

UNDERSTANDING AND HELPING THE LONELY:
AN EVALUATION OF THE LUV PROGRAM

BY

SEAN SHIRAZ SEEPERSAD

B.S., University of the West Indies, 1997
M.S., University of Illinois at Urbana-Champaign, 2001

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ABSTRACT

The objective of this study was to create, implement, and evaluate a loneliness intervention program for college students. Loneliness is particularly prevalent among young adults, ages 18-25, and is associated with poor mental health. The program, known as the LUV (Lonely? Unburdening your Vulnerability) program, was based upon recommendations by loneliness researchers and previous intervention research. The program sought to address three causes of loneliness: insecure attachment styles (including dysfunctional cognitive patterns), poor social skills, and ineffective coping through a structured group environment. The program was a seven week psycho-educational program. The program had five main activities: program information modules, assignments, weekly discussions, journaling, and an online reference.

The program effectiveness component of the evaluation assessed whether the experimental group made significantly greater improvements than the control groups and if these improvements were sustained 4-5 months after the program ended. There were 16 participants in the experimental group and 358 participants in the control group. Results found that the experimental group had significant decreases in loneliness, improvements in their attachment styles and social skills, reductions in negative coping, decreases in depression and alcohol abuse, and increases in self-esteem when compared to the control groups. These changes were sustained 4-5 months after the program ended except for ruminative coping.

The program monitoring component of the evaluation assessed whether the program functioned as intended. Results showed high scores for program performance including relevance of the topics covered, usefulness of the social skills taught, satisfaction with the program, feelings of closeness with group members, and the effectiveness of the facilitator. On average, participants only missed one out of the seven weekly meetings. In addition, participants

reported feeling less lonely, less sad, increased confidence in meeting new people, and satisfaction with themselves as they progressed through the program.

These results suggested that a loneliness intervention program geared towards addressing these three problem areas of attachment styles, social skills, and coping can help young adults not only significantly reduce their loneliness and improve in these problem areas, but also show improvements in other areas such as depression, alcohol abuse, and self esteem.

To my Father, a man who started a tradition.

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CHAPTER 1: INTRODUCTION

The Societal Problem Of Loneliness

Loneliness is a pervasive phenomenon extending throughout American society and the world. The World Values Survey (Stack, 1995) ranks the U.S. as the fourth loneliest population among industrialized, Western nations. Estimates suggest national rates of loneliness range from 25% to just over 50% (Burns, 1985; Rubenstein & Shaver, 1982b, Weiss, 1973). Gordon (1976) states “knowing no limits of class, race, or age, loneliness is today a great leveler, a new American tradition” (p. 16).

The pervasiveness of loneliness is worrisome not only because it could be considered a negative state but also because of its association to poor mental health (Kupersmidt, Sigda, Sedikides, & Voegler, 1999; Perlman & Peplau, 1984) especially for youth and young adults. Kupersmidt et al. (1999) have cited research linking loneliness with emotional problems (low self-esteem, depression and social anxiety), social problems (peer rejection and victimization, lack of friendships and lack of high-quality friendships) and behavioral problems (shyness, social withdrawal, spending more time alone, dating infrequency and decreased participation in religious and extracurricular school activities). Perlman and Landolt (1999) provide further research examples of associations between loneliness and other psychosocial problems such as, physical illness, suicide, alcohol use, poor psychological adjustment, aggression, low grades in university and stealing and vandalism.

Research suggests that those persons ages 18-25 may be most at risk for loneliness (Perlman & Peplau, 1984). A meta-analysis of six US and Canadian surveys (N=18,682) have found that persons ages 18-25 had the highest self-report levels of loneliness among individuals

18 years and older (Perlman, 1991). Persons 18-25 therefore seem to be a population at greater risk of being lonely and should be targeted for intervention.

Despite the evidence that chronic feelings of loneliness are negative and should be treated, there has been little research on the best way to treat lonely individuals, especially with the most at risk age group, 18-25. A review of the current literature revealed that the few programs that exist for lonely young adults have either not been evaluated or are limited in their focus. In contrast, there has been comparably more literature by professionals and researchers on recommended elements loneliness intervention programs should have, including topics to address and procedures that can be used to help reduce loneliness.

