6 Computer-based Games

4.6.1 Crosstabulation

A statistical relationship exists between gender and frequency of use of computer-based games with a Pearson Chi-Square of 33.39. Since the observed statistic is greater than the critical value for chi-square with 2 degrees of freedom, we reject the null hypothesis that there is no relationship between gender and frequency of use of computers in general with $p<0.001$.

As is evident in Table 13 below, the cells with the highest values for R^2/E in descending order are high frequency boys (13.87), high frequency girls (11.45), low frequency boys (3.05) and high frequency girls (2.52). Further interpretation of the direction of the relationship reveals that boys are most likely to use computer-based games excessively and girls less likely, while girls are most likely to use computer-based games at a low frequency and boys less likely.

Table 13: Crosstabulation of Gender by Frequency of Use for PC-based Games

			GENDER	
			Boy	Girl
Computer-based Games Holiday Use Groups	No Use	Count	87	131
		Expected Count (E)	98.6	119.4
		Residual (R)	-11.6	11.6
		Residual^2 (R^2)	134.6	134.6
		R^2/E	**1.37**	**1.13**
	Low Frequency	Count	138	216
		Expected Count (E)	160.1	193.9
		Residual (R)	-22.1	22.1
		Residual^2 (R^2)	488.4	488.4
		R^2/E	**3.05**	**2.52**
	High Frequency	Count	115	65
		Expected Count (E)	81.4	98.6
		Residual (R)	33.6	-33.6
		Residual^2 (R^2)	1129	1129
		R^2/E	**13.87**	**11.45**

4.6.2 General Linear Model

Examination of the P-value for Pillai's Trace in the interaction between gender and frequency of use of computer-based games as indicated in Table 14 below indicates that there is no significant interaction effect ($p>0.05$).

Table 14: Statistical test for the interaction of gender and frequency of use of PC-based Games

Effect		Value	F	Hypothesis df	Error df	Sig.
GENDER	Pillai's Trace	.011	1.745	3.000	480.000	.157
	Hotelling's Trace	.011	1.745	3.000	480.000	.157
PCGHOLS3	Pillai's Trace	.010	.830	6.000	962.000	.547
	Hotelling's Trace	.010	.827	6.000	958.000	.549
GENDER * PCGHOLS3	Pillai's Trace	.009	.704	6.000	962.000	.646
	Hotelling's Trace	.009	.702	6.000	958.000	.648

When one examines the main effects individually (Gender and Frequency of use of computer-based games) one notices that the P-value for Pillai's Trace is not significant for both gender and frequency of use of computer-based games ($p>0.05$) indicating that there is no overall difference on self-esteem, social support from friends or social support from family for gender and frequency of use of the Internet.

4.7 Cellphone

4.7.1 Crosstabulation

A statistical relationship exists between gender and frequency of use of cellphones with a Pearson Chi-Square of 23.24. Since the observed statistic is greater than the critical value for chi-square with 2 degrees of freedom, we reject the null hypothesis that there is no relationship between gender and frequency of use of computers in general with $p<0.001$.

As is evident in Table 15 below, the cells with the highest values for R^2/E in descending order are boys who do not use cellphones during weekends and holidays (8.72), girls who do not use cellphones during weekends and holidays (7.18), low frequency boys (2.36) and low frequency girls (1.95). Further interpretation of the direction of the relationship reveals that boys are most likely not to use cellphones during weekends and holidays and girls less likely, while girls are most likely to use cellphones during weekends and holidays at a low frequency and boys less likely.

Table 15: Crosstabulation of Gender by Frequency of Use for Cellphone Use

			GENDER	
			Boy	Girl
Cellphone Holiday Use Groups	No Use	Count	134	96
		Expected Count (E)	103.9	126.1
		Residual (R)	30.1	-30.1
		Residual^2 (R^2)	906	906
		R^2/E	**8.72**	**7.18**
	Low Frequency	Count	154	232
		Expected Count (E)	174.3	211.7
		Residual (R)	-20.3	20.3
		Residual^2 (R^2)	412.1	412.1
		R^2/E	**2.36**	**1.95**
	High Frequency	Count	48	80
		Expected Count (E)	57.8	70.2
		Residual (R)	-9.8	9.8
		Residual^2 (R^2)	96	96
		R^2/E	**1.66**	**1.37**

4.7.2 General Linear Model

Examination of the P-value for Pillai's Trace in the interaction between gender and frequency of use of cellphones as indicated in Table 16 below indicates that there is no significant interaction effect ($p>0.05$).

