

SELF-ESTEEM AND LIFE SATISFACTION OF AGED INDIVIDUALS WITH
AND WITHOUT ACCESS TO COMPUTER TRAINING

A Dissertation

by

CINDY ANN BROWN

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of
DOCTOR OF PHILOSOPHY

December 2004

Major Subject: Counseling Psychology

SELF-ESTEEM AND LIFE SATISFACTION OF AGED INDIVIDUALS
WITH AND WITHOUT ACCESS TO COMPUTER TRAINING

A Dissertation

by

CINDY ANN BROWN

Submitted to Texas A&M University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Approved as to style and content by:

David Lawson
(Co-Chair of Committee)

Michael Duffy
(Co-Chair of Committee)

Victor Willson
(Member)

Luana Zellner
(Member)

Michael Benz
(Head of Department)

December 2004

Major Subject: Counseling Psychology

ABSTRACT

Self-esteem and Life Satisfaction of Aged Individuals With
and Without Access to Computer Training. (December 2004)

Cindy Ann Brown, B.S., Northwest Missouri State University;

M.S., University of Kansas

Co-Chairs of Advisory Committee: Dr. David Lawson
Dr. Michael Duffy

Research indicates that today's aging population may obtain various benefits from using computer technology. These benefits include increased self-esteem, decreased depression, increased life satisfaction, and decreased loneliness; however, few of these studies have employed quantitative measures to quantify these results. This study focused on the possible benefits related to self-esteem and life satisfaction of older computer users. Participants belonged to either a control group or an experimental group. The experimental group participated in an eight-week computer training course. The control group did not receive computer training. All participants were administered the Rosenberg Self-Esteem Scale and the Life Satisfaction Index-Z at the beginning and the end of the study. The researcher hypothesized that participants who

received computer training would have higher levels of self-esteem and life satisfaction when compared with the group of participants who did not receive computer training. Results of the study indicated life satisfaction for both the control and experimental group rose slightly, but was not statistically significant. Therefore it is impossible to say that the SeniorNet computer training course helped to increase aged individuals' life satisfaction. These results may indicate that any sort of meaningful activity (either participating in a computer class or involvement in social activities at a senior community center) may increase an individuals' life satisfaction.

The results also indicated that self-esteem for the experimental group rose slightly after receiving computer training; however, these results were not statistically significant. It could be possible that the sense of mastery over a subject may have increased the participant's self-esteem, as stated in the study by Hoot and Hayslip (1983). Further research needs to be conducted on this population, and such research may enhance an aging population's outlook on life and themselves.

ACKNOWLEDGMENTS

I would like to first thank my committee members for supporting me and helping me through the specifics of this endeavor. I feel that I have a very strong and well-rounded committee. Each has specific skills for which they deserve to be recognized. I want to thank Dr. Luana Zellner for her expertise with qualitative data collection and computer technology, Dr. Michael Duffy for his gerontology expertise, Dr. Victor Willson for his statistical knowledge, and finally, Dr. David Lawson for helping me pull all of these components together into a final product.

I have to thank my husband for providing support and encouragement during the course of this study. This dissertation has been a long journey from beginning to end. At times I became very frustrated with data collection. At other times I would stare blankly at the computer with writer's block. Through it all, my husband kept pushing me to continue forward and to do the best that I could.

I am thankful that I had my husband to complain to when things were not going as I had planned on my dissertation. I am also glad that he was there to express joy to when things went well. Through those times my

husband continued to be accommodating and encouraged me to keep going.

I am also thankful to my son, Nathan. He is the one who kept me inspired through it all. He is the reason I have strived to become who I am today. He is the reason I get up each day and put forth my best effort.

Finally, I am thankful for the support of my family. Working on my degree has not always given me a lot of free time to spend keeping in touch with the people in my life who mean the most to me. They have always understood when birthday cards came late and phone calls were not returned. Most importantly, I have always known that they are very proud of me.

TABLE OF CONTENTS

	Page
ABSTRACT.....	iii
ACKNOWLEDGMENTS.....	v
TABLE OF CONTENTS.....	vii
LIST OF TABLES.....	ix
CHAPTER	
I INTRODUCTION.....	1
Aged Technology Usage.....	4
Negative Attitudes Toward the Aging Process.....	6
Benefits of Computer Use for the Aged.....	8
Purpose.....	11
Hypothesis I.....	12
Hypothesis II.....	12
II REVIEW OF THE LITERATURE.....	13
Computer Usage.....	14
Benefits of Computer Usage.....	20
Social Isolation.....	21
Positive Feelings.....	22
Assistance with Disabilities..	23
Life-long Learning.....	24
Literature on Aged Computer Usage..	27
Activity Theory.....	48
Life Satisfaction.....	50
Self-esteem.....	51
Need for Empirical Evidence.....	52
Summary.....	53

CHAPTER	Page
III METHODS.....	55
Participants.....	55
Instrumentation.....	61
Independent Variable.....	61
SeniorNet Training.....	61
Dependent Variables.....	61
Self-esteem.....	61
Life Satisfaction.....	62
Procedure.....	63
IV RESULTS.....	69
Sample Characteristics.....	70
Hypothesis I.....	75
Hypothesis II.....	79
Additional Data.....	86
V DISCUSSION AND CONCLUSIONS.....	91
Conclusions.....	91
Limitations.....	95
Future Research.....	98
Summary.....	100
REFERENCES.....	102
APPENDIX A.....	114
APPENDIX B.....	116
APPENDIX C.....	119
APPENDIX D.....	122
APPENDIX E.....	123
APPENDIX F.....	126
APPENDIX G.....	128
VITA.....	129

LIST OF TABLES

TABLE		Page
1	Demographic Differences Between Individuals Who Participated in a Computer Training Course and Those Who Did Not Participate in a Computer Training Course.....	74
2	Pre and Posttest Mean Scores and Standard Deviations as a Function of the Rosenberg Self-esteem Scale and Group Placement.....	76
3	Analysis for Covariance for Treatment Condition and the Rosenberg Self-esteem Scale (RSE).....	78
4	Univariate General Linear Model for Treatment Condition and the Rosenberg Self-esteem Scale (RSE).....	80
5	Pre and Posttest Mean Scores and Standard Deviations as a Function of the Life Satisfaction Index-Z and Group Placement.....	82
6	Analysis for Covariance for Treatment Condition and the Life Satisfaction Index-Z (LSI-Z).....	84
7	Univariate General Linear Model for Treatment Condition and the Life Satisfaction Index-Z (LSI-Z).....	85

CHAPTER I

INTRODUCTION

The elderly population in the United States has grown tremendously over the last 100 years. Current data indicate that the number of individuals over the age of 60 has increased dramatically (U.S. Census, 2000). It is estimated that by the year 2030, 20% of the population will be over the age of 65 (U.S. Census, 2000). This population increase is partly due to people living longer and healthier than ever before. There are more aged individuals living in the United States today than in any other period of history (Truluck & Courtenay, 1999).

Due to the latest advances in medical care and improved nutrition, the aging population is expected to continue to increase in the future (Truluck & Courtenay, 1999). Many factors are contributing to the increase in the aged population. These factors include: (a) declining birthrates, (b) gradual increases in life expectancy, and (c) an increasing number of people living out their full life spans (Truluck & Courtenay, 1999; Oyer & Oyer, 1976).

This dissertation follows the style and format of *The Journal of Counseling Psychology*.

With these increases in population also come age focused concerns.

As this population increases in age, they often experience numerous losses. Spouses and friends pass away and families often move long distances. Some individuals become isolated.

In addition to feeling isolated, physical complaints may be more common. Hearing, mobility, vision, and cognitive functioning, especially memory, can begin to decline as age increases (Farris, Bates, Resnick, & Stabler, 1994). Unfortunately, these losses can be exacerbated when society is not prepared for this growing segment of our country's population.

Increasing age is also often erroneously associated with increasing conservatism, intolerance of ambiguity, dogmatism, and reluctance to accept change or learn new skills (Randall, 1982). Such blatant stereotypes can cause serious damage to the aging population. These misconceptions send the message that old age is a time to disconnect from others. The message is sent that the older population is unable and unwilling to learn and try new things.

Society seems uncertain as to where the aged community fits into today's world schema. Many of today's aged individuals are not retiring at age 65. There are ever increasing numbers who are working past retirement and not solely for economic reasons (Baldi, 1997). These individuals are trying to find ways to remain productive in their later years; however, there seems to be a bias as to what the aged can do to remain productive.

Aging Americans do not need to disengage from society or former roles. Old age brings with it the opportunity to establish new relationships, memberships, and activities (Aiken, 1982). These opportunities allow and encourage elderly individuals to remain useful members of society.

The roles aged individuals renew or acquire can vary greatly. The ways in which these individuals fill their time is often influenced by the leisure activities they engaged in during middle age (Aiken, 1982). However, these activities do not need to be limited by past behaviors. Old age and retirement may be a good time to learn new hobbies and partake of new experiences.

The activities developed in early and middle adulthood provide a wide range of role options for aging individuals to choose. Research has shown that having hobbies and

enjoyed activities increases the likelihood of successful adjustment in later life (Aiken, 1982) regardless of whether it is a newly acquired or previously enjoyed hobby.

Today, the aging population has even more leisure activities to choose. These activities need not be limited to the traditional retirement past times of fishing, gardening, and shuffleboard (Aiken, 1982). Due to increasing advances and technology, the potential for senior leisure activities are more varied than ever before. Due to such advances, many seniors are learning to enjoy computer technology during their leisure time and reaping benefits from the use of technology. Computer technology can offer elderly individuals ways to remain in close contact with loved ones, the opportunity to make new friends, decrease feelings of isolation, and ultimately connect with society as a whole.

Aged Technology Usage

Older adults of today have lived through a radical transformation of their technological environment (Zimmer & Chappell, 1999). Modern technological devices have become commonplace in and around the home. Homes are now often equipped with microwave ovens, satellite televisions, home

alarm systems, home computers, DVD players, and a multitude of communication devices (Zimmer & Chappell, 1999).

Although technology is now commonplace, it has been generally believed that seniors are not especially receptive to technology (Zimmer & Chappell, 1999). It is believed that the ever-increasing pace with which technological advances are introduced may cause problems for people as they grow older (Breakwell & Fife-Schaw, 1988). Fortunately, these stereotypes appear unfounded. Numerous studies have found that once senior citizens are introduced to computers, many react very favorably to this form of technology (Morris, 1984; Ansley & Erber, 1988).

Older people have to a large extent missed out on the computer revolution due to having left the educational system and the work force before computer literacy was essential (Furlong, 1989). In many respects, the computer revolution has bypassed older adults (Farris, Bates, Resnick, & Stabler, 1994). The computer industry is partly responsible, having invested minimal effort in marketing products for the older consumer (Ansley & Erber, 1988). This is largely due to the misconception that older adults are unwilling to use computer technology.

Many older adults are conquering previous stereotypes by learning about new technology. Research has shown that older adults' computer attitudes are modifiable. It has been shown that direct computer experience can increase older individuals' computer efficacy and comfort (Jay & Willis, 1992). There is further evidence that older adults' attitudes toward technology will become increasingly favorable due to the higher educational levels of future aging Americans and the positive effect of familiarity with technology (Ryan, Szechtman, & Bodkin, 1992). This indicates a trend of older Americans enthusiastic to learn and use extensive computer technology. Unfortunately negative attitudes and stereotypes toward aging populations may inhibit senior citizens from learning new skills needed to benefit from computer technology.

Negative Attitudes Toward the Aging Process

Negative attitudes toward the aging process and the aged themselves exist and are common (Nussbaum, Pecchioni, Robinson, & Thompson, 2000). The expression of these attitudes can range from being very subtle, such as helping an elderly person cross the street because it is assumed he/she cannot do so on his/her own, to more blatant expressions, such as not hiring an individual for a job due

to his/her age regardless of qualifications for the job. Such actions are an example of ageism, the discrimination against aged individuals (Butler, 1969).

Ageism may intensify the already painful losses in hearing, mobility, vision, and cognitive functioning. Ageism causes the aged population to become increasingly marginalized by society in economic, social, political, and cultural terms (Elmore, 1999). The effects of ageism cause the older adult to further question his/her place in society.

Elements of prejudice or inaccurate stereotypes have influenced public perceptions of the capacities of older people (Elmore, 1999). These misconceptions can have damaging effects upon the lives of older adults causing this population to feel useless and degraded. Stereotypes can shape what an aged individual is expected to do for employment and leisure. Further, such misconceptions can cause senior citizens to question their own abilities.

Some members of society hold the widely pervasive view that older people ought to be more passive participants in economic, political, and community life (Elmore, 1999). People may see growing old as a time to disengage from previous activities. Too often elderly individuals are

thought to no longer be productive members of society. Society often expects the aged to grow old gracefully and quietly.

Fortunately, there has been a gradual improvement for aging Americans due to increased government benefits and services (Eilers, 1989). Service organizations are becoming aware of the potential among senior citizens and are discarding previous misconceptions. This, added with the emergence of a new senior population consisting of "baby boomers" that is projected to be healthier, better educated, and more active has helped to slowly change stereotypes (Eilers, 1989). This new cohort predicts positive life experiences for future generations of aging Americans. These individuals will help to ensure that the aging population is able to reap the benefits of computer technology.

Benefits of Computer Use for the Aged

Studies have indicated that the aging population can obtain numerous benefits from technology. These benefits include more convenient life-styles (Ogozalek, 1991), reduction of social isolation (Kearsley & Furlong, 1984; Adler, 1988; Pollack, 1990; Zimmer & Chappell, 1999), enhancement of self-esteem (Billipp, 2001; Hoot & Hayslip,

1983), improved quality of life (Bagley & Williams, 1988), life-long learning, (Skeet, 1982), and assistance with disabilities (Kautzmann, 1990; Kaye, 2000). These benefits are vast and could have an immeasurable improvement on the daily functioning of older adults.