This dissertation project sought to fill in the missing gap in loneliness research through the development and implementation of a loneliness intervention program that used a variety of strategies and focused on college students. The design of the program was created based upon recommended activities of professional and researchers in the field. The program aimed at reducing loneliness through cognitive restructuring, improving social skills, and teaching effective coping strategies in a structured group environment. In this way the project improved upon previous programs by using several different strategies (as opposed to using a single strategy) in helping to reduce loneliness. The project also evaluated the impact of the program including how much reduction in the level of loneliness occurred in participants. In doing this, more effective intervention programs can be constructed for lonely persons across a variety of demographics.

Recommendations And Other Previous Interventions

In considering what types of activities loneliness intervention programs should have, researchers have first focused on some of the causes of loneliness. Perlman and Peplau (1984)

have three broad categories of causes of loneliness: characteristics of the person, characteristics of the situation, and cultural values and norms. Rook (1984b) cites several research studies, which highlight several characteristics of persons that make them lonely and include: having dysfunctional beliefs (such as “I always get rejected in social situations”), a lack of social skills (such as knowing how to initiate contact, or assert themselves), and poor coping skills (such as ruminating or overeating). For Perlman and Peplau (1984) situational determinants that can create loneliness include such things as having limited mobility or being extremely busy. Perlman and Peplau (1984) also speculate that there are cultural determinants in creating loneliness, such as highly individualistic cultures.

Arising out of these causes of loneliness are several recommendations and intervention programs, which seek to address these causes of loneliness. Rook (1984b) for example, provides several recommended approaches to loneliness intervention programs including: changing characteristics of lonely persons (such as modifying dysfunctional beliefs, improving social skills, and enhancing coping with loneliness), and providing new opportunities for social contact.

There have also been a variety of intervention programs, which have addressed one of these specific causes of loneliness. McWhirter and Horan (1996) conducted an intervention program that sought to change the cognitive patterns of lonely persons (including modifying dysfunctional beliefs), an intervention program by Jones, Hobbs, & Hockenbury (1982) aimed at increasing college students’ social skills, and Van Buskirk (1991) ran an intervention program that sought to improve high students’ coping strategies. In addition there have been numerous programs aimed at providing new opportunities for social contact. There has been intervention research focused on seniors, especially female seniors, (Pitkala, Blomquist, Routasalo, & Saarenheimo, 2004; Stevens, 2001; Steward, Craig, MacPherson, & Alexander, 2001), and on

people with a physical illness such as cancer or brain-damage (Fukui, Koike, Ooba, & Uchitomi, 2003; Rowlands, 2002). These interventions have sought to reduce loneliness by enhancing participants' social networks through, for example, creating community groups. The following sections describe the causes of loneliness in more detail as well as intervention approaches to address these causes in more detail.

Cognitive-Behavioral Intervention

Several authors have speculated that one of the first steps towards the reduction of loneliness is helping individuals understand and change one cause of their loneliness - the cognitive patterns associated with lonely persons. In their research, Murphy and Kupshik (1992) for example, mention that lonely individuals tend to attribute their loneliness to false causes or tend to be unclear about what exactly in certain situations tend to trigger feelings of loneliness. Other authors (e.g. Burns, 1985; Rook, 1984a; Rook & Peplau, 1982) cite research showing that lonely individuals tend to have automatic thoughts that inhibit their ability to effectively function in social situations. For example, lonely people often assume that they will be rejected in social situations and therefore they do not make a concerted effort (if any) to engage in social interaction. Nurmi, Toivonen, Salmela-Aro, & Eronen (1997) in their study found that lonely individuals tend to exhibit a cognitive strategy called pessimistic avoidance which includes failure expectations, negative affects, avoidance, and self-handicapping. This pessimistic avoidance was related to the persistence of feelings of loneliness over a one-year period.

Another theoretical approach that features similar cognitive patterns in lonely persons (such as pessimistic avoidance) is the attachment style model. Research by Shaver and Hazan (1989) showed a link between attachment styles and loneliness. They found that individuals who had a secure attachment style felt significantly less lonely than those who had insecure

attachment styles (anxious-ambivalent and avoidant). Feeney, Noller, and Roberts (1999) suggest that this is because of the internal working models underlying the attachment styles. These internal working models help individuals predict what will happen in various social situations. Generally speaking, individuals with insecure attachment styles will have internal working models containing failure expectations, or that people cannot be trusted. Thus if a person is shifting from insecure styles of attachment to a more secure style of attachment, this may also mean that their internal working models or cognitive processes are containing less failure expectations or beliefs that people cannot be trusted.