Table 16: Statistical test for the interaction of gender and frequency of use of Cellphones

Effect		Value	F	Hypothesis df	Error df	Sig.
GENDER	Pillai's Trace	.011	1.760	3.000	464.000	.154
	Hotelling's Trace	.011	1.760	3.000	464.000	.154
CELHOLS3	Pillai's Trace	.022	1.724	6.000	930.000	.112
	Hotelling's Trace	.022	1.735	6.000	926.000	.110
GENDER * CELHOLS3	Pillai's Trace	.010	.812	6.000	930.000	.561
	Hotelling's Trace	.010	.810	6.000	926.000	.562

When one examines the main effects individually (Gender and Frequency of use of cellphones) one notices that the P-value for Pillai's Trace is not significant for both gender and frequency of use of cellphones ($p>0.05$) indicating that there is no overall difference on self-esteem, social support from friends or social support from family for gender and frequency of use of cellphones.

4.7.2.1 Frequency of use

Table 16.1: Statistical test for frequency of use differences

CELLPHONES							
Main Effect		SS from friends		SS from family		Self-esteem	
F	Sig.	F	Sig.	F	Sig.	F	Sig.
1.724	0.112	4.865	0.008**	0.126	0.881	0.816	0.443

However, when one examines the factorial analysis of variance statistics in Table 16.1, one notices that a significant difference is reported for social support from friends ($p<0.01$). Further examination of the means of the three groups (No Use, Low Frequency and High Frequency) indicates that those adolescents who use their cellphones at a low frequency have a higher perception of support from friends than those who use their cellphones at a high frequency or not at all.

4.8 Summary of Results

4.8.1 Cross-Tabulations

In summation, boys are most likely to use computers in general, video console games and computer-based games at a high frequency, watch television at a low frequency and not use cellphones during weekends and holidays. Girls, in opposition, are most likely to use computers in general, computer-based games and cellphones at a low frequency and not use video console games or watch television during weekends and holidays. There is no association between gender and either Internet use or educative CD-ROM use.

4.8.2 General Linear Model

In summation, gender did not interact with any of the NICT's to affect self-esteem or social support from either family or friends. When considering gender in the presence of each of these NICT's no gender differences were found for Internet use, educative CD-ROM use, PC-based games or cellphone use. However, gender differences were discovered for television, general computer use and video console games with girls scoring significantly higher on the perception of social support from friends than boys. In the case of television, it was found that boys had significantly higher perceptions of social support from family than girls. No differences for frequency of use were discovered for general computer use, Internet use, video console and PC-based games. Differences were discovered for television, educative CD-ROMS, and cellphones in that moderate use of these technologies were found to be associated with greater perceptions of social support from friends.

4.8.3 Overall Summary of Results

In conclusion one can see that gender is related to frequency of use of television, general computer use, video console games, computer-based games and cellphone use. Girls are more likely to not watch television or play video console games and more likely to use computers in general, computer-based games and cellphones moderately. In contrast, boys are more likely to not use cellphones, watch television moderately and use computers in general, video console games and computer-based games excessively.

When considering the interaction between gender and frequency of use of the above NICT's, one notices that there are no interaction effects for any of the NICT's. However, gender differences were seen for television, general computer use and video console games in that girls had a higher perception of social support from friends than boys. When considering television however, boys reported higher perceptions of social support from families than girls. Differences between the frequency of use groups were reported for television and educative CD-ROM's. Those who reported watching television in moderation (low frequency) reported higher perceptions of social support from families and higher self-esteem than those who did not watch television and those who watched television excessively (high frequency). Those who reported using educative CD-ROM's moderately (low frequency) reported higher perceptions of social support from friends than those who did not use educative CD-ROM's or those who used it excessively (high frequency). The above results are presented graphically in Table 17 below.

Table 17: Summary Table of Results

	Statistical Tests for Association		Statistical Tests for Differences		
NICT	**Relationship between Gender & Frequency of Use**	**Nature of relationship**	**Interaction between Gender and Frequency of use**	**Gender**	**Frequency of use**
Television	Yes	Girls more likely to not watch TV while boys more likely to watch TV in moderation	No	Yes, girls higher Social Support from friends than boys, also boys have higher perceptions of social support from family than girls.	Yes, low frequency users have greater perceptions of Social Support from friends than either high frequency users or those who don't watch TV.
General Computer	Yes	Girls more likely to use in moderation while boys more likely to use excessively	No	Yes, girls higher Social Support from friends than boys	No
Internet	No	No	No	No	No
Educative CD-ROM's	No	No	No	No	Yes, low frequency users have greater perceptions of Social Support from friends than either high frequency users or those who don't use educative CD-ROM's.
Video Console Games	Yes	Girls more likely to not use while boys more likely to use excessively	No	Yes, girls have higher Social Support from friends than boys	No
Computer Games	Yes	Girls more likely to use in moderation while boys more likely to use excessively	No	No	No
Cellphones	Yes	Girls more likely to use in moderation while boys more likely to not use at all	No	No	Yes, low frequency users have greater perceptions of Social Support from friends than either high frequency users or those who don't use cellphones.