Of particular interest for the present study are the stated benefits of enhanced self-esteem and life satisfaction among elderly individuals using computer technology. Several studies attribute increased self-esteem and life satisfaction to aged individuals using computers (Skeet, 1982; Hoot & Hayslip, 1983; Ryan & Heaven, 1986; Bagley & Williams, 1988; Eilers, 1989; Kautzmann, 1990). However, few of these attributions are supported by empirical evidence. Only one study, Billipp (2001), was found to empirically address the benefit of increased self-esteem related to the usage of computer technology with an aged population.

In this study, Billipp (2001), conducted a study to measure senior citizens' self-esteem, depression, and attitude toward computers in relation to computer usage. Participants in this study received training on using the computer. Participants were administered pre/post surveys to measure self-esteem, depression, and their attitudes

toward computers. Results indicated an increase in self-esteem among the computer users when compared to a control group who did not receive computer training.

Possessing positive self-esteem is often considered important because it has been found to be associated with higher levels of psychological health and functioning (Glaus, 1999). Low levels of self-esteem are considered negative and undesirable because it is often associated with poor psychological health and functioning (Glaus, 1999). A strong sense of self-esteem should be encouraged and promoted in today's elderly population. Billipp's research indicates that computers may be key to enhancing an aged individual's self-esteem.

This present study is similar to Billipp's study in that it utilizes pre/post surveys to address self-esteem of aged computer users. Both studies also compare an experimental group with a control group. This present study differs with Billipp's study by measuring life satisfaction of aged computer users.

Research has indicated that life satisfaction is increased in aged populations when they learn to use computer technology (Skeet, 1982; Bagley & Williams, 1988). None of the research that indicates that life satisfaction

is improved in the elderly due to computer technology has been backed with empirical evidence. This study hopes to add empirical evidence to the assertion that life satisfaction is increased due to use of computer technology.

The present study has the ability to add empirical evidence to Billipp's findings regarding self-esteem and aged computer users. This present study also has the ability to add empirical evidence to the premise that life satisfaction is enhanced when aged individuals learn to use computer technology.

Purpose

The purpose of this study is to extend empirical research in the area of computer technology related to the psychological constructs of self-esteem and life satisfaction among an aged population. By extending the research in this area, the researcher hopes to contribute to a better understanding of how senior citizens can benefit from involvement with computer technology. With this knowledge, service organizations in contact with elderly individuals may benefit by focusing on the technology needs among aged adults. This may be accomplished by setting up technology training that is

affordable and readily accessible to elderly individuals to learn about computer technology.

Hypothesis I

The use of computer technology will correspond to higher levels of self-esteem for aged individuals than for a group of aged individuals not currently utilizing computer technology.

Hypothesis II

The researcher hypothesizes that aged individuals who use computer technology will report higher levels of life satisfaction compared to individuals who do not utilize computer technology.

CHAPTER II

REVIEW OF THE LITERATURE

The twentieth century has produced spectacular advances in technology. Today's seniors have witnessed the evolution of many technological advances. Individuals born near the beginning of the twentieth century have experienced the following advances: (a) air travel, (b) space walks, (c) television, (d) computerized banking, and (e) world-wide communication via the Internet (Brown, Brown, & Baack, 1990).

The world these individuals reside in is rapidly changing due to today's value of a highly technologic society. There is some fear that due to these technological advances, the older population in this country may become isolated as their knowledge and skills become obsolete (Williams, 1978). The integration of today's older population into our technological society depends upon increasing their ability to master new technology, especially computers (Marquie, Jourdan-Boddaert, & Huet, 2002).

Computer Usage

Computers have revolutionized many aspects of our lives over the last 50 years. Technological advances have been astounding. The capability to store, retrieve, and manage information by the computer has changed the way our society does business, communicates, and entertains (Manheimer, Snodgrass, & Moskow-McKenzie, 1995). Most businesses and many households would have difficulty functioning without access to some form of technology, especially computers.

There is a perception that individuals over the age of 50 have not had access to or the opportunity to learn about computer technology when compared to younger generations (Thompson, 1995). To some extent this is true. Computer literacy is increasingly becoming an expected component of a well-rounded educational background (Ryan, Szechtman, & Bodkin, 1992). This was not the case when today's older population were in school. Today, children are being taught to use the computer as young as three years old. Unfortunately, today's older population missed out on many of these educational opportunities that are taken for granted by young people today.

Due to missed educational opportunities older adults often struggle with computer technology. This is seen in all realms of computer usage. For example, older people are lagging behind in respect to Internet access, even when socioeconomic and other demographic variables are controlled (Bikson & Panis, 1999). These lags can affect older adults' current and future job prospects.

The literature has recently documented a trend towards early retirement over the past few decades (Woodbury 1999); however, in light of increasing life expectancy, improving health status of older adults, and the government-mandated increase in the retirement age, many speculate that the trend towards early retirement is likely to slow or even reverse itself due to necessity (Quandango & Hardy, 1996; Woodbury 1999). Older workers may continue to work as hobbies or for pleasure, but economic realities are also becoming a likely factor of continuing late life employment (Opalinski, 2001).

In today's workforce computer technology is essential. Older adults must be willing to engage in technology training if they want to continue to be productive in the workforce. Unfortunately, older people have, to a large extent, missed out on the computer revolution due to having

left the educational system and work force before computer literacy was essential (Furlong, 1989).

Older individuals who continue to work may encounter other obstacles. Employers may assume older adults are unable or unwilling to undergo technology retraining and are therefore bypassed for training and retraining opportunities (Griffiths, 1997; Stagner, 1985). Some assume that the older worker is less capable, less efficient, less productive, more irritable, and in poorer health (Stagner, 1985). This leaves many seniors with a dilemma when faced with new technology and job status.

Older adults who are healthy, desire employment, and want to increase or maintain their standard of living should be retrained in today's workforce. They make valuable contributions to the economy and its ability to compete in the global marketplace (Lawhorn, Ennis, & Lawhorn, 1996). Plus, it has been found that seniors have lower job turnover rates than do their junior counterparts and retraining and improving older workers' skills is less expensive than hiring college graduates (Lawhorn, Ennis, & Lawhorn, 1996).

Computer companies have also contributed to the alienation of the aged computer user. Computer companies

have focused many of their marketing strategies on younger populations and those in the work force assumed to have more use for computer technology (Hoot & Hayslip, 1983). Natural exposure to computers is more likely to occur for younger men than for older men or women at any age (Krauss & Hoyer, 1984). These oversights and assumptions cause senior citizens to continue to struggle to learn about new technology.

Due to unsavory stereotyping and discrimination, senior citizens have not been readily accepted into today's technological era. Beliefs prevail that these individuals fear change and would not be interested in learning about new and generally faster ways of carrying out daily tasks.

It is unfortunate that these negative attitudes toward senior citizens and the aging process exist and effect opportunities available to these individuals. Views of senior citizens often include the effects of ageism and stereotyping. These views further inhibit technology usage by today's seniors.

The term ageism was coined by Butler (1969) to mean the systematic discrimination against all aged individuals. This discrimination may be blatant, such as not offering a job to an individual because he/she is 60 years old, or it

may be subtle, such as the small print used in newspapers, which make it difficult for individuals with failing eyesight to read. At times our society is amazingly unaware of it's discrimination toward the older population.

Stereotyping includes any preconception that is one-dimensional and limiting (Manheimer, Snodgrass, & Moscow-McKenzie, 1995). Stereotypes about the aged population range considerably. Some view the aged as being stubborn, frail, and cranky. Others view older adults as warm, and kind. These stereotypes are often based on one's own experience with this population. It is evident that long held stereotypes can easily effect one's perceptions of what an aged individual is capable of doing and achieving.

A study conducted by Ansley and Erber (1988) does not support the long held stereotype that senior citizens are resistant to computer technology. In fact, a study by Morris (1984) indicates that older people with negative attitudes toward computers report more positive attitudes after completing an introductory computer course. Jay and Willis (1992) also report that greater experience with computers and related technologies is associated with more positive attitudes toward computers by the elderly. This illustrates that not only are older people able to change

attitudes, but are willing to learn new tasks, such as tasks related to computer technology. As stated previously, it appears that a lack of opportunity rather than a lack of interest or motivation has kept many older people from benefiting from technology (Irizzary & Downing, 1997). Although it is true that younger persons have greater access to computers such as in schools and the work place, older persons are beginning to make some headway in the area of computer utilization (Thompson, 1995). The number of computer users over the age of 55 is increasing at a rate of 15% per year (Noer, 1995). Many older adults are beginning to see the necessity for computer literacy in our society.

Some senior citizens are learning to use the computer for entertainment, practical applications, programming, and to connect with information networks (Kearsley & Furlong, 1984). Others are using the computer for sending and receiving electronic mail and utilizing the Internet for information searches (Kaye, 2000). The benefit of these types of computer usage among senior citizens appears extremely promising.

Benefits of Computer Usage

According to the literature, the benefits of senior computer usage have the potential of being far reaching. Increased computerization may provide easier and more convenient life-styles for aging populations (Ogozalek, 1991). Bagley and Williams (1988) stated that technology presents an opportunity to improve quality of life, deal with disability, and provide a chance to enhance independence among senior citizens. This can be accomplished by providing aged individuals with access to information and services. For example, computer based communications systems can be used to help the aged do their grocery shopping, banking, and seek health care (Czaja, Guerrier, Nair, & Landauer, 1993).

The use of computer technology among the aged is vast and constantly improving. The current study focuses only on a subset of the benefits related to computer technology. The following benefits of senior computer usage will be discussed in more detail: reduction of social isolation, enhancement of positive feelings toward oneself or self-esteem, assistance to individuals with disabilities, and life-long learning.

Social Isolation

Computer usage could benefit seniors counter social isolation by enabling seniors to make contacts via computer networks (Pollack, 1990). Communication rated as a primary importance in computer ownership (Ashford, Lecroy, & Lortie, 1997). Communication becomes vitally important as an individual ages.

Decreases in social support have been linked to poor physical and psychological health. Low social support can actually increase the mortality risk for the elderly population. Research conducted by Seeman, Kaplan, Knudsen, Cohen, and Guralnick (1987) found that low social support was associated with a 69% increased risk of death in a group of individuals aged 70 years or older. When people have more social support they are often happier and healthier, both physically and mentally (Cohen & Wills, 1985).

Computers can actually promote social interaction among the elderly (Adler, 1988). Personal computers can put seniors in contact with friends across the country, help seniors find specialized information, and keep them in touch with the latest news, sports, weather, and business developments (Kearsley & Furlong, 1984). Electronic

networks have been shown to minimize isolation and loneliness for older individuals with disabilities that restrict mobility (Furlong, 1989). Technology could ultimately enhance social support and in some cases, when necessary, substitute social support for senior citizens (Zimmer & Chappell, 1999).

The Internet and other electronic communication is believed to be capable of increasing social relationships by freeing people from the constraints of geography or isolation brought on by illness, or schedule (Kraut, Patterson, Lundmark, Kiesler, Mukopadhyay, & Scherlis, 1998). Older individuals are encouraged to join groups and chat rooms based on interest rather than convenience.

The Internet has the potential to open many doors for older adults and increase social networks. It is important to recognize; however, that the Internet infrastructure is not a substitution for in-person contact, but establishes a different medium for personal communication that may enhance social networks (Bikson & Bikson, 2001).

Positive Feelings

Computer technology may be able to increase positive feelings regarding senior citizens perceptions of themselves. Mastering computer technology and using learned

skills on a daily basis can promote a sense of self-efficacy in the aged user and less dependence on others, as well as making many daily tasks easier (Hoot & Hayslip, 1983). Paying bills, communicating, and buying groceries on-line can accomplish this. These individuals do not have to rely on family or friends for transportation, worry about leaving their home during inclement weather, or worry about disabilities that may make mobility difficult. This provides older adults with more options and independence, which can increase positive feelings about oneself.

Assistance with Disabilities

Computer technology in residential care facilities also has the potential to increase positive feelings. The benefits of computers in homes for the aged are very impressive. These benefits may include improvement of mental status to enhancing their sense of personal identity, accomplishment, self-awareness, and self-esteem (Ryan & Heaven, 1986). These older adults can communicate with others outside of the residential care facility, play games that stimulate memory or other mental tasks, and read newspapers on-line. These types of activities help these individuals feel more like functioning members of society

thereby increasing personal identity, accomplishment, self-awareness, and self-esteem.

The use of computer technology has particular value for elderly persons who experience increasing limitations in physical abilities and mobility (Kautzmann, 1990). Computer technology and the Internet have a tremendous potential to broaden lives and increase independence of people with disabilities (Kaye, 2000). Computer technology can provide these individuals with a way to experience the world without ever leaving the home. Individuals can obtain information, shop, and speak to others via the Internet. Computer technology provides the means to help increase positive attitudes toward oneself by increasing ones' independence.

Life-long Learning

With the tremendous increase in the older adult population, it is very likely to see an increase in the number of older adults who participate in educational activities, especially regarding technology training. Traditionally, older adults have not been large consumers of educational services (Truluck & Courtenay, 1999). Today's society, due to rapid changes in technology, will

make it necessary for older adults to adapt and learn computer technology to successfully cope.