While researchers such as Rook (1984a, 1984b) and Perlman and Peplau (1984) have made general recommendations that cognitive-behavioral issues need to be addressed, Young (1982) outlined a specific hypothetical intervention program and McWhirter and Horan (1996) tested an actual intervention program to address these issues. In particular, Young (1982) focused on the need for lonely individuals to understand the process of relationship development and maintenance. He outlines a possible cognitive intervention program that helps lonely individuals understand the barriers to relationship development from casual friendships to long-term emotional commitment. In a later study, McWhirter and Horan (1996) conducted an intervention program consisting of six meetings for two hours. The program aimed at issues of establishing and maintaining two types of relationships (friendships and intimate/romantic relationships) and used a variety of cognitive and behavioral techniques to address these issues. The investigators were also interested in determining whether a program aimed only at establishing and maintaining friendships would be more or less successful than one focused on romantic relationships. The results found that the program reduced participants' loneliness when the emphasis was on improving their friendships rather than on improving intimate/romantic

relationships. This study does provide some initial evidence that having a cognitive-behavioral component to a loneliness intervention program, where the emphasis is on friendships rather than intimate relationships, can be effective.

Social Skills Training

Other authors have recommended that a loneliness intervention program needs to help individuals develop their social skills. Several authors cite research showing that lonely individuals possess weak social skills that prevent them from establishing meaningful relationships with others, or exhibit behavior that cause them to be rejected by others (Duck, 1992; Jones et al., 1982; Rook, 1984a; Rook & Peplau, 1982; Murphy & Kupshik, 1992). Rook (1984b) for example cite research showing that lonely persons tend to have difficulty in introducing themselves to others, making phone calls to initiate social contact, participating in groups, enjoying themselves at parties, using self-disclosure and being responsive to others.

Jones et al. (1982) conducted an intervention program that aimed at increasing college students' social skills, specifically increasing the use of partner attention in social interactions. Partner attention is a type of social skill, which includes conversational behaviors directed towards the other conversational partner, such as asking questions or making statements about the partner. The program consisted of two 1½-hour sessions where participants were instructed on how to increase their use of partner attention. The results found decreases in loneliness for participants of the instruction group. A loneliness intervention program aimed at improving participants' social skills, therefore, may reduce their levels of loneliness.

Effective Coping Strategies

Several authors also recommend that loneliness intervention programs need to teach individuals how to adapt more effective coping strategies to deal with loneliness. Ruchkin,

Eisemann, & Hägglöf (1999) found in their research a strong relationship between feelings of loneliness and helplessness. This relationship may account for the passive and ruminative ways of coping by lonely individuals instead of more proactive, problem-solving coping strategies (Rokach & Brock, 1998; Rubenstein & Shaver, 1982a).

Ponzetti (1990) speculated that one important step for lonely individuals is helping them understand that their feelings of loneliness are controllable. So instead of reacting to their feelings of loneliness, lonely individuals can adopt a more proactive approach in reducing their loneliness via more effective coping strategies (such as getting a hobby). An intervention program by Van Buskirk (1991) sought to improve the way high school students coped with loneliness. It consisted of a single meeting, where students were presented with a stimuli situation of potentially lonely situations and then they had a semi-structured discussion led by the classroom teacher. The results found decreases in loneliness for 12th grade students but not 9th grade students. The non-depressed 12th grade students also reported using a greater degree of coping responses involving social contact. Emphasizing coping in a loneliness intervention program, therefore, may be effective in helping older adolescents reduce their loneliness.

Structured Group Interventions

Evans and Dingus (1989) provide evidence that a structured group intervention may be an effective setting in helping participants reduce their loneliness. They also state that attention to realistic and relevant issues is more effective than psychodynamically oriented approaches, which tend to focus more on understanding the historical origins of emotional problems. Using a psycho-educational approach, where participants are given information about loneliness and a forum for understanding and discussing the information, may make for a more effective program. The information would focus on experiences related to loneliness and ideas about how

these experiences occur. In addition, Evan and Dingus (1989) cite research examples showing that doing these activities in a group environment allows for reciprocal help and feedback among participants of the program, and may also motivate participants to continue with intervention activities. It also is in line with the other recommendation by Rook (1984b) in providing new opportunities for social contact.