CHAPTER 5. DISCUSSION AND CONCLUSION

The research attempted to determine whether gender and frequency of use of seven NICT's would interact to influence self-esteem and social support from family and friends. In order to determine this, this study's main hypothesis was that gender and frequency of use of these NICT's would interact to influence self-esteem and social support from family and friends. Secondary hypotheses were that boys and girls would differ in terms of self-esteem and social support from family and friends or that frequency of use groups would differ in terms of self-esteem and social support from family and friends.

5.1 Discussion

The findings indicate that, contrary to expectation, gender does not interact with frequency of use of any of the NICT's to influence self-esteem, social support from friends or social support from family. This may be due in part to the narrowing of the gender gap referred to by Subrahmanyam *et al.* (2000) where girls are reporting greater confidence in the use of NICT's as well as using it more often. Similarly, Becker (2000) reports similar patterns of NICT use for adolescent boys and girls.

5.1.1 Television

The only variable that boys scored significantly higher than girls on was social support from family in the presence of frequency of use of television. September and Savahl (2003) indicate that boys are more likely to watch television at home than at a friend's home while Woodward and Gridina (2000) report that boys watch television significantly

more than girls. Boys are thus spending significantly larger amounts of time at home than girls resulting in stronger familial bonding. The same argument applies for our finding that those who watched television in moderation (low frequency) reported higher social support from family and higher self-esteem than those who did not watch television and those who watched it excessively. These results contradict those of Cauce *et al*. (1982) whose research indicated an increase in support from the family for girls and a decrease in support from family for boys. One should consider, however, that the aforementioned research was conducted two decades ago when sex-role stereotypes were enforced more keenly than in our current context.

5.1.2 General Computer Use

The results indicated by the data that girls are more likely to use computers in general in moderation while boys are more likely to use it excessively concurs with Kline and Botterill (2001) who report that boys spend more time watching television than girls. The fact that girls had a higher perception of social support from friends than boys when considering frequency of use of computers in general can be attributed to girls reporting using this NICT not only at home but also at their friends' homes (September & Savahl, 2003). The shared experience of the NICT thus creates more opportunities for friends to spend time together while at the same time increasing the common experiences of the friends. Furthermore, Ho and Lee (2001) report that even though girls and boys spent even amounts of time using computers, girls spent significantly more time on computers doing homework, surfing the Internet and communicating with others while boys on the other hand spent significantly more time than girls playing computer games. While the former involves some form of interaction that could reinforce friendships (by engaging in

collaborative work such as doing homework together or working on group projects for school) the latter tends to be an exercise done in isolation in a competitive environment.

5.1.3 Internet

The data in this study contradicts recent research conducted by Becker (2000) who reports that girls are more likely to socialize online through chat rooms, email and by completing online surveys while boys are more likely to play online games and download software. In a similar vein the Environics Research Group (2001) reports that adolescent girls are twice as likely as boys to mention social factors as the biggest benefit of the Internet. Given the above, this study might not have been able to determine differences in Internet use due to the following factors:

a) The relative 'newness' of the Internet in South Africa with few households having the infrastructure (i.e. telephone landlines) needed to access the Internet

b) The expensive cost of connecting to the Internet (call charges as well as Internet service provider charges) relative to other countries

5.1.4 Educative CD-ROM's

Moderate use of educative CD-ROMs indicated a higher perception of social support from friends in our sample since these are used predominantly in the school setting (September & Savahl, 2003). Since the use of this particular NICT happens in the school and only 20% of schools in the Western Cape have more than one computer, access to educative CD-ROMs tends to happen in group settings. This encourages the augmentation and reinforcement of existing friendships (September & Savahl, 2003).

5.1.5 Video Console Games

The relationship between gender and frequency of use of video console games, where girls are most likely to not use this NICT and boys are most likely to use it excessively is similar to the findings of Woodward and Gridina (2000) who found that boys spent more time playing video games than girls. The differences found for video console games are similar to general computer use in that girls had a higher perception of social support from friends than boys when considering frequency of use of video console games. This may be as a result of the fact that girls report using video console games at home but also at their friends' homes (September & Savahl, 2003).