Senior citizens' motivation to learn about computer technology is as much from curiosity as necessity. Motivation consists of a variety of psychological processes that determine whether an individual will pursue goals, which goals will be pursued, and how effectively the goals will be pursued (Henderson & Dweck, 1990). Motivation can be involved in any activity where there is a standard of excellence (i.e., success or failure), the individual is responsible for the outcome, and where there is some level of challenge (Henderson & Dweck, 1990).

These standards can certainly be applied to the use of computers and attendance at computer training courses. Computer training courses offer individuals the potential for success or failure (pass/fail). The individual is responsible for the outcome, by committing to class and completing class assignments. Finally, computer training can certainly be challenging.

Unfortunately, little research has focused on the potential changes in motivation across the lifespan, especially in adulthood and old age (Carstensen, 1998). This makes it difficult to understand why senior citizens

enroll in computer training courses; however, it is believed that the motivation to seek educational information may remain constant throughout life and provides an incentive to seek such educational opportunities.

According to Skeet (1982) one of the needs of today's aged population is education, which can contribute to these individuals' quality of life. According to research, education and life satisfaction are closely correlated (Crandall, 1980). Those with higher education levels have been found to have higher life satisfaction scores, more positive self-concepts (Crandall, 1980), and are often more satisfied with their lives (Brockett, 1987). Computer training can provide senior citizens with such educational needs. The educational opportunities are immense and changing daily as new technology becomes available.

The above benefits could aid aged individuals immeasurably, especially those with little social support and those suffering from disabilities. These benefits establish the possibilities of computer technology in the lives of senior citizens.

Literature on Aged Computer Usage

Studies have indicated that senior citizens are not intolerant of computer technology. In a study conducted by Brown, Brown, and Baack (1990), 193 older adults with a mean age of 73.6 years were administered a 20 item measure, Attitude Toward Computer Usage Scale (ATCUS). Participants were found to be generally favorable of technology, but expressed hesitancy when questioned about personal technology usage.

Older adults without computer experience often express uncertainty and anxiety related to using technology. It appears that these individuals worry that they will not be able to successfully use technology or are fearful they may even damage equipment in the process of trying to utilize technology. Computer anxiety is common for all age groups. This anxiety appears to be unrelated to computer performance and is modifiable for all age groups with adequate training and support (Bikson & Bikson, 2001).

A study conducted by Irizarry and Downing (1997) produced similar results. The researchers administered a self-report questionnaire to 312 senior citizens. The questionnaire reflected the role of technology in the lives of senior citizens. The participant's ages ranged from 65

to over 80 years of age. Results showed participants had an overall positive attitude toward technology. The results of these studies help to establish that senior citizens are willing to learn about and use technology. Additional studies indicate that although many are likely to use technology, these individuals make up a distinct segment of the aged population. The following paragraph describes this segment of aged individuals.

Research has shown that exposure to computers is most common in regard to white-collar workers, regardless of age, education, sex, or socioeconomic status (Brickfield, 1984). According to a study conducted by Festervand and Wylde (1988) there are certain groups among the elderly who hold more favorable views of technology-based products. These groups consist of the younger, more active older adult, the better educated, more affluent, and those who have some prior experience with technology. Kerschner and Hart (1984) also stated that the older adult who uses computers and electronic devices to any degree represent a narrow subset of the aged population, which includes those individuals who have higher incomes and higher educational achievements. Peterson, Thornton, and Birren (1986) replicated these results.

Many studies introducing computers to aged individuals have centered on teaching the elderly to play computer games. Weisman (1983) introduced computer games to a frail elderly institutionalized population. Four different computer games were introduced to this frail population. The four games were Little Brick Out, Ribbet, Country Driver, and Hangman. Fifty residents participated in this study. The average age of the residents was 85. Although no quantitative measures were utilized, all of the residents who tried the games liked them enough to play a second time.

The Fullerton Senior Day Care Center is a YMCA program designed to provide community service to a target population including the slightly confused or moderately disabled elder who may be on a fixed or limited income (Zemke, 1986). This group of individuals was introduced to computers and allowed to engage in the following activities: play game shows on the computer, board type games (i.e., bingo, checkers, and chess), word games (i.e., crossword puzzles), computer art, printing programs, and music. Results of this study indicated that while clients of the senior day care center were not in full health, they found the computing activities challenging, fun, and

worthwhile. Many hoped for continued exposure to computer technology.

Another study worth mentioning also used computer games to introduce computers to the elderly. Kautzmann (1990) conducted research in four nursing homes, a senior citizens' center, and an adult day care center. Occupational therapy faculty and students from Eastern Kentucky University took computer hardware and software to each of the facilities to teach elderly individuals new leisure skills. The age range of the participants was 60 to 85 years of age. All participants had age-related problems and many had additional complications from disease or injury that limited their ability to participate in traditional leisure activities and maintain life roles. All participants were able to access the keyboard, see the keyboard keys, and follow simple verbal instructions. A one to two hour session was held at each facility to familiarize the participants to the computer. Elderly individuals were introduced to three different types of computer software. The first software program was a game called Fishies, which was a representation of an aquarium. Participants controlled the direction of the fish and fed them. The second software program was entitled Print Shop.

This software was used to print banners, cards, stationary and posters. The third software program was Create with Garfield, which allowed the participant to create a cartoon.

While no quantitative measures were utilized, the researchers assumed from observations of the positive responses that at least some short term increases in feelings of self-esteem and mastery occurred. Researchers described an increase in social interaction among participants, and between participants and facility staff. The increased interaction appeared to be the result of the shared experience. This project provided a new stimulus to these individuals' environment. The experience familiarized participants with the computer. The researchers noted that the use of the computer was a new skill that these elderly individuals proudly shared with family, friends, and staff.

Farris, Bates, Resnick, and Stabler (1994) conducted another study that utilized computer games with the elderly. This study was conducted at The Seattle Day Center for Adults with frail elderly at the center. The participants were taught a computer game called Memory for Goblins to enhance and assess the working memory of older adults. Five subjects were selected based on moderate

memory impairment. One subject dropped out of the study. The remaining four subjects ages ranged from 70 to 81. Subjects included one woman and three men. The study lasted six weeks and consisted of weekly one-hour sessions.

During the first week subjects were oriented to the computer. In the remaining five sessions, subjects each used the computer for 15 minutes. Due to the extremely small sample size no statistical results could be obtained. The researchers indicated, however, that although the clients had only a brief exposure to either use of the computer or to the game itself, their interest and desire to use computers remained very high.

Many senior citizens are not waiting to have the computer introduced to them. Some individuals are actively seeking out contact with technology. Computer classes directed toward an aged population are becoming more and more commonplace. Organizations, schools, and libraries are beginning to offer computer training to aged adults.

In a study conducted by Hollander and Plummer (1986), researchers taught a three-week hands-on computer class to 41 seniors in a senior apartment building. Two seminars and individual hands-on instruction were used to introduce participants to the computer. The researchers stated that

their approach of inviting residents to learn about computers was non-intimidating and positively received. Forty-one residents enrolled in the program and 21 completed the three-week session. Persons 76 years of age and older were the most consistent attendees. The researchers noted that the keyboard was the preferred method of accessing the computer. Post evaluation results indicated that 75% of the participants were interested in either learning more about new software or computer programming.

Another computer class for aged individuals was initiated at Little House in Menlo, California. Little House is a seniors' center that was founded in 1949 (Eilers, 1989). This senior citizens' center is sponsored by funds raised by Peninsula Volunteers, Inc., a philanthropic agency. In 1984, there were approximately 3000 members, ranging in ages from 50 to over 100. There was a 3:1 sex ratio of females to males. The computer courses at Little House were the first known to have originated and to be structured on a continuing basis at a senior center. This program was structured upon an age-peer instructional approach, which provided computer literate elders with new roles as teachers, computer laboratory

assistants, and organizers of computer learning experiences at the center. When this study originated in 1983, there were roughly 100 members. The computer classes included the following: (a) twelve BASIC lessons, (b) an advanced class based on the first 12 BASIC lessons, (c) a graphic's class, and (d) an in-house computer club in which membership depended on finishing the first 12 lessons. The study of the computer program at Little House consisted of a two-year ethnographic, or culturally descriptive, field study of a group of older computer users (Eilers, 1989).

Information was collected about (a) the characteristics of the participants, (b) their reasons and expectations of the computer class, (c) self-perceived outcomes of the computer class for this aged population, (d) barriers to computer literacy, and (e) ways to overcome any stated barriers.

To collect the data, a self-administered 12 page questionnaire incorporated both exploratory and evaluation questions (Eilers, 1989). The 63 respondents were current enrollees in the computer courses at Little House. There was a 3:1 female to male sex ratio among respondents. One year later, 10 advanced and 11 beginning computer students participated in a follow-up interview.

Demographic data revealed that the participants were between 61 and 70 years of age. Computer students were better educated than the average Little House member not enrolled in the computer course. Results also indicated that the computer students were more likely to use other forms of technology (i.e., calculators, and tape or video recorders) than nonparticipants.

When interviewed, Little House members gave many reasons for enrolling in the computer courses. In order of frequency, the reasons were the following:

1. Learning, including general curiosity, desire for general programming skills, mental challenge, and mental improvement.
2. Keeping up with the times, including desire to communicate with other computer users.
3. Practical applications, including business, personal accounts, investments, and graphics.
4. New past time, to include new hobbies or leisure activities (Eilers, 1989).

The researchers indicated that computer interaction had the potential to enhance self-esteem. This was concluded by individuals stating they felt much better after being involved in the computer classes at Little

House (Eilers, 1989). According to the researchers, other students felt that other people's reactions or attitudes toward them were much better since taking the computer course. Data from this study helps to confirm that computers encourage and reinforce feelings of accomplishment.

Little House members were perceived and described by their peers as sociable, active, involved, and busy, These individuals were described as always looking for something to do (Eilers, 1989). Activity and involvement were viewed by interviewees as important ways to stay young, alive and mentally healthy.

Researchers further concluded that computer literacy enabled seniors to reach out and communicate with younger relatives in new ways that were rewarding (Eilers, 1989). Students in the computer club enjoyed sharing their acquired computer knowledge with new members of Little House. Two interviewees felt that the club had been instrumental in improving the well being of other elders. The opportunity for older people to share computer skills and to take on new roles is potentially very beneficial.

Data from this study indicates that senior citizens can become computer literate when facilitated by convenient

access to computers (Eilers, 1989). Unfortunately due to economic status, many elderly individuals lack access to today's computer technology. In addition, misconceptions, such as the one that computer use is the domain of the young achiever, can have negative impact upon learning opportunities for seniors (Eilers, 1989). The previous study surely indicates seniors are willing and able to participate in the technology era.

A study conducted by White, McConnell, Clipp, Bynum, et al. (1999) initiated a study at a retirement community in North Carolina to evaluate the feasibility of providing access to computers and teaching residents Internet skills. The study was also conducted to obtain information regarding the impact of the use of e-mail, and Internet resources on the well-being of residents.

The researchers conducted a one-hour informational session at the retirement community to generate interest in the project among residents. This session consisted of teaching the residents the basics on computers and introduced residents to the Internet. At this time residents were informed that participation would require four to six hours per week and were told the study would last approximately five months.

During the informational session, 15 residents identified themselves as being interested in participating in the study. A comparison group of eight volunteers was made up of residents who showed initial interest in the study, but could not participate at that time due to scheduling difficulties. The comparison group was offered computer training after the study was completed.

Three interviews were conducted with the experimental group. One interview was conducted prior to participation in the study. Another interview was conducted with these participants two weeks after the computer training ended. Finally, the third interview was conducted with the participants five months after the first initial interview. The comparison group was interviewed at the beginning of the study and once again when the study ended.

Quantitative measures were used to gauge the effects of the intervention on psychosocial well-being. Both the experimental group and the comparison group were administered the Bradburn Affect Balance Scale, the UCLA Loneliness Scale, the Center for Epidemiologic Studies Depression Scale (CES-D), and the Duke Social Support Index.

Three computers were placed within a common area of the retirement home. The experimental group had 24-hour

access to the computers. The experimental group received nine hours of computer training by a computer consultant. The residents were taught how to turn the computer on, how to use the mouse, file management, and word processing. Training also included an introduction to the Internet and e-mail. Staff were available during scheduled times to assist with computer difficulties, and basic questions.

Instructions regarding computer usage were available for participants within the computer room in notebooks. Participants could also sign up to use a computer while an assistant was present. According to the research findings, the computer assistants spent more than 50% of their time providing hands on assistance. This assistance included dealing with technical problems, answering questions, one-on-one support, and offering suggestions regarding Internet searches. The participants enjoyed having staff available to help with any computer difficulties; however, by the end of the study, the assistants were providing participants with much less assistance. This shows that as the individuals became more comfortable with the computer as the study progressed they were able and willing to manage more computer problems on their own.

Results indicated that the computer was used most frequently for e-mail and to surf the Internet. Interviews conducted four months after the completion of the study indicated that the majority of the intervention group were still regularly using a computer. The researchers found a significant decline in loneliness among the experimental group, as measured by the UCLA Loneliness Scale. The researchers stated that there was little chance to detect differences in the Bradburn Affect Scale, the Duke Social Support Scale, or the Center for Epidemiologic Studies Depression Scale. The researchers attributed this to the fact that both the experimental and the comparison group scored highly on these tests at the beginning of the study creating a ceiling effect.

The results of this study indicated that this group of participants enjoyed learning to use the computer and also enjoyed communicating with other individuals via the Internet and e-mail. The results also indicate that the use of the Internet and e-mail may enhance the quality of life of retirement home residents by decreasing loneliness.

A study conducted by Billipp (2001) is one of the few studies that have employed quantitative methods to gauge the impact of computer use among an elderly population. The

researcher hoped to measure senior citizens' self-esteem, depression, and attitude toward computers in relation to computer usage. The researcher also measured a nursing staff's responses to providing computer training to patients.