Improving On Previous Interventions

Based on the factors that cause loneliness, several authors have recommended that a loneliness intervention program needs to focus on three main areas: cognitive-behavioral, social skills, and coping. In line with the recommendations by Evan & Dingus (1989) the program can focus on these three areas using a psycho-educational structured group setting.

There are several pieces of research, which provide some evidence that a loneliness intervention program focusing on any one of these areas alone can reduce significantly loneliness. There is, however, no research to date which attempts to combine all three into a cohesive intervention program. Combining these three approaches into one program may make for a more effective program by addressing multiple causes of loneliness. It is quite possible that a lonely person who avoids social situations because of automatic thoughts of rejection, may not have had the opportunity developed his/her social skills, and also may be negatively coping with loneliness. A program addressing all three of these issues may be more effective in helping such a person feel less lonely.

In an attempt to create a more effective program, this program went further than previous research by using multiple approaches to help reduce participants' level of loneliness. These approaches included: changing cognitive-behavioral patterns, having a social skills training, and utilizing effective coping strategies. The program was also longer than other previous

interventions and allowed for expanded activities for each approach. The evaluation procedures were also increased to include evaluating the program itself (formative evaluation). Therefore, while the program was being conducted, participants also assessed what they thought about different aspects of the program, such as if the social skills training is useful. This project therefore is an attempt to create a more comprehensive program along with more evaluation activities.

Evaluating The Loneliness Intervention Program

The loneliness intervention program was named the LUV program, LUV being an acronym for Lonely? Unburdening your Vulnerability. The program was a seven week program. It was developed as a psycho-educational program focusing on relevant and realistic issues lonely individuals have and the program was also conducted within a group setting.

The evaluation of this program aimed at assessing whether participants of the program showed changes for several variables. First, it is expected that participants would decrease in their feelings of loneliness. Second, since the program aimed at improving three problem areas, attachment styles (and underlying cognitive processes), social skills, and coping, it is expected that participants also show improvements in these areas. Improvements in these three problem areas (attachment styles, social skills, and coping) should mediate the decrease in loneliness, such that improvements in these areas are related to decreases in loneliness. This is because these three areas are seen as causes of loneliness and thus if they can be improved, then loneliness should also decrease. Third, it is possible that because there were decreases in loneliness, other established correlates of loneliness may show changes as well. Several of these are measured including depression, alcohol use and abuse, self-disclosure, and self-esteem.

The evaluation of this program has two main sections: program effectiveness and program monitoring. The program effectiveness section assessed changes in participants from the start of the program to the end of the program, and also about 4-5 months after the program has ended. Participants were assessed on measures of loneliness, along with targeted problem areas, attachment styles, social skills, and coping, and other outcome measures such as depression, alcohol use and abuse, self-disclosure, and self-esteem. The hypotheses related to program effectiveness are below:

1. There will be significantly greater decreases in the loneliness in the experimental group than the control group.
2. There will be improvements in target problem areas:
 - a. Participants in the experimental group vs. the control group, will report using more of the confidence attachment style and less use of discomfort, relationships as secondary, need for approval, and preoccupation attachment styles.
 - b. There will be significantly greater increases in social skills in the experimental group than the control group.
 - c. Participants in the experimental group vs. the control group, will report using more of constructive-active and emotion expression and social coping and less use of rumination and passive-avoidant coping.
3. There will be changes in correlates of loneliness:
 - a. There will be significantly greater decreases in depression, alcohol use and abuse in the experimental group than the control group.
 - b. There will be significantly greater increases in self-disclosure and self-esteem in the experimental group than the control group.

The program monitoring section of the evaluation investigated whether the program performed as intended. This section had three main components, which were assessed weekly for five weeks in the program: program performance, participants' level of participation, and week to week emotional states. The program performance and week to week emotional states also had a number of subcomponents. To evaluate whether the program functioned as intended the scores of the subcomponents were analyzed to determine their means, their trends across the five weeks, and how the scores varied by session (Fall or Spring). Generally speaking, if subcomponent scores were high or increasing across the five weeks, this would suggest that the program functioned as intended.

CHAPTER 2: METHODOLOGY

Procedures

In order to evaluate the LUV program, an experimental design was used. This experimental design involved two groups of participants: the experimental group, which consisted of the participants in the program, and a control group. Different recruitment procedures were used to obtain the two groups of participants. Unlike the experimental group that participated in the seven-week LUV program, the control group did not partake in a similar intervention. Below is a description of the procedures used with the experimental and control groups.