Furthermore boys between the ages of 8 and 14 have been the core target market of video console games such as Nintendo, Sega and Sony Playstation (Subrahmanyam *et al.*, 2000). Further gender differences in the literature with regards to video console games are that:

a) boys in comparison to girls spend more than twice as much time per week playing games (Funk, 1993)

b) boys are 5 times more likely than girls to own a video console gaming system (Griffiths & Hunt, 1995)

c) most games are based on fantasy, a preference of boys while girls prefer games based on reality (Subrahmanyam & Greenfield, 1998).

These games are also usually done in isolation in a competitive environment not conducive to establishing or maintaining a large social network.

5.1.6 Computer Games

Whilst no statistical differences were indicated for differences between gender or frequency of use groups, there was a statistically significant relationship between gender and frequency of use of computer games with girls more likely to use this NICT in moderation while boys are more likely to us it excessively. These reflect similar results obtained by Harrell, Gansky, Bradley, and McMurray (1997) who report that in their sample 33% of boys reported playing computer games while fewer than 10 % of girls reported the same. With regards to type of games played, Kline and Botterill (2001) report that boys prefer fighting and shooting games while girls prefer adventure or maze games.

5.1.7 Cellphones

Results from the data indicates that boys are most likely to not use cellphones while girls are most likely to use cellphones in moderation and those who use cellphones in moderation have greater perceptions of social support from friends than either excessive users or those who don't use cellphones at all. This is similar to Kline and Botterill (2001) who report that girls preferred "talking on the phone far more than boys" (p.8). Woodward and Gridina (2000) report similar results with girls spending significantly more time talking on the phone than boys.

Moderate use of cellphones indicated greater social support from friends most probably due to two factors. First, not communicating with social networks could lead to relationships extinguishing and secondly using your cellphone excessively to communicate with social networks could lead to you being seen as a nuisance and thus avoided, which could also lead to the ending of relationships.

In summation, our results seem to indicate that the gender gap is closing with regards to most NICT's including computer use. When considering the effect of frequency of use of NICT's on social support and self-esteem, the results indicate that using NICT's in moderation is preferable to excessive or no use.

5.2 Conclusion

The rapid growth of NICT's has significantly changed the current context of society (Scholtz and Steyn, 1998). The evolution of these NICT's coupled with changes in the structure of families is creating the opportunity for NICT's to become the prime socialization agents (Casas, 2001; Greenfield, 1998). Barthelmes (1991) argues that whereas the three most influential socialization agents in modern society have traditionally been the family, school and television, NICT's are rapidly developing into the primary source from which children interpret their world.

Whether the use of NICT's results in a deficit in social relationships or supplements these relationships has not been conclusively determined (Becker, 2000). This study has contributed to the ongoing discourse regarding the above by showing that, within our sample, frequency of use does not interact with gender to influence either self-esteem or social support from family or friends. Gender differences were found for social support from friends in that girls reported higher perceptions of social support from friends than boys (in the presence of television use, general computer use and video console games use) while boys reported higher perceptions of social support from their families than girls (in the presence of television use). With regard to the use of NICT's, this study has shown that, within our sample, different frequencies of use of computers in general, the Internet, video console games and computer-based games does not affect any of our measured

variables. However, moderate use of television, educative CD-ROMs and cellphones is associated with greater perceptions of social support from friends. No differences were found for self-esteem in the presence of any of the NICT's.

The findings thus indicate that it is not simply whether or not the use of these technologies leads to a decrease or supplements social relationships, but rather that the frequency of use of these technologies is the important factor. Moderate use of these technologies should be encouraged rather than the extremes of using these technologies excessively or not using it at all.

5.2.1 Limitations and recommendations for future research

One of the main limitations of this study is that learners were asked to recall how much time they spent with each of these NICT's. This is at best an estimate of their time use. Future studies should endeavour to make use of time-use diaries in order to have more accurate data.

The major limitation is the lack of information regarding content accessed with the NICT's. This study could not ascertain what participants were watching on television, what they used the computer in general for, what types of video console and computer games they played, what types of educative CD-ROM's they used, what they used the Internet for or whom they communicated with using their cellphones. This information would have given a richer more contextual understanding of how NICT's are influencing adolescents' lives. Further studies regarding NICT's in the lives of South African children should aim to include these types of information.

Finally, this study suffered the limitation of all quantitative studies in that it could only describe the situation as it appeared, and could not capture and explain the essence of the social reality for adolescents in this study.

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