In a three-month trial, computer terminals were installed in private residences. The study included 40 participants aged 65 years of age and older. Participants were randomly assigned to one of three computer-training groups or to a no computer control group. Experimental groups received training on using the computer to participate in chat rooms, play games, and order groceries on-line. All groups received weekly visits from a nursing staff.

The first computer-training group participated in a one-day computer training workshop. The second experimental group received weekly computer training from a nurse. The third computer-training group consisted of computer training provided to both the participant and the participant's significant other. The significant other met with the participant weekly to engage in computer training. The control group consisted of participants who received

weekly nurse visits, but received no computer terminal or computer training.

Nurses administered pre/post surveys during scheduled weekly visits. The participants were administered the following questionnaires: the Rosenberg Self-Esteem Scale, the Geriatric Depression Scale, and the Attitude Towards Computers Questionnaire. At the end of the study, the nursing staff completed the Nurse Response Scale to evaluate the nursing staff's reactions to patient computer usage.

Results of this study indicated a significant association between computer use and positive changes in self-esteem. Compared to the control group, the second experimental group (the weekly nurse training group) and the third experimental group (the weekly significant other training group) experienced significantly improved self-esteem scores.

There was no overall significant association between computer use and lowered levels of depression. However, when compared with the control group, the second experimental group (the weekly nurse training group) experienced significantly lower levels of depression.

Surprisingly, the results of the study indicated that aged participants became significantly less positive about computer usage as the study progressed. Also nurses' responses regarding the use of computers with the subjects indicated that most of the participating nurses saw minimal benefit in using computers with future patients.

More research is needed to explain changes in self-esteem and depression amongst aged computer users. Larger sample sizes and replication studies are needed to further investigate possible benefits to today's senior population. Further studies should also focus on individual attitudes toward computer usage among senior citizens.

One last program designed to introduce senior citizens to technology deserves detailed discussion. This program is SeniorNet. SeniorNet is a nonprofit organization that has set standards for introducing senior citizens to computer technology. SeniorNet evolved from a computer class entitled Computers for Kids Over 60 (Furlong & Kearsley, 1986).

Initial classes for Computers for Kids Over 60 (CKOS) took place in the Washington, D.C. area where a series of exploratory classes were conducted (Furlong & Kearsley, 1986). In the fall of 1984, CKOS was established at the

Center for Instruction and Technology at the University of San Francisco. The program worked in conjunction with the Fromm Institute at the University of San Francisco and local Bay Area senior groups. Computers for Kids Over 60 offered computer classes and camps for elders based upon their interest and needs. The purpose of the project was to discover the kinds of computer applications seniors were most interested in and the best ways to teach them about computers.

In the initial CKOS workshops in 1983, size was limited to 15 people and conducted in two-hour workshops in a variety of settings. The age range of participants was 57-95 with the median age being 69. Participants came from a wide range of socioeconomic backgrounds. About two-thirds of the participants were women, reflecting the general composition of the elderly population (Furlong & Kearsley, 1986). The total number of participants was 150.

The CKOS workshops focused on the following activities: (a) the use of computers for fun, (b) computer's practical applications, and (c) computer programming. Although no quantitative measures were used, the researchers observed that the participants were overwhelmingly positive about their computer use experience

(Furlong & Kearsley, 1986). Based on the positive results from the CKOS workshops, the researchers designed a telecommunication network for elders entitled SeniorNet (Furlong & Kearsley, 1986).

SeniorNet is a nonprofit organization with over 140 learning centers and over 27,000 members across the United States (Nussbaum, Pecchioni, Robinson, & Thompson, 2000). Today, SeniorNet has taught over 100,000 senior citizens computer skills. The computer centers are usually paid for by local sponsors, and are located in community centers, nursing homes, and schools (Pollack, 1990).

SeniorNet members are 50 years old and older and dedicated to providing senior citizens access to computer technology (Nussbaum, Pecchioni, Robinson, & Thompson, 2000). SeniorNet's goals include the following:

1. To develop sites where seniors can be introduced to computer use in a friendly environment tailored to meet their needs and interests.
2. To give seniors the opportunity to learn computer skills that will enable them to contribute their knowledge and wisdom to society.

3. To provide a means for seniors to communicate, socialize, and make new acquaintances through on-line communications.
4. To offer a means for seniors to keep informed of news and other important information.
5. To give seniors opportunities to learn computer skills (Furlong, 1989).

SeniorNet offers older adults computer training in the following areas: (a) desktop publishing, (b) word processing, (c) Internet access, (d) e-mail, and (e) financial planning (Nussbaum, Pecchioni, Robinson, & Thompson, 2000). With these basic skills, senior citizens make an enormous leap toward computer literacy. SeniorNet has broken through stereotypes and led the way in providing computer access for the elderly.

SeniorNet also developed an electronic city in 1986, which SeniorNet members accessed through a computer and modem (Furlong & Kearsley, 1986). Today, seniors can participate in SeniorNet computer classes or go on-line from their own homes or residential care centers. Older adults can participate in chat rooms, research projects, or other activities offered through the website.

Through the classes and site activities, seniors gain computer skills that can be used to write letters, produce flyers and newsletters, manage their money, and communicate with others (Furlong & Kearsley, 1986). These classes provide seniors with new skills that can enhance their lives, fill leisure time, and open new job opportunities.

SeniorNet conducted a telephone survey to determine the extent that elderly individuals use technology in their everyday lives. The study surveyed individuals 50 years of age and older. The results indicated that many senior citizens are adopting computer technology and increasing numbers are becoming enthusiastic computer users (Adler, 1996).

The SeniorNet study indicated that the most common use of the computer by subjects was word processing (Adler, 1996). Nearly 80 percent of older people reported using the computer for word processing. This was followed closely by using the computer to play games (60%), manage personal finances (54%), desktop publishing (34%), and to access an on-line service (28%). Adler (1996) wrote that one of the primary reasons reported by senior citizens for using personal computers was to send and receive e-mail. The

ability to communicate with family and friends who live in other cities was seen as a significant advantage.

Many researchers have reported positive psychological effects related to being actively involved in computer technology (Hoot & Hayslip, 1983; Furlong & Kearsley, 1986; Ryan & Heaven, 1986; Eilers, 1989; Kautzmann, 1990). Activity theorists would agree that these individuals' active participation in computer activities is enhancing these individuals' lives. Activity theory states aged individuals benefit most during old age by remaining active (Crandall, 1980). Senior citizens who become involved with computer technology remain active and report positive effects.

Activity Theory

Activity theory might be referred to as the golden-years concept of aging (Crandall, 1980). The ideal image of old age for activity theorists is one in which individuals maintain their prior activity levels. The theory claims that to be happy in old age, individuals need to keep active. Activity theorists believe that if existing roles or relationships are lost, it is important to replace them. Replacement of roles and relationships is necessary because

when activity drops, there is a corresponding drop in level of life satisfaction (Crandall, 1980).

Activity theory (Lemon, Bengston, & Peterson, 1972) maintains that remaining active in older age, and thereby socially involved, results in a positive identity and high well-being. People who continue to interact with others and pursue outside activities seem to adjust better to old age than those who become isolated and idle after retirement (Aiken, 1982). The more roles and relationships that an individual loses and does not or cannot replace, the greater the drop in the level of satisfaction. More recent theorizing about successful aging has also highlighted the importance of productive activities (Herzog & House, 1991). What constitutes a productive activity ranges from individual to individual. These are activities that one finds meaningful and worthwhile. These activities may involve, but are certainly not limited to volunteering, educating, or remaining in contact with family and friends. Activity theorists do admit, however, their theory is simple and is unlikely to explain the behavior of all elderly individuals.

Life Satisfaction

Some researchers have referred to increased life satisfaction related to the use of computer technology among elderly individuals (Skeet, 1982; Bagley & Williams, 1988). Lemon, Bengston, and Peterson, (1972) define life satisfaction as "the degree to which one is presently content with his general life situation" (p. 513).

Education and life satisfaction have been found to be closely correlated (Crandall, 1980). Those with higher education levels have been found to have higher life satisfaction scores, more positive self-concepts (Crandall, 1980), and are more satisfied with their lives (Brockett, 1987).

Research previously discussed has shown that the elderly who are most willing to learn about computer technology are individuals with higher education levels (Peterson, Thornton, & Birren, 1986; Festervand & Wylde, 1988). Although, no researcher has incorporated cognitive measures of life satisfaction into studies of elderly computer usage, one can assume that the individuals involved in these studies may have higher life satisfaction scores.

Self-esteem

The way people evaluate themselves is widely accepted as important by health and mental health care professionals. People who have relatively high self-regard tend to be better students, are bothered by less anxiety, are less depressed, display better physical health, and enjoy better social relationships (Gilberts, 1983). Learning a new skill, such as computer technology, that is associated with youth and the future can enhance one's self-regard or self-esteem (Farris, Bates, Resnick, & Stabler, 1994).

Self-esteem, unfortunately, is vaguely defined (Bogan, 1988). Wells and Marwell (1976) commented on the expansive number of terms and vast range of settings in which self-esteem constructs were used. They claimed that the same term might take on widely different meanings in the hands of different theorists, to refer to apparently the same construct. In this study, self-esteem is defined as the overall affective evaluation of one's worth, value, and importance (Blascovich & Tomaka, 1991).

High self-esteem is considered important because it is associated with higher levels of psychological health and functioning, and low levels of self-esteem are undesirable

because it is associated with lower levels of psychological health and functioning (Glaus, 1999). A strong sense of self-esteem is sorely needed among today's elderly population. Everyday is a struggle for many of these individuals. Decreased mobility, disabilities, and failing health can certainly affect one's sense of self-esteem.

Adults at any age need intellectual stimulation, development, and self-esteem, to be useful and to have a sense of achievement (Eilers, 1989). Computers may help alleviate problems with low self-esteem. The elderly computer user gains by having more independence and greater opportunity to create an individual life, as well as a positive influence on the user's self-esteem (Weber, Zimmerman, & Zink, 1995).

Need for Empirical Evidence

Since the study of technology and aging is still a relatively new field, there are still many areas that need to be explored. One of the most pressing needs is for experimental data (Ogozalek, 1991). Much data involving computer usage and the elderly is anecdotal (Ogozalek, 1991). This leaves a need for more objective measures of elders' computer capabilities. Many of the current publications simply report that aged populations enjoy

working with computers and obtain numerous psychological benefits without offering empirical evidence of these perceived psychological benefits. Numerous studies attribute computer use with increased self-esteem and increased life satisfaction without actually measuring these constructs (Skeet, 1982; Hoot & Hayslip, 1983; Ryan & Heaven, 1986; Bagley & Williams, 1988; Eilers, 1989; Kautzmann, 1990). These constructs need to be empirically tested among this computer using population.

Summary

All authors agreed that introducing computers to elderly persons had a positive effect on participants. There is evidence that older adults are more receptive to modern technology than was previously thought (Festervand & Wylde, 1988; Lesnoff-Caravaglia, 1989). Weismann (1983) observed that participants benefited from their feelings of mastery over the computer and considered it to be a learning experience. Fisher (1986) reported that participants expressed pride in successful performance of a task that once had been perceived as complicated. Fisher (1986) also reported that participants looked forward to spending time on the computer and that their shared

experience provided topics for discussion among elderly participants.

These findings are certainly worthwhile and encourage technology usage among the elderly. However, these studies are lacking in empirical evidence. Few of these studies attribute psychological benefits to the use of computers, specifically increased levels of self-esteem and life satisfaction through empirical evidence. This study hopes to contribute to the literature by empirically examining the benefits of computer usage among older adults. This study intends to empirically study the constructs of self-esteem and life satisfaction related to elderly computer usage. It is believed that individuals who actively engage in computer training will report higher self-esteem and life satisfaction when compared to individuals who are not exposed to computer training.

This study hopes to contribute to a better understanding of how senior citizens can benefit from involvement with computer technology. With this knowledge, senior citizen organizations may set up technology training that is accessible to elderly individuals to learn about computer technology, which may improve the well being of many aged individuals.

CHAPTER III

METHODS

This chapter is divided into three sections. The first section is devoted to participant description. The second section describes instrumentation. Lastly, the third section addresses data collection procedures.

Participants

Sixty individuals over the age of 50 were included in this study. Thirty participants belonged to the experimental group and thirty participants belonged to a control group. The experimental group was recruited from SeniorNet that is housed within the Plano Senior Center located in Plano, Texas. These individuals were enrolled to take part in SeniorNet's computer training course. The control group was recruited through several senior citizen centers in San Antonio, Texas. The control group did not participate in computer training.

Participants were solicited through senior citizens organizations in hopes of eliciting participants without cognitive impairment. Although this study did not include a formal assessment of cognitive functioning, the mental statuses of the participants in both the experimental and control group revealed no evident dementia or other thought

disorders. This was ascertained by receiving complete, legible, understandable responses on all surveys and questionnaires.

Twenty (66.7%) of the experimental group participants were female, and ten (33.3%) of the participants were male. Age of the experimental group ranged from 54 to 78 years of age ($M = 65.48$; $SD = 6.89$). Education level for the experimental group ranged from 11 years of education to over 18 years of education ($M = 14.29$; $SD = 2.24$). Of these participants 18 (69.2%) were married, six were widowed (23.1%), one was single (3.8%), and one (3.8%) was divorced. Seventy-six percent ($n = 23$) of the experimental group was retired, 20 percent ($n = 6$) was unemployed, and 3 percent was employed ($n = 1$). Nearly 70 percent of the population was Caucasian ($n = 16$), 21.7 percent were Asian ($n = 5$), 4.3 percent were African American ($n = 1$), and 4.3 percent were Hispanic ($n = 1$).