Experimental Group

Recruitment

Participants for the program were recruited through newspaper advertisements; flyers in classrooms, notice boards, and residence halls; brochures; emails; and through word of mouth.¹ Follow up questions with interested persons revealed that newspaper advertisements and flyers were the most common way that enrolled participants found out about the program.

Screening

The screening process consisted of two parts: part one involved answering an online screening questionnaire² and part two involved participating in a screening interview. Once a person was interested in being part of the program, they visited a screening website. The website contained a preliminary consent form and the screening questionnaire. The consent form provided information about the program and about the screening process (including both the online screening questionnaire and face-to-face screening interview) and required them to agree

¹ See Appendix A for advertisement samples

² See Appendix B for a copy of the screening questionnaire

to allow the researchers to use the information for research purposes in addition to the screening. If they agreed to the consent form, they were allowed to answer the online questionnaire. The online questionnaire contained the Counseling Concerns Survey used by the UIUC Counseling Center and the Revised UCLA Loneliness Scale. The Counseling Concerns Survey reviews specific experiences, which could indicate some degree of psychopathology and also asks for some demographic information, such as age, year in college, sex, and ethnicity. In addition to the Counseling Concerns Survey, the questionnaire also asked for contact information such as an email, telephone number, etc. Participants who completed the questionnaire were contacted and appointments were made for an interview screening.

The screening interviews were done in groups ranging from 3 to 5 people who answered the online questionnaire and was conducted by Dr. Thomas Seals and Sean Seepersad. Group screenings were audiotaped. The screening interviews along with data from the screening questionnaire helped determine if participants had the following elements in order to be enrolled in the program: 1. A moderate to chronic level of loneliness (i.e., they feel lonely frequently and have felt lonely for some time). 2. An ability to commit to the seven week program. 3. An acceptable range of previous and/or current diagnosed mental health or relationship problems, including previous and/or current counseling, psychotherapy, or prescribed psychotropic medication. 4. No severe current psychopathology, such as being suicidal, major depression, alcohol or substance abuse (especially if the person is not currently undergoing any counseling or therapy). 5. No severe and unresolved trauma history. 6. An acceptable interpersonal capacity to function as a group member. Subsequently after the screening meeting, participants were individually contacted and notified if they had been accepted into the program and when was the first meeting date. Using this screening method, only one person in the Fall session was deemed

not suitable for the program and referred to more appropriate services. No one was screened out in the Spring session.

Program Activities

There were five program activities for participants during the seven weeks when they were actively involved in the program:

Program Modules. Each week for five weeks, participants were given a program module, which was aimed at educating them about various theories and ideas associated with loneliness (such as attachment or coping), and helped them apply these theories to themselves. There were no program modules for the first and last weeks of the program. Participants were given hardcopies of the program modules at the meeting before the week when the discussion for the module was scheduled. However, participants also had the option of viewing the information online as well to ensure that participants who were absent the week the modules were distributed could receive a copy of the module. Information provided in the modules were obtained from research and popular publications based on loneliness and presented in a form that was easily readable, about a language level similar to that found in self-help books. The topics for modules were: The Experience of Loneliness, Aloneness vs. Loneliness: How do we cope?, The Public vs. The Private Self, Conceptions of Self and Other, Social Skills: Starting, Sustaining and Ending Relationships.³ Modules also had discussion questions designed to help participants reflect upon what they have read and apply the information provided to their lives.

Assignments. Every week participants were given assignments. The assignments were closely associated with the program module for that week, and were practical exercises that allowed participants to further explore ideas and concepts in the module. Assignments were presented at the weekly discussion meetings. For example, for week 4 of the program, the

³ See Appendix C for a participant syllabus

module dealt with social masks that people wear to hide their true inner selves. For that week, the assignment was a box exercise, where on the outside of the box they showed the self that everyone else sees, and the inside of the box contained things that were part of their inner selves.