Income levels of the experimental group ranged from \$0 to \$100,000 dollars a year. Respondents on the income level reported that 16.7 percent had an annual income of \$0 to \$10,000, 45.8 percent had an income of \$10,000 to \$25,000, 16.7 percent had an income ranging from \$25,000 to \$40,000, 4.2 percent had an income ranging from \$40,000 to

\$55,000, 8.3 percent had an income ranging from \$55,000 to \$75,000, and 8.3 percent of the experimental group had an income ranging from \$75,000 to \$100,000 per year.

Participants of the experimental group reported their computer experience prior to the first computer training course. Most participants reported that they had never used a computer (46.67%; $n = 14$). Seven (23.33%) participants reported that they could play games on the computer. Another eight (26.67%) participants stated that they were able to use the computer to send e-mail. Seven (23.33%) participants stated they were able to log onto the Internet. Five (16.67%) of the participants belonging to the experimental group were able to do word processing on the computer. Two (6.67%) participants stated that they had considerable computer skills due to being trained to use a computer at their job prior to retiring. Twenty-four (80%) of the experimental subjects stated that they had a computer in their home prior to taking the SeniorNet computer training course.

Experimental group participants stated on the demographic form administered to them prior to the beginning of the computer course why they were interested in taking a computer course. Most of the participants ($n =$

24) reported that they wanted to learn how to use the computer. Some (n = 8) of these individuals wanted basic computer knowledge. Others (n = 6) wanted to learn specific skills like how to use e-mail, word processing, and the Internet. One participant wanted to take the course to "improve mental facilities and use a computer for communication." Another participant wanted to learn how to use the computer so he could write a book. Another participant wanted to use the skills to obtain a part-time job. Still another participant wanted to use the computer to "keep up with the times". Finally, one participant thought the class would be interesting.

Experimental group participants also described their hobbies. Gardening (n = 11) was the most reported hobby. Reading (n = 8) was also another popular hobby amongst the participants. This was followed by creative activities (n = 6), such as art, poetry, photography, music, and theater. Another five participants reported that they enjoyed quilting, knitting, and sewing. Four participants reported exercising (bicycling, walking, dancing, swimming, and tennis) as a hobby. Some participants also reported that they enjoy cooking (n = 4), watching TV (n = 3), fishing (n = 2), and volunteering (n = 2). Other hobbies included the

following: genealogy (n = 1), bird watching (n =1), playing computer games (n = 1), going to auctions (n = 1), playing Bridge (n = 1), making crafts (n = 1), investing in the stock market (n = 1), hunting (n = 1), playing with grandchildren (n = 1), and babysitting (n = 1).

Thirty participants belonged to the control group, who were recruited via posted notice within several senior citizen centers in San Antonio, Texas. Posted notices within senior centers were used as a recruiting campaign for control subjects in the spring of 2003. Posted notices solicited participants who did not have any prior computer experience or training; therefore the control group did not report previous computer experience or usage. All participation in this study was voluntary.

Twenty (66.7%) of the control group participants were female, and ten (33.3%) of the participants were male. Age of the control group ranged from 53 to 84 years of age (M = 68.57; SD = 8.33). Education level for the experimental group ranged from 10 years of education to over 16 years of education (M = 12.83; SD = 1.61). Of these participants 12 (44.4%) were married, eight were divorced (29.6%), six were widowed (22.2%) and one was single (3.7%). Sixty-three percent (n = 19) of the control group was retired, 23.3

percent (n = 6) was employed, and 13.3 percent was unemployed (n = 4). In the control group 73.3 percent of the population was Caucasian (n = 22), 13.3 percent were African American (n = 4), 10 percent were Hispanic (n = 3), and 3.3 percent were Asian (n = 1).

Income levels of the control group ranged from \$0 to \$75,000 dollars a year. Respondents on the income level reported that 6.7 percent had an annual income of \$0 to \$10,000, 53.3 percent had an income of \$10,000 to \$25,000, 23.3 percent had an income ranging from \$25,000 to \$40,000, 13.3 percent had an income ranging from \$40,000 to \$55,000, and 3.3 percent had an income ranging from \$55,000 to \$75,000.

Control group participants also described their hobbies. Reading (n = 9) was the most popular hobby amongst the participants. This was followed by watching TV (n = 6). Another five participants reported that they enjoyed playing cards. Four participants reported spending time with grandchildren. Some participants also reported that they enjoy exercising (n = 2) and cooking (n = 2). Other hobbies included the following: hunting (n = 1), shopping (n = 1), going to church (n = 1), and writing poetry (n = 1).

Instrumentation

Independent Variable

SeniorNet Training. This study involves two levels of the independent variable: a group who received computer training, and a group who did not receive computer training. Computer training consisted of eight sessions. Each session consisted of a weekly class, lasting two hours. Training consisted of an introduction to word processing, Internet, and e-mail. Computer usage was defined as participants actively using the skills learned in the computer-training course.

Dependent Variables

Self-esteem. Self-esteem is, unfortunately, vaguely defined (Bogan, 1988). Wells and Marwell (1976) commented on the expanse of terms and vast range of settings in which self-esteem constructs were used. They claimed that the same term might take on widely different meanings in the hands of different theorists. For the purposes of this study, self-esteem was defined as the overall affective evaluation of one's worth, value, and importance (Blascovich & Tomaka, 1991).

To measure self-esteem in this study the Rosenberg Self-Esteem Scale (RSE) was utilized (Rosenberg, 1987). The

RSE (Appendix A) consists of 10 items with a total possible score of 40. Respondents were asked to strongly agree, agree, disagree, or strongly disagree to test items. Items are scored on a 4-point Likert scale. Items 2, 5, 6, 8, and 9 are reverse scored so that in each case the scores go from less to more self-esteem. Higher scores indicate higher self-esteem.

The coefficient of scalability is 72 percent and the coefficient of reproducibility is 92 percent. These coefficients indicate an acceptable degree of internal reliability (Rosenberg, 1987). The author also boasts short-term stability with a two-week test-retest correlation of .85. This instrument was originally normed on college students but has been used with elderly populations to show changes in self-esteem, and according to Breytspraack and George (1979), is appropriate for measuring global self-esteem among aged populations.

Life Satisfaction. Some researchers have referred to increased life satisfaction as related to the use of computer technology among elderly individuals (Skeet, 1982; Bagley & Williams, 1988). Lemon, Bengston, and Peterson (1972) define life satisfaction as "the degree to which one is presently content with his general life situation" (p.

513). The author utilized Lemon, Bengston, and Peterson's definition to operationalize life satisfaction for this study.

To measure life satisfaction in this study the Life Satisfaction Index-Z (LSIZ) was utilized (Neugarten, Havighurst, & Tobin, 1961). This LSI-Z (Appendix B) consists of 18 items and is designed to measure psychological well being of the elderly. Responses are scored using response categories of agree, disagree, and unsure. Higher scores signify higher life satisfaction.

The LSI-Z showed a moderate correlation with the instrument from which it was developed, the Life Satisfaction Rating Scale, indicating some degree of concurrent validity. The LSI-Z also demonstrated a form of known-groups validity by successfully discriminating between high and low scorers. No reliability data was reported, but the rating scales from which the LSI-Z was developed had excellent inter-observer agreement.

Procedure

Participants were asked to participate and filled out a consent form (Appendix C). Participants belonged to one of two groups. The control group consisted of aged individuals who did not participate in SeniorNet's computer

training class. These individuals were recruited by posted notice (Appendix D) in senior citizen centers within San Antonio, Texas. These individuals were asked to contact the principal investigator if interested in participating in the study. Once contacted, the principal investigator sent the participants an informed consent letter (Appendix E) with the demographic questionnaire and inventories to be returned in a provided self-addressed stamped envelope.

The experimental group consisted of individuals who voluntarily enrolled in SeniorNet's computer training class. SeniorNet's president, Ann Wrixon, agreed to allow the proposed research to occur during SeniorNet's computer training courses.

Once the subjects agreed to participate in the study and signed the consent form, participants were administered a demographic questionnaire (Appendix F) addressing sex, age, racial identity, education, marital status, employment status, hobbies, and income at the beginning of the study. This experimental group was asked additional questions regarding previous computer experience. The experimental group was asked to describe their current motivation for completing the computer course. The experimental group was also asked whether they had a computer in their home. The

RSE and LSI-Z were administered to both the experimental and control group at the beginning of the study. The instruments took the participants approximately 20 minutes to complete.

The experimental group was introduced to computer training. Training consisted of eight sessions. Each session consisted of a weekly class, lasting two hours. The classes were taught by qualified instructors. Each classroom had mentors available to help answer participants' questions regarding any questions or difficulties experienced.

Training consisted of an introduction to computer basics. The first class consists of explaining how to turn the computer on and off. Students are shown how to use the mouse. The operating system of the computer is discussed with the students. Also during the first course the students are shown how to open and play games on the computer.

The second class begins with a review of the previous lesson. Most of the rest of the class is dedicated to word processing. The students are shown how to open Windows Explorer and open Word documents. Students are encouraged

to learn and use the keyboard. Students learn how to type a sentence in Word and how to cut and paste.

The third class begins with a review of the second class. Subjects open Word and learn how to setup the page. This class focuses on changing margins, font size of characters, and cut and paste.

The fourth class begins with a review of opening up Word documents and the page setup. Students then learn how to make a letterhead with various fonts. The class participants also learn how to use Clipart. The individuals learn how to print preview and how to save documents to a disk. The class ends with students learning to make a directory.

The fifth class begins with a review of the fourth class. Students learn how to create envelopes and labels during this class. Students continue to work with Clipart and learn how to change the color of their text. Students also learn how to print documents. The class ends with the students learning how to make a database.

The sixth class begins with a review of databases. Students are then encouraged to continue working on their databases. Students learn how to make a poster using Clipart during this class. Class participants get

introduced to the Internet and learn about various search engines.

The seventh class begins with a review of the last class. Participants are encouraged to learn more about the Internet and to practice using the Internet on their own. Students are also introduced to e-mail during this class.

The last class of the computer training course is designated for review of the class. Participants continue to use the Internet and e-mail. Individuals in the course also learn how to use help menus for all of the programs.

At the conclusion of the eight-week computer training course all participants were re-administered the RSE and LSI-Z. The control group was mailed the RSE and LSI-Z to complete. These instruments were administered to determine whether the access of computer training effected self-esteem and life satisfaction. Once again, these scales took approximately 20 minutes to complete.

Additionally, at the conclusion of the SeniorNet course the instructors administered a course evaluation form to the students in the course. The course evaluation form was to obtain feedback regarding course content, instructors, and lab facilities. The SeniorNet instructors

provided the researcher with this information to supplement data collected throughout the research study.

The course evaluation (Appendix G) asked class participants to evaluate the course content, and course length. Participants were asked to circle whether the course content was "Too Elementary", "Too Advanced", or "About Right". Participants were asked to circle whether the course length was "Too Short", "Too Long", or "About Right". Participants were then asked "Yes" or "No" questions regarding whether they would enroll in advanced computer classes, whether they would recommend the class to a friend, and whether they were able to apply the skills taught during the course. Individuals were also asked whether they had a computer in their home. The participants were asked to rate the class instructors and facility on a 5-point Likert scale (1 = Poor; 5 = Excellent. Finally, individuals were asked to provide written comments about the course. Specifically, what the participants did and did not enjoy about the class. There was also a space at the bottom of the page for general comments.

CHAPTER IV

RESULTS

The design of this study is a quasi-experimental between-groups pretest-posttest control group design. This study is considered quasi-experimental because there is no randomization of participants, and because the independent variable was manipulated. There are numerous strengths in using this type of research design. This type of research design controls for most threats to internal validity (Heppner, Kivlighan, & Wampold, 1999). The pretest scores can be used to reduce variability in the dependent variables. Pretest scores can also be used to describe the study's participants. Finally, the pretest-posttest scores allow for the examination of the individual performance of specific participants. Statistical analysis for this study included the use of univariate general linear model to compare differences between group means to estimate the effect of covariates on the dependent variables. The analysis of covariance (ANCOVA) was used to control for pretest differences between groups by examining the group regression lines. This was accomplished by holding constant the pretest scores to look for significant differences between the posttest scores for the two groups.

Qualitative data was also obtained for this study. Qualitative data was collected through the participants' demographic forms and course evaluation forms. Qualitative data has been used to enrich the data obtained from the RSE and the LSIZ.

Results of the present study will be arranged in three sections. The first section will address the characteristics of the participants. The second section will address the analysis used to test this study's first hypothesis. The last section will address the analysis used to test this study's second hypothesis.

Sample Characteristics

Sixty individuals over the age of 50 were included in this study. Thirty participants belonged to the experimental group and thirty participants belonged to the control group. Composition of both groups consisted of twenty (66.7%) females and ten (33.3%) males. Age of the experimental group ranged from 54 to 78 years of age ($M = 65.48$; $SD = 6.89$), while age ranged from 53 to 84 years of age ($M = 68.57$; $SD = 8.33$) in the control group. Education level of the experimental group ranged from 11 to over 18 years of education ($M = 14.29$; $SD = 2.24$). The

education level of the control group ranged from 10 to over 16 years of education ($M = 12.83$; $SD = 1.61$).

In the experimental group 18 (69.2%) were married, six were widowed (23.1%), one was single (3.8%) and one was divorced (3.8%). Of the participants in the control group, twelve were married (44.4%), eight were divorced (29.6%), six were widowed (22.2%), and one was single (3.7%).

Seventy-six percent ($n = 23$) of the experimental group were retired, 20 percent ($n = 6$) were unemployed, and three percent ($n = 1$) were employed. In comparison, 63 ($n = 19$) percent of the control group were retired, 23.3 percent were employed ($n = 6$), and 13.3 percent ($n = 4$) were unemployed.

Ethnicity of the groups was also obtained. In the experimental group nearly 70 percent of the participants were classified as Caucasian (n = 16), 21.7 percent as Asian (n = 5), 4.3 percent as African American (n = 1), and 4.3 percent as Hispanic (n = 1). In the control group, 73.3 percent of the participants were classified as Caucasian (n = 22), 13.3 percent as African American (n = 4), 10 percent as Hispanic (n = 3), and 3.3 percent as Asian (n = 1).

Income levels of the experimental group ranged from \$0 to 100,000 dollars a year. Respondents reported on the income level that 16.7 percent had an annual income of \$0 to \$10,000, 45.8 percent had an income of \$10,000 to \$25,000, 16.7 percent had an income ranging from \$25,000 to \$40,000, 4.2 percent had an income ranging from \$40,000 to \$55,000, 8.3 percent had an income ranging from \$55,000 to \$75,000, and 8.3 percent of the experimental group had an income ranging from \$75,000 to \$100,000 per year.

Income levels of the control group ranged from \$0 to \$75,000 dollars a year. Respondents reported on the income level that 6.7 percent had an annual income of \$0 to \$10,000, 53.3 percent had an income of \$10,000 to \$25,000, 23.3 percent had an income ranging from \$25,000 to \$40,000, 13.3 percent had an income ranging from \$40,000 to \$55,000, and 3.3 percent had an income ranging from \$55,000 to \$75,000.

Table 1 depicts the demographic differences between the individuals who participated in computer training and those who did not participate in computer training. The two groups were similar demographically. The only statistically significant difference that was found between the groups was related to years of education [$t(1, 48.81) = 2.815$, $p. = .007$]. In this study, the experimental group completed more years of education than the control group.

Table 1

Demographic Differences Between Individuals Who Participated in a Computer Training Course and Those Who Did Not Participate in a Computer Training Course

	<u>No Computer Training</u>		<u>Computer Training</u>		
Demographics	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>t</u>
Age	68.57	8.33	65.48	6.89	57 1.547
Gender	1.67	.48	1.47	.48	58 .000
Ethnicity	1.43	.82	1.78	1.28	35.33 1.144
Years of School	12.83	1.61	14.29	2.24	48.81 2.815*
Marital Status	2.30	1.27	1.81	1.30	51 1.388
Income	2.53	.94	2.67	1.49	36.86 .381
Work Status	2.40	.86	2.73	.52	47.92 1.824

*p < .05.

Hypothesis I

The first hypothesis stated the use of computer technology would correspond to higher levels of self-esteem for aged individuals compared to a group of aged individuals not currently utilizing computer technology. This hypothesis was tested by using the univariate general linear model to compare differences between group means and to estimate the effect of covariates on the dependent variable (RSE).

Table 2 provides the pre and posttest means and standard deviations of the RSE for the experimental and control groups. The mean RSE score for the experimental group was $M = 31.47$; $SD = 3.65$ on the pretest.

Table 2

Pre and Posttest Mean Scores and Standard Deviations as a Function of the Rosenberg

Self-esteem Scale and Group Placement

Source	Pretest		Posttest	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Rosenberg Self-Esteem Scale				
Experimental	31.47	3.65	32.13	4.02
Control	31.27	3.92	31.17	4.01

This was similar to the mean for the control group pretest scores ($M = 31.27$; $SD = 3.65$). The mean RSE posttest score for the experimental group was $M = 32.13$; $SD = 4.02$ as compared to the posttest scores for the control group ($M = 31.17$; $SD = 4.01$).

Table 3 examines the group by covariate effect on the RSE. The table shows the interaction between pretest RSE and the treatment condition is nonsignificant with a small F statistic (.766) and a large significance value (.385). Therefore, in this study pretest scores on the RSE did not have a significant effect on the posttest scores on the RSE by pretest RSE level.

Table 3
 Analysis of Covariance for Treatment Condition and the Rosenberg Self-esteem Scale

<u>(RSE)</u>		<u>df</u>	<u>MS</u>	<u>F</u>	<u>Sig</u>
Pretest RSE (covariate)		1	706.091	182.938*	.000
Treatment Condition		1	4.258	1.103	.298
Pretest RSE X Treatment Condition		1	2.958	.766	.385
Error		56	3.860		

*p < .05.

Since there was no covariate interaction the covariate term was removed and the univariate general linear model was utilized. Results of this analysis are summarized in Table 4. According to this analysis, there is not a significant linear relationship between the posttest scores on the RSE and the treatment group [$F(1,60) = 2.378, p = .129$].

Hypothesis II

The second hypothesis stated that aged individuals who use computer technology would report higher levels of life satisfaction compared to individuals who do not utilize computer technology. This hypothesis was tested by using the univariate general linear model to compare differences between group means to estimate the effect of covariates on the dependent variable (LSI-Z).

Table 4

Univariate General Linear Model for Treatment Condition and the Rosenberg Self-esteem

<u>Scale (RSE)</u>					
Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>Sig</u>	
Pretest RSE	1	716.53	186.406*	.000	
Treatment Condition	1	9.143	2.378	.129	
Error	57	3.844			

*p < .05.

Table 5 outlines the pre and posttest means and standard deviations for the administration of the LSI-Z for the experimental and control groups. The mean for the experimental group (M = 11.5; SD = 4.59) on the pretest was similar to the mean for the control group pretest scores (M = 13.93; SD = 3.53). The mean for the experimental group for the posttest was (M= 12.1; SD = 4.08) as compared to the posttest scores for the control group (M = 14.33; SD = 3.56). As shown by the data, it is evident that the pretest scores on the LSI-Z are very similar for both the control and experimental groups. The posttest scores varied slightly between the control group and experimental group with the mean of the control group slightly higher than the mean for the experimental group.

Table 5

Pre and Posttest Mean Scores and Standard Deviations as a Function of the Life

Satisfaction Index-Z and Group Placement

Source	Pretest		Posttest	
	\bar{M}	\underline{SD}	\bar{M}	\underline{SD}
Life Satisfaction Index-Z				
Experimental	11.5	4.59	12.1	4.08
Control	13.93	3.53	14.33	3.56

Table 6 examines the group by covariate effect on the LSI. The graph shows the interaction between pretest LSI-Z and treatment condition is nonsignificant [$F(1, 56) = 2.743$; $p = .103$]. Therefore, in this study pretest scores on the LSI-Z did not have a significant effect on the posttest scores on the LSI by pretest LSI-Z level.

Since there was no covariate interaction the covariate term was removed and the univariate general linear model was utilized. Results of this analysis are summarized in Table 7. According to this analysis there is not a significant linear relationship between the posttest scores on the LSI-Z and treatment group [$F(1, 60) = 2.056$, $p = .157$].

Table 6

Analysis of Covariance for Treatment Condition and the Life Satisfaction Index-Z

<u>(LSI-Z)</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>Sig</u>
Pretest LSI-Z (covariate)	1	646.07	189.97*	.000
Treatment Condition	1	6.992	2.056	.157
Pretest LSI-Z X Treatment Condition	1	9.328	2.743	.103
Error	56	3.401		

*p < .05

Table 7

Univariate General Linear Model for Treatment Condition and the Life Satisfaction

Index-Z (LSI-Z)

<u>Source</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>Sig</u>
Pretest LSI-Z	1	649.591	185.341*	.000
Treatment Condition	1	.828	.236	.629
Error	57	3.505		

*p < .05

Additional Data

Seventeen experimental group participants completed a course evaluation form that was given to the participants by the SeniorNet course instructors at the end of the eight week computer training class. This information provided the researcher with more in-depth information regarding participants' reactions to the class. This form incorporated both qualitative and quantitative data. All 17 (100%) of the participants rated the course content difficulty as "About Right." Fifteen (88.27%) of the participants stated that the course length was "About Right." Two participants (11.73%) stated the course length was "Too Short". Sixteen (94.12%) participants stated they would be interested in a more advanced class. Sixteen (94.12%) of the participants stated that they have a computer at home. Sixteen (94.12%) of the participants also stated that they would feel comfortable applying the skills they had learned throughout the course. All 17 (100%) participants reported that they would recommend the class to a friend. All 17 (100%) of the class participants rated the instructor's knowledge, instructor's teaching, and the lab facilities as "Excellent" on a 5-point Likert scale (1 = Poor; 5 = Excellent).

The experimental group participants also provided written comments on the course evaluation form. Participants provided class instructors with information regarding what they enjoyed about the class, what they did not enjoy about the course, and any additional comments. These comments added rich descriptive data to the quantitative data obtained by the surveys.

Participants expressed very positive sentiments regarding the SeniorNet computer course. When asked what he/she liked about the class, one participant wrote, "All of it!" Most responses focused on the instructors, the learning experience, and the pace of the class.

Most participants (n = 10) expressed a fond appreciation for the instructors teaching the SeniorNet computer course. The instructors were mentioned most often when participants were asked what was their favorite part of the computer course. One participant wrote, "Patient and knowledgeable instructor and coaches." Students often expressed how patient the instructors were. Students also enjoyed the personal attention given to the students by the instructors. Another student wrote, "The instructors were very helpful showing me what to do."

Some participants (n = 2) stated that the learning experience was their favorite part of the class. One participant wrote, "Enjoyed learning the basics." Participants were satisfied with their first computer learning experience. Participants also valued the course material they were provided with during the class. A class participant wrote, "Instruction books and floppy disks were helpful for practicing at home."

The students were also very satisfied with the pace of the course. Research has indicated that it may take an older population longer to learn computer skills (Jones & Bayen, 1998). SeniorNet classes offer a slow paced course where questions and hands on training are emphasized. A participant wrote, "The class went slow enough for me to take notes."

Learning to use the computer can feel foreign and threatening, but the classes at SeniorNet are specifically designed to be senior friendly. One participant felt that the SeniorNet classes offered a safe environment to teach computer basics. When asked what he/she liked most about the SeniorNet computer class, the participant wrote, "Did not feel intimidated."

There were very few things the participants disliked about the class. Two participants reported that they would like the class to be longer. These individuals did not feel that eight weeks was long enough to learn the course material. One participant did not enjoy getting up early for the morning class.

Participants were allowed to write additional comments at the end of the course evaluation form. Participants expressed gratitude for the chance to learn new skills, the instructors, the social experience, and the course content. Some participants (n = 4) described the computer course as a "valuable learning experience." One participant stated, "It opened a whole new world for me."

Other participants (n = 3) made additional comments regarding the teachers and instructors in the class. Participants discussed the instructor's expertise. One participant wrote, "Teacher is well prepared and knowledgeable." Class participants also felt confident in their instructor's computer and teaching skills. A participant stated, "I really enjoyed and appreciated the instructors."

One participant enjoyed the social aspects related to the computer course. This individual used this course to

gain new meaningful relationships. The participant stated, "The class was great! I really enjoyed it and I made some new friends."

Another class participant was also satisfied with the course content and the pace of the class. He/She was grateful that the class was slow-paced for new computer users. This participant wrote, "The program is well structured for beginners."

CHAPTER V

DISCUSSION AND CONCLUSIONS

Conclusions

The results of an Independent t-test indicated a statistically significant difference between the two studied groups in the area of years of education. The test showed that the experimental group had completed more years of education than the control group. Previous research had indicated that individuals with higher levels of education were more likely to have higher levels of life satisfaction (Crandall, 1980; Brockett, 1987). This did not appear to be the case in this study. Both groups showed comparative levels of self-esteem and life satisfaction despite years of education. This may be due to both groups participating in valued activities rather than educational levels.

As the results indicated life satisfaction for both the control and experimental group rose slightly, but was not statistically significant. Therefore it is impossible to say that the SeniorNet computer training course helped to increase aged individuals' life satisfaction. These results may indicate that any sort of meaningful activity (either participating in a computer class or involvement in

social activities at a senior community center) may increase an individuals' life satisfaction.

The results indicated that self-esteem for the experimental group rose slightly after receiving computer training; however, these results were not statistically significant. It could be possible that the sense of mastery over a subject may have increased the participant's self-esteem, as stated in the study by Hoot and Hayslip (1983). This may be a topic for future research.

Although the slight increase in self-esteem is certainly not statistically significant it does lend some credence to the study that was conducted by Billipp (2001) regarding computer usage and increased self-esteem among an aged population. It also supports the research findings of Kautzmann (1990) and Eilers (1989), which detailed perceived increased self-esteem among aged computer users.

Qualitative data collected from participants throughout the study did correspond to qualitative data received in previous studies. Participants in this study indicated that they had chosen to participate in the computer training at SeniorNet for numerous reasons. These reasons included educational experience, staying current with the times, finding a job, entertainment, and

communication. These reasons correspond with a study Eilers (1989) conducted. He asked participants to describe why the subjects had participated in a computer training course. Their responses were very similar to the responses of the participants in this study. Their responses included learning new skills, practical reasons, such as obtaining employment, staying current with the times, and finding a new hobby.

Through this study it also appeared based on the participants' responses to open-ended questions that the individuals had a positive attitude toward computer technology and learning about computer technology. This was also evidenced in a study by Irizarry and Downing (1997) where individuals stated positive responses toward computer technology. These findings help to dispute the notion that aged individuals are afraid of learning about computer technology.

Of the participants who filled out feedback forms at the end of the SeniorNet computer training course, nearly all stated that they would like more computer training. This corresponds with findings from Zemke (1996), Farris, Bates, Resnick, and Stabler (1994), and Hollander and Plummer (1986). These studies stated that participants

often found computer training fun, challenging, and most also wanted more computer training.