Weekly discussions. Each week, for seven weeks, participants met collectively with the program facilitator. Meetings were approximately 2 hours long and took place in the Bevier Commons (in Bevier Hall) from 7-9 p.m. on Mondays during the Fall session and on Wednesdays during the Spring session. All weekly discussions were audiotaped. The format for weekly discussion was: check-in, developing listening and communication skills, discussion of the program module, and closing. The check-in consisted of participants going around and introducing themselves, describing experiences they had during the past week, and finally giving any highlights about things they learned in the program that they applied to their life (e.g., trying out a new listening skill and seeing how well it worked). During the session on developing listening and communication skills participants learned about and practiced different listening and communication skills. By practicing the listening and communication skills, participants were also given a chance to learn about other participants in the program. After that section was completed, participants were divided into smaller groups where they were allowed to discuss their reactions to the program module with one another. They also used that time to present assignments for that week as well. At the end of each meeting, participants were given a short weekly questionnaire to assess various facets of the program for that week. The closing also involved participants individually reporting on what they learned during the meeting and also saying one or more positive things that were going to commit to for the upcoming week. Generally, participants committed to trying to practice more listening and communication skills.

Journal. Participants were asked to keep a journal during their participation in the program and make entries at least every week. The journal contained their reactions to the program's weekly activities, that is, the program module, weekly discussions and assignments. The journal was also used to record other experiences and events in their lives apart from the program. Besides being useful as a data-collection tool, the journal had some therapeutic value as well, allowing participants time to introspect on the progress they were making in the program.

WebCT. This website provided additional resources for participants. It includes copies of the weekly modules, contact information for the program facilitator, the copy of the consent form, copies of the assignment instructions for that week, a space to submit their journal entries and also provided a personal space for them to post information about themselves.

Administration of Questionnaires

Pretest, Posttest, and Follow-Up Posttest. Three identical questionnaires were administered at three periods in time: the pretest was administered during the first week of program, the posttest was administered during the week following the end of the program, and the follow-up posttest was administered at the end of the semester (or about 4-5 months after the program ended) following the program.⁴ Participants of the experimental group were notified when each of the questionnaires were available and were given approximately one week to answer the questionnaire. Questionnaires were answered online through the Internet.

Weekly questionnaires. The weekly questionnaire was administered to the experimental group for five of the seven weeks (the first and last week were excluded) of the program at the end of the weekly meetings. The weekly questionnaire was designed to measure program activities for the specific week it was administered.

⁴ See Appendix D for a copy of the pretest/posttest/follow-up posttest questionnaire

Control Group

All participants of the control group were recruited through an introductory human development class. This class is conducted in both the Fall and Spring semesters and it was possible to obtain two control group samples at the two respective times to match the experimental groups. There were two incentives provided to participants of the control group to answer the questionnaire. The first incentive for participants in the control group was receiving extra credit for completing the pretest and/or the posttest. All students in the class were allowed to answer the pretest and/or the posttest, meaning therefore that there were some students who answered only one questionnaire (the pretest or posttest) and other students answered both questionnaires. There were greater incentives for answering both questionnaires than for answering one questionnaire. Only those students who answered both questionnaires (pretest and posttest) were then later invited to answer the follow-up posttest. Because participants would no longer be enrolled in the same class the next semester when the follow-up posttest was administered, another second incentive was offered for those participants who completed the follow-up posttest questionnaire. These participants were placed in a lottery where one winner received \$100 for participating in the follow-up posttest questionnaire.

The control group answered the pretest/posttest/follow-up posttest questionnaires at the same time as their respective experimental group and was also given one week to answer the questionnaire. So, for example, the control and experimental groups of the Fall session answered the pretest questionnaire at the same time period, that is, during the first week of the program. To access the questionnaires, participants of the control group had to sign into a secure website and were then allowed answer the questionnaires online. The secure website ensured that only those students enrolled in the course had access to the questionnaire.

Measures

Pretest, Posttest, Follow-up Posttest Questionnaires

For assessing program effectiveness, eight different constructs were evaluated: loneliness, attachment styles, social skills, coping, depression, alcohol use and abuse, self-disclosure, and self-esteem. These constructs were measured at the pretest, posttest, and follow-up posttest. Below is a list of the different scales being used to measure each construct. Cronbach's α were calculated for seven of the scales using the combined sample of the control group and the experimental group at the pretest of both the Fall and Spring sessions. For alcohol use, scores from individual items of these measures were used in computations and therefore it was not necessary to calculate Cronbach's α for these measures.

Loneliness. The revised UCLA loneliness scale (Russell, Peplau, & Cutrona, 1980) was used to measure loneliness. The scale is one of the most widely used loneliness measures and has reputable reliability and validity (Shaver & Brennan, 1991). It contained 20 items including items such as "I lack companionship." Participants rated how often they feel the way described in the items on a 4-point Likert scale ranging from never to often. Cronbach's α suggested good internal consistency ($\alpha = 0.91$) of this scale.

Attachment styles. The Feeney Attachment Style Questionnaire (Feeney, Noller, & Hanrahan, 1994) was used to assess attachment style. This scale was developed in an attempt to resolve some issues surrounding previous attachment scales (Stein, Jacobs, Ferguson, Allen, & Fonagy, 1998) and the developers of the scale provide evidence that it has good validity and reliability (Feeney, Noller, & Hanrahan, 1994). The scale has 40 items and five sub-scales: confidence, discomfort, relationships as secondary, need for approval, and preoccupation. Examples of items for each of the subscales are: confidence – "I feel confident about relating to

others”; discomfort – “I find it hard to trust other people”; relationships as secondary – “to ask for help is to admit that you’re a failure”; need for approval – “it’s important to me that others like me”; and preoccupation – “I worry a lot about my relationships.” Participants rated how much they agree or disagreed with each statement on a 6 point Likert scale from “totally disagree” to “totally agree.” Cronbach’s α for the five subscales ranged from 0.68 (relationships as secondary) to 0.86 (discomfort).

Social skills. The social skills scale used was developed by Furnham and Gunter (1983). For this study, only a subset of items was used from the original scale. This subset of items was not a subscale of the original scale but instead were chosen based on relevance to the intervention. Within this subset of items, there was one subscale to the social skills scale being used in this study. This subscale relates specifically to social skills involved in interacting with strangers. In all there were 23 items used in this scale, with 6 items dedicated to the stranger subscale. Items included statements such as “I feel shy around strangers” and participants stated how much they agreed or disagreed with each statement on a six-point Likert scale from “totally disagree” to “totally agree.” Both the overall scale and subscale showed good internal consistency with Cronbach’s $\alpha = 0.95$.

Coping. The coping scale used was compiled by Seepersad (2001). It consists of 35 items and has four sub-scales: rumination, passive-avoidant, constructive active, and emotion expression and social coping. Examples of items for each of these subscales are: rumination – “I feel sad about myself and my life”; passive-avoidant coping – “I sleep more than usual”; constructive-active coping – “I exercise or go for a walk”; emotion expression and social coping – “I ask people who have had similar experiences what they did.” Participants rated on a 4 point Likert scale from “I usually don’t do this at all” to “I usually do this a lot” how much they

perform each of the actions described in the statements. There were acceptable levels of internal consistency with Cronbach's α ranging from 0.74 (passive-avoidant) to 0.89 (emotion expression and social coping).

Depression. The Beck Depression Inventory (Beck, Ward, & Mendelson, 1961) was the scale used to measure participants' level of depression. This scale is one of the most widely used measures of depression showing both good reliability and validity (Shaver & Brennan, 1991). In this scale, participants are required for each item to select from a group of statements the one that best describes how they feel during the past week. Each item had four statements ranging from descriptions of minimal depression (e.g., "I do not feel sad") to high depression ("I am so sad or unhappy I can't stand it"). In all there were 20 items with Cronbach's $\alpha = 0.84$.

Alcohol use and abuse. These scales were taken from the University of Illinois Counseling Concerns Survey. Participants had to rate how much they did each statement on a 6 point Likert scale from "never" to "daily". The alcohol use scale consisted of two items, "I drink five or more drinks in a 24-hour period", "I drink four or more drinks in a 24-hour period." The scale basically measures how often participants consumed large quantities of alcohol. The second scale, alcohol abuse, has two items, "I have missed a class due to drinking", "After drinking, I have forgotten where I was or what I did." These items assessed the frequency of situations in which alcohol intake was excessive enough to produce serious aftereffects. Cronbach's α for the two alcohol abuse items was 0.75.

Self-disclosure. This scale was a subscale of a larger scale called the Privacy scale developed by Buss (1999). This particular subscale measured the degree of self-disclosure participants made in conversations with others. There were six items in this scale, including items such as "I prefer that people know only a little bit about me." Respondents stated how

much they agreed or disagreed with each item on a six point Likert scale from “totally disagree” to “totally agree.” The Cronbach’s α of 0.69 suggested an acceptable level of internal consistency.