The results of this study can be utilized in applied settings. Based on the qualitative data that was received during this study, it may be beneficial for senior citizen centers, nursing homes, and assisted living settings to incorporate computer training into their activities. Having computer technology available to individuals in these settings may meet needs for life long learning and social involvement. Mastery of such skills may lead to increases in self-esteem and life satisfaction.

The results of this study lend credibility to activity theory. Both the experimental and the control groups presented on the pretests with high self-esteem and life satisfaction in this study. This may be to activity theory. Activity theory states that individuals remain happy into retirement age by remaining active. Both groups were active. The control group participated in senior citizen activities and the experimental group participated in a computer training course. Perhaps remaining active in meaningful activities, whatever that may be for individuals, is the secret to high self-esteem and life satisfaction.

Limitations

Limitations of this study include a poor response rate causing a small sample size and reducing power of the statistical analysis to detect true differences should they exist. The researcher found that this is a difficult population to collect data from. Many participants dropped out of the computer course before complete data could be collected due to medical problems, vacations, difficulty finding transportation, family obligations, and lack of interest.

Another limitation of this study was the use of surveys that relied upon self-report. Both the LSI-Z and the RSE are self-report measures. It is often socially desirable to have high self-esteem and a high sense of life satisfaction. Participants may have rated themselves higher on these variables than they were actually experiencing. It may have been nice to include a partner's or family member's perception of the participant's self-esteem and life satisfaction during this study.

A threat to internal validity is evident through the process of self-selection due to nonrandom assignment of participants. The subjects in this study self-selected themselves to participate in this research project. The

individuals who chose to participate may be different from the individuals who chose not to participate in this study. It may be that the individuals who participated in this study already had high levels of self-esteem and life satisfaction. This causes concerns with the generalizability of the study. This research is only generalizable to the individuals who were subjects of this research project.

Individuals in this study had very high self-esteem and life satisfaction scores at the beginning of the study. This can pose a ceiling effect. This means that changes in self-esteem and life satisfaction were not detected because these participants' scores were very high at the beginning of the study. There was little variation in scores to detect any true differences.

A potential threat to internal validity may also pose a problem with the study's results. Several different instructors throughout the study taught students in the SeniorNet computer course. Students did not have the continuity of one instructor. Each instructor taught the same lessons and material, but individual differences related to an instructor's teaching style or personality might have impacted self-esteem and life satisfaction

scores. A student of the course may have enjoyed a particular instructor, inflating that student's self-esteem or life satisfaction. On the other hand, a student may have disliked a particular instructor negatively impacting self-esteem and life satisfaction scores.

After each of the eight computer training classes, participants of the course were originally asked to provide a written response to three written questions. These questions were as follows:

1. How did you feel about today's class?
2. What did you personally learn about yourself today?
3. Were you pleased with your progress today? Why?

These questions were to allow for tracking of participant progress between computer classes. This information was to provide process data to enrich the outcome data collected. Unfortunately, the SeniorNet instructors chose not to give the questions to the participants. The instructors felt that these questions may prove to be burdensome to administer during an already busy two-hour class. Instructors also stated that they generally do not give class participants homework assignments, and saw the questions as homework assignments after each class. Luckily, the researcher was able to obtain some impressive

qualitative data from the participant demographic form and course evaluation form; however, this did not provide the between class process data that was hoped for.

Future Research

Recommendations for further research include use of larger sample sizes, although this can be challenging to accomplish with the population being studied. Further research may also include distribution of the surveys to SeniorNet organizations around the country rather than being limited to one SeniorNet center. This would increase the generalizability of the results. Future studies may also rely on the use of a partner or family member to describe the participant's self-esteem and life satisfaction prior to the beginning of the study and again at the end. This would provide additional data to compliment information obtained on the self-report measures.

In the future it may also be beneficial to obtain process data from participants after each computer class. This could be in the form of a short interview or a questionnaire. This information would prove useful to help understand the process an individual goes through that enhances self-esteem and life satisfaction or the process

an individual goes through to maintain high self-esteem and life satisfaction, especially when faced with the assimilation of new information.

Future researchers may also want to decrease threats to internal validity by standardizing computer course teaching procedures. The participants in this study were taught the same material, but instructors were allowed to do so in accordance with their own teaching style. This variable could be better controlled through manualized procedures that would ensure that both instructors and course material were the same in each class.

Studies within the gerontology sector need to rely more heavily on randomized assignment of participants. As the researcher has found, this can be undeniably difficult. Nevertheless, this would increase the generalizability of research results dramatically and contribute to a slowly growing body of knowledge regarding the older population. Random assignment would also decrease the following threats to internal validity: (a) selection, (b) maturation, and (c) selection-maturation interaction.

Future research may also consider focusing on an older, more homebound population. The participants recruited for this study were relatively healthy, and

independently living. Results of this study may have been different with an older adult population.

Finally, future researchers may want to consider measuring different variables amongst the aged computer using population. These variables could include loneliness, sociability, locus of control, and levels of anxiety. There are many variables besides self-esteem and life satisfaction that may be affected by computer technology usage.

Summary

This study attempted to gauge self-esteem and life satisfaction of aged computer users compared to an older population who did not actively engage in computer usage. As the results indicated life satisfaction for both the control and experimental group rose slightly, but was not statistically significant. Therefore it is impossible to say that the SeniorNet computer training course helped to increase aged individuals' life satisfaction. These results may indicate that any sort of meaningful activity (either participating in a computer class or involvement in social activities at a senior community center) may increase an individuals' life satisfaction.

The results also indicated that self-esteem for the experimental group rose slightly after receiving computer training; however, these results were not statistically significant. It could be possible that the sense of mastery over a subject may have increased the participant's self-esteem, as stated in the study by Hoot and Hayslip (1983). Further research needs to be conducted on this population, and such research may enhance an aging population's outlook on life and themselves.

REFERENCES

- Adler, R. (1988). *SeniorNet: Toward a national community of computer-using seniors*. New York: Aspen Institute.
- Adler, R. P. (1996). Older adults and computers: Report of a national survey. Retrieved April 10, 2002, <http://www.seniornet.org/research/survey2.html>
- Aiken, L. R. (1982). *Later life* (2nd ed.). New York: CBS College Publishing.
- Ansley, J., & Erber, J. T. (1988). Computer interaction effect on attitudes and performance in older adults. *Educational Gerontology, 14*, 107-119.
- Ashford, J. B., LeCroy, C. W., & Lortie, K. L. (1997). *Developmental psychology, social psychology*. Pacific Grove: CA. Brooks Publishing.
- Bagley, S. P., & Williams, T. F. (1988). Technology and aging: The new frontier. In G. Lesnoff-Caravaglia (Ed.), *Aging in a technological society* (pp. 147-161). New York: Human Sciences Press.
- Baldi, R. A. (1997). Training older adults to use the computer: Issues related to the workplace, attitudes, and training. *Educational Gerontology, 23*(5), 453-465.

- Bikson, K. L., & Bikson, T. K. (2001). The impact of Internet use over time on older adults: A field experiment. In N. Charness, D. C. Parks, & B. A. Sable (Eds.), *Communication, technology, and aging: Opportunities and challenges for the future* (pp. 60-78). New York: Springer Publishing Company.
- Bikson, T. K. & Panis, C. (1999). *Citizens, computers and connectivity: A review of trends*. Santa Monica, CA: Rand Corporation.
- Billipp, S. H. (2001). The psychosocial impact of interactive computer use within a vulnerable elderly population: A report on a randomized prospective trial in a home health care setting. *Public Health Nursing, 18(2)*, 138-145.
- Blascovich, J., & Tomaka, J. (1991). Measures of self-esteem. In J. P. Robinson, P. R. Shaver, & L. S. Wrightsman (Eds.), *Measures of personality and social psychological attitudes* (pp. 115-160). San Diego, CA: Academic Press.
- Bogan, J. (1988). The assessment of self-esteem: A cautionary note. *Australian Psychologist, 23(3)*, 383-389.

- Breakwell, G. M., & Fife-Schaw, C. (1988). Ageing and the impact of new technology. *Social Behaviour, 3*, 119-130.
- Breytspraack, L. M., & George, L. K. (1979). Measurement of self-concept and self-esteem in older people: State of the art. *Experimental Aging Research, 5*(2), 137-148.
- Brickfield, C. F. (1984). Attitudes and perceptions of older people toward technology. In P. K. Robinson, J. Livingston, & J. E. Birren (Eds.), *Aging and technological advances* (pp. 31-38). New York: Plenum.
- Brockett, R. (1987). Life satisfaction and learner self-direction: Enhancing quality of life during the later years. *Educational Gerontology, 13*, 225-237.
- Brown, T. S., Brown, J. T., & Baack, S. A. (1990). Attitudes of the elderly toward computers. *The Journal of Computer Information Systems, 7*, 28-33.
- Butler, R. (1969). Ageism: Another form of bigotry. *The Gerontologist, 9*, 243-246.
- Carstensen, L., L. (1998). A life-span approach to social motivation. In J. Heckhausen, & C. S. Dweck (Eds.), *Motivation and self-regulation across the life-span* (pp. 341-364). Cambridge, MA: University Press.

- Cohen, S., & Wills, T. (1985). Stress, social support and the buffering hypothesis. *Psychological Bulletin*, 98, 310-357.
- Crandall, R. C. (1980). *Gerontology: A behavioral science approach*. Reading, MA: Addison-Wesley Publishing Company.
- Czaja, S. J., Guerrier, J., Nair, S., & Landauer, T. K. (1993). Computer communication as an aid to independence for older adults. *Behaviour & Information Technology*, 12(4), 197-207.
- Eilers, M. L. (1989). Older adults and computer education: Not to have a closed door. *International Journal of Technology and Aging*, 2(1), 57-76.
- Elmore, R. (1999). Education for older people: The moral dimension. *Education and Ageing*, 14(1), 9-20.
- Farris, M., Bates, R., Resnick, H., & Stabler, N. (1994). Evaluation of computer games' impact upon cognitively impaired frail elderly. *Electronic Tools For Social Work Practice and Education*, 11, 219-228.
- Festervand, T. A., & Wylde, M. A. (1988). The marketing of technology to older adults. *International Journal of Aging and Technology*, 1, 156-162.

- Fisher, S. (1986). Increasing participation with a computer in an adult day care setting. *Activities, Adaptation, and Aging, 6*, 31-36.
- Furlong, M. (1989). Crafting an electronic community: The SeniorNet story. *International Journal of Technology and Aging, 2*(2), 125-134.
- Furlong, M. & Kearsley, G. (1986). Computer instruction for older adults. *Generations, 11*(1), 32-34.
- Gilberts, R. (1983). The evaluation of self-esteem. *Family and Community Health, 6*(2), 29-49.
- Glaus, K. (1999). Measuring self-esteem. In J. S. Carlock (Ed.), *Enhancing self-esteem* (pp. 457-475). (3rd ed.). Ann Arbor, MI: Edwards Brothers.
- Griffiths, A. (1997). Ageing, health and productivity: A challenge for the new millennium. *Work and Stress, 11*, 197-214.
- Henderson, V. L., & Dweck, C. S. (1990). Motivation and achievement. In S. S. Feldman, & G. R. Elliott (Eds.), *At the threshold: The developing adolescent* (pp.308-329). Cambridge, MA: Harvard University Press.
- Heppner, P. P., Kivlighan, D. M., & Wampold, B. E. (1999). *Research design in counseling*. New York: Brooks/Cole.

- Herzog, A.R., & House, J.S. (1991). Productive activities and aging well. *Generations*, 15, 49-54.
- Hollander, E. K., & Plummer, H. R. (1986). An innovative therapy and enrichment program for senior adults utilizing the personal computer. *Activities, Adaptation, and Aging*, 6, 59-68.
- Hoot, J. L., & Hayslip, B. (1983). Microcomputers and the elderly: New directions for self-sufficiency and life-long learning. *Educational Gerontology*, 9, 493-499.
- Irizzary, C., & Downing, A. (1997). Computers enhancing the lives of older people. *Australian Journal on Ageing*, 16, 351-354.
- Jay, G., & Willis, S. (1992). Influence of direct computer experience on older adults' attitudes toward computers. *Journal of Gerontology*, 47(4), 250-257.
- Kautzmann, L. N. (1990). Introducing computers to the elderly. *Physical and Occupational Therapy in Geriatrics*, 9(1), 27-36.
- Kaye, S. H. (2000). *Computer and Internet use among people with disabilities*. (Disability Statistics Report No. 13). San Francisco, CA: California University, Disability Statistics Center.

- Kearsley, G., & Furlong, M. (1984). *Computers for kids over 60*. Reading, MA: Addison-Wesley.
- Kerschner, P. A., & Hart, K. C. (1984). The aged user and technology. In R. E. Dunkle, M. R. Haug, & M. Roesenberg (Eds.), *Communications technology and the elderly: Issues and forecasts* (pp.135-144). New York: Springer.
- Krauss, I. K., & Hoyer, W. J. (1984). Technology and the older person: Age, sex, and experience as moderators of attitudes towards computers. In P. K. Robinson, J. Livingston, & J. E. Birren (Eds.), *Aging and technological advances* (pp. 349-350). New York: Plenum.
- Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukopadhyay, T., & Scherlis, W. (1998). A social technology that reduces social involvement and psychological well-being. *American Psychologist*, 53(9), 1017-1031.
- Lawhorn, T., Ennis, D., & Lawhorn, D.C. (1996). Senior adults and computers in the 1990's. *Educational Gerontology*, 22(2), 193-201.

- Lemon, B. W., Bengston, V. L., & Peterson, J. A. (1972). An exploration of the activity theory of aging: Activity types and life satisfaction among in-movers to a retirement community. *Journal of Gerontology, 27*, 511-523.
- Lesnoff-Caravaglia, G. (1989). Old age, ancient attitudes and advanced technology. *Ageing and Society, 9*, 73-77.
- Manheimer, R. J., Snodgrass, D. D., & Moskow-McKenzie, D. (1995). *Older adult education*. Westport, CT: Greenwood Press.
- Marquie, J. C., Jourdan-Boddaert, L., & Huet, N. (2002). Do older adults underestimate their actual computer knowledge? *Behaviour & Information Technology, 21*(4), 273-280.
- Morris, J. M. (1984). Computer training needs of older adults. *Educational Gerontology, 20*, 541-555.
- Neugarten, B. L., Havighurst, R. J., & Tobin, S. S. (1961). The measurement of life satisfaction. *Journal of Gerontology, 16*, 134-143.
- Noer, M. (1995). Senior cybernatus. *Forbes, 159*(7), 240.

- Nussbaum, J. F., Pecchioni, L. L., Robinson, J. D., & Thompson, T. L. (2000). *Communication and aging*. (2nd ed.). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.
- Ogozalek, V. Z. (1991). The social impacts of computing: Computer technology and the graying of America. *Social Science Computer Review*, 9(4), 655-667.
- Opalinski, L. (2001). Older adults and the digital divide: Assessing results of a web-based survey. *Journal of Technology in Human Services*, 18(3/4), 203-221.
- Oyer, H. J., & Oyer, E. J. (1976). *Aging and communication*. Baltimore, MA: University Park Press.
- Peterson, D., Thornton, J., & Birren, J.E. (1986). *Education and aging*. New York: Prentice Hall.
- Pollack, A. (1990, April 11). Megabytes and floppy disks snare novices in an older generation. *New York Times*, pp. C1, C4.
- Quandango, J., & Hardy, M. (1996). Work and retirement. In R. H. Binstock, & L. K. George (Eds.), *Handbook of aging and the social sciences* (pp. 325-345). San Diego, CA: Academic Press.
- Randall, V. (1982). *Women and politics*. London: Macmillan.

- Rosenberg, M. (1987). Rosenberg self-esteem scale (SES). In K. Corcoran, & J. Fischer (Eds.), *Measures of clinical practice* (pp. 408-409). New York: Free Press.
- Ryan, E. B., & Heaven, R. K. (1986). Promoting vitality among older adults with computers. *Activities, Adaptation, and Aging*, 6, 15-29.
- Ryan, E. B., Szechtman, B., & Bodkin, J. (1992). Attitudes toward younger and older adults learning to use computers. *Journal of Gerontology*, 47(2), 96-101.
- Seeman, T., Kaplan, G., Knudson, L., Cohen, R., & Guralnik, J. (1987). Social network ties and mortality among the elderly in the Alameda County study. *Journal of Epidemiology*, 126, 714-723.
- Skeet, M. (1982). *The third age*. London: Danton, Longman, and Todd.
- Stagner, R. (1985). Aging in industry. In J. E. Birren & K. W. Schaie (Eds.), *Handbook of the psychology of aging* (pp. 789-817). New York: Van Nostrand-Reinhold.
- Thompson, M. (1995, September). *Computer technology: How it impacts the lives of older adults*. Paper presented at the meeting of the Ageing International, Jerusalem, Israel.

- Truluck, J., & Courtenay, B. (1999). Learning style preferences among older adults. *Educational Gerontology* 25(2), 221-236.
- U.S. Census (2000). Census population estimates 60+ by 5 year age group. Retrieved June 1, 2003, www.census.gov
- Weber, H., Zimmermann, G, & Zink, K. (1995). Computer access for people with special needs. *Widening Communications*, 12 (1-2), 151-168.
- Weisman, S. (1983). Computer games for the elderly. *Gerontologist*, 23, 361-363.
- Wells, I. W., & Marwell, G. (1976). *Self-esteem: Its conceptualization and measurement*. Beverly Hills, CA: Sage Publications.
- White, H., McConnell, E., Clipp, E., Bynum, L., Teague, C., Navas, L., Craven, S., & Halbrecht, H. (1999). Surfing the net in later life: A review of the literature and pilot study of the computer use and quality of life. *Journal of Applied Gerontology*, 18(3), 358-378.
- Williams, L. M. (1978). A concept of loneliness in the elderly. *Journal of American Geriatrics Society*, 26(4), 183-187.
- Woodbury, R. G. (1999). Early retirement in the United States. *Statistical Bulletin*, 80(3), 2-7.

- Zemke, R. (1986). Taking a byte of the apple: Computer activities in a senior day care center. *Physical and Occupational Therapy in Geriatrics*, 4(2), 39-49.
- Zimmer, Z. & Chappell, N. (1999). Receptivity to new technology among older adults. *Disability and Rehabilitation*, 21(5/6), 222-230.

APPENDIX A

ROSENBERG SELF-ESTEEM SCALE

1. On the whole, I am satisfied with myself.

Strongly Agree Agree Disagree Strongly Disagree

2. At times I think I am no good at all.

Strongly Agree Agree Disagree Strongly Disagree

3. I feel I have a number of qualities.

Strongly Agree Agree Disagree Strongly Disagree

4. I am able to do things as well as most people.

Strongly Agree Agree Disagree Strongly Disagree

5. I feel I do not have much to be proud of.

Strongly Agree Agree Disagree Strongly Disagree

6. I certainly feel useless at times.

Strongly Agree Agree Disagree Strongly Disagree

7. I feel that I am a person of worth, at least on an equal
plane with others.

Strongly Agree Agree Disagree Strongly Disagree

8. I wish I could have more respect for myself.

Strongly Agree Agree Disagree Strongly Disagree

9. All in all, I am inclined to feel that I am a failure.

Strongly Agree Agree Disagree Strongly Disagree

10. I take a positive attitude toward myself.

Strongly Agree Agree Disagree Strongly Disagree

18. In spite of what people say, the lot of the average man is getting worse, not better.

Agree

Unsure

Disagree

APPENDIX C

INFORMED CONSENT FOR PARTICIPATION IN RESEARCH STUDY

I have been asked to participate in a research study conducted by Cindy Brown, doctoral student in the Counseling Psychology program at Texas A&M University. The study is entitled Self-esteem and Life Satisfaction of Aged Individuals With and Without Access to Computer Training, and will allow Cindy Brown to meet her dissertation requirement to graduate. The overall purpose of this research is to determine the effects of computer training on self-esteem and life satisfaction of senior citizens involving approximately 90 subjects. I understand I was chosen to participate because I signed up for a computer training course at a SeniorNet computer training center and I am older than 50 years of age. If I choose to participate in this research study, my participation will involve completing an eight-week computer course at a SeniorNet center in Texas. To participate I am also required to fill out a self-esteem questionnaire, and life satisfaction questionnaire on two separate occasions, once at the beginning of the computer course and again at the end of the training course. A demographics form will be administered at the beginning of the computer training

course. The questionnaires will take approximately 20 minutes to complete. I understand that there are minimal risks or discomforts that might be associated with this research. It is possible that some questions may be uncomfortable to answer due to their sensitive nature. I understand that the possible benefits to myself or others from this research include the possibility of increased computer training courses at local senior citizen centers. There is no compensation for my participation. I may choose not to participate in this research. I understand that my participation is voluntary and that if I choose to participate I may withdraw my consent and discontinue participation in this research project at any time without penalty. I have the right to refuse to answer any questions that makes me feel uncomfortable. All questionnaires will be coded and kept confidential. I understand that the investigator or her dissertation supervisor is willing to answer any inquiries I may have concerning the research study described.

Cindy Brown, M.S.
8050 Oakdell Way #2406
San Antonio, TX 78240
(210) 558-4474
cab6978@hotmail.com

David Lawson, Ph.D.
720 Harrington Tower
Texas A&M University
College Station, TX 77843
(979) 845-7250
d-lawson@tamu.edu

I understand that this research study has been reviewed and approved by the Institutional Review Board-Human Subjects in Research, Texas A&M University. For research-related problems or questions regarding subjects' rights, I can contact the Institutional Review Board through Dr. Richard E. Miller, IRB Coordinator, Office of Vice President for Research at (979) 845-8585 (e-mail: rich-miller@tamu.edu).

I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study. I have been given a copy of this consent form.

Participant's Signature

Date

Principal Investigator's Signature

Date

APPENDIX D

POSTED NOTICE TO CONTROL GROUP

1. Are you 50 years of age or older?
2. Are you computer illiterate?

If you answered, "yes" to both questions, I would like to invite you to participate in an exciting research project measuring self-esteem and life satisfaction of individuals with and without access to computer technology. You can participate without leaving your home. If you would be willing to take 20 minutes to fill out surveys on two different occasions, I will mail the surveys right to your home. Benefits of this research include the possibility of increasing senior citizen technology activities within your community. Sorry, there is no compensation for this study. If you would like to participate, please add your name and address to the following list or contact:

Cindy Brown (Principal Investigator)
8050 Oakdell Way #2406
San Antonio, TX 78240
(210) 558-4474

APPENDIX E

LETTER MAILED TO CONTROL SUBJECTS

Dear Participant:

My name is Cindy Brown. I am a doctoral student in the Counseling Psychology program at Texas A&M University. I am conducting a research study about the effects of computer technology on the self-esteem and life satisfaction of senior citizens. I am hoping you will agree to serve as a member of my control group. This is a group of 45 individuals who will not receive computer training within the next six months. The control group will be compared to an experimental group who enrolled in computer training at a senior citizen's center. Both groups will be administered the attached questionnaires on two separate occasions. Once at this present date and again in eight weeks to identify changes in self-esteem and life satisfaction.

To participate in this study, I am asking you to fill out the attached questionnaires. The questionnaires include a measure of self-esteem, life satisfaction, and a demographics sheet. These forms should take no more than 20 minutes to complete. There are minimal risks involved in

participating in this study. Risks include possible emotional discomfort related to filling out questionnaires pertaining to sensitive information. Benefits of participation include the possibility of increased computer training courses offered at local senior citizen centers. You have the right to withdraw from participating in this study at any time with no repercussions. You have the right to refuse to answer any questions that make you feel uncomfortable. There is no compensation offered for participating in this research study. All information obtained will be coded and kept confidential, never to be identified with your name.

If you are interested in participating in this exciting research study, please fill out the attached questionnaires. Once you have filled out the questionnaires, please mail the questionnaires back to me, using the provided self-addressed, stamped envelope. By filling out and returning this questionnaire you are providing your consent to participate in this research.

I appreciate your cooperation and help with this study. If you have any questions about this study, you can contact my

dissertation advisor or me. This research study has been reviewed and approved by the Institutional Review Board-Human Subjects in Research, Texas A&M University. For research related problems or questions regarding subjects' rights, you can contact the Institutional Review Board through Dr. Richard E. Miller, IRB Coordinator, Office of Vice President for Research at (979) 845-8585 (e-mail: rich-miller@tamu.edu).

Cindy Brown, M.S.
8050 Oakdell Way #2406
San Antonio, TX 78240
(210) 558-4474
cab6978@hotmail.com

David Lawson, Ph.D.
720 Harrington Tower
Texas A&M University
College Station, TX 77843
(979) 845-7250
d-lawson@tamu.edu

APPENDIX F
DEMOGRAPHIC FORM

Name _____ Age _____ Gender _____

Ethnicity _____

Please circle one response:

How many years of schooling did you receive: 5 6 7 8 9

10 11 12 13 14 15 16 17 18+

I am currently : Married Single Divorced Widowed

My average income is:

0-10,000

10,001-25,000

25,001-40,000

40,001-55,000

55,001-75,000

75,001-100,000

100,001+

I am currently: Employed Unemployed Retired

How much have you used the computer prior to this computer training course?

___ Never used a computer

___ I can play games on the computer

___ I can use the computer for word processing

___ I can use an e-mail account

___ I can use the Internet

___ Other (please define)

Why did you decide to enroll in this computer training course?

Do you have a computer at home?

What are your current hobbies?

APPENDIX G

COURSE EVALUATION FORM

Please complete this evaluation and leave it on the table in the middle of the room. Your feedback (both positive and negative) will help us improve the class and the facility. Thank you, we appreciate your help.

Please circle the answer that best describes your opinion.

1. Was the course content?

Too Elementary Too Advanced About Right

2. Was the course length (8 weeks)?

Too Short Too Long About Right

3. If a more advanced class were offered, would you be interested?

Yes No

4. Do you have a computer at home?

Yes No

5. If yes, were you able to apply the skills you learned?

Yes No

6. Would you recommend the course to a friend?

Yes No

How would you rate the following: 1 = Poor 5 = Excellent

1. The instructor's knowledge of the material? 1 2 3 4 5

2. The instructor as a teacher? 1 2 3 4 5

3. The computers and lab facility 1 2 3 4 5

What did you like most about the course?

What did you like least about the course?

Other Comments:

Your Name (Optional): _____

VITA

Cindy Ann Brown

Home Address:

8050 Oakdell Way #2406
San Antonio, TX 78240
(210) 558-4474

E-mail: cindy.brown@lackland.af.mil

Education:

12/04	Doctor of Philosophy Counseling Psychology, Ph.D. Program Texas A&M University, College Station, Texas
5/98	Master of Science Counseling Psychology University of Kansas, Lawrence, Kansas Graduated Cum Laude
5/96	Bachelor of Science Major: Psychology Minor: Biology Northwest Missouri State University, Maryville, Missouri Graduated Cum Laude