Self-esteem. To assess self-esteem the Rosenberg (1965) self-esteem scale was used. This is a well established scale, showing both good reliability and validity (Shaver & Brennan, 1991). The scale consists of 10 items such as “I take a positive attitude toward myself.” Participants rated how much they agree or disagree with each of the statements on a 6 point Likert scale from “totally disagree” to “totally agree.” This scale had an acceptable level of internal consistency (Cronbach’s $\alpha = 0.77$).

Weekly Questionnaires

A weekly questionnaire was developed for program monitoring, which contained the components: program performance, participants’ level of participation, and week to week emotional states. The questionnaire was developed using guidelines provided by Rossi, Freeman, and Lipsey (1999, p. 82-84) to assess these program monitoring components. For example, Rossi et al. (1999) suggest standard items (such as participants’ level of satisfaction) that should be included in program monitoring.

The weekly questionnaire was divided into sub-components measuring the three components of program monitoring. Table 2.1 provides a description of the components, sub-components along with item summaries used to assess these components.

Table 2.1

Components, Sub-Components And Items (In Abbreviated Form) In The Weekly Questionnaire

Component	Sub-Component	Items (in abbreviated form)
I. Program Performance	A. Relevance of topic	1. Module relevant 2. New insights into reducing loneliness 3. Learned about self
	B. Usefulness of social skills	1. Social skills useful
	C. Satisfaction	1. Satisfied with program 2. Glad came meeting
	D. Group cohesion	1. Comfortable disclosing personal info. 2. Closer to group members 3. Talk about experiences
	E. Effectiveness of facilitator	1. Sean did a good job
II. Participants' Level of Participation		1. Contributed same amount of time 2. Contributed same amount of effort
III. Week to Week Emotional States	A. Reduced feelings of loneliness and sadness	1. Feel less lonely 2. Feel less sad
	B. Feelings of confidence and satisfaction with self	1. Satisfied with self 2. Confident meeting new people

Sample

Experimental Group

Subjects. Fourteen participants were enrolled in the Fall session and 8 participants in the Spring session. There were small levels of attrition in the program leaving the final groups with 9 participants in the Fall session and 7 participants in the Spring session. Participants in the final group were defined as individuals who attended more than three meetings and attended either the last meeting and/or the second to last meeting.

There was some diversity among participants. The Fall session was relatively evenly distributed with regards to gender (4 males and 5 females), however, the Spring session had a disproportionate amount of males (6 males and 1 female). The average ages at both times were similar: 21.7 for the Fall session and 20.6 for the Spring session. The majority of participants were White in both sessions (4 in the Fall group, 5 in the Spring group). In the Fall session there were also 3 Asian Americans, 1 African American, and one Foreign/International student. In the Spring session, there were also 1 Asian American and 1 Other ethnicity. Female participants were the only ones who reported that they were in a romantic relationship at the start of the program, 3 in the Fall session and the 1 female participant in the Spring session. Participants also had spent on average more than 3½ years in college, 3.6 years in college for the Fall session and 4.1 for the Spring session. The majority of participants from both sessions came from nuclear families, 8 participants in the Fall session and 4 in the Spring session. Participants also reported coming from extended families (1 from Fall), step families (1 from Spring), adopted families (1 from Spring), and living with a sibling (1 from Spring). Finally, most participants reported living with a roommate (3 for Fall and 5 for Spring) or alone (5 for Fall and 2 for Spring). One participant reported living with her romantic partner.

There was a small attrition in terms of the number of participants answering the follow-up posttest questionnaire. Two participants in Fall session and 1 participant in the Spring session did not answer the follow-up posttest questionnaire, reducing the follow-up posttest sample size to 13.

Control Group

The control group consisted of one total group (known as the total control group) and two sub-groups. The total control group was made up of all control group participants who completed the pretest and posttest questionnaires. The two sub-groups were the matched control group and the follow-up control group. The matched control group consisted of participants in the total control group who were selected based on certain criteria described below. The follow-up control group consisted of those participants in the total control group who answered the follow-up posttest questionnaire.

Total Control Group

Subjects. Within the total control group, there were 172 participants in the Fall and 186 participants in the Spring. These were participants who answered the questionnaire at both time points, corresponding to the time that the pretest and posttest measures were administered to the experimental group. For the Fall session there were 39 males and 133 females and in the Spring session there were 47 males and 139 females. The average age of participants in the control group was 19.7 and 19.8 for the Fall group and Spring group respectively.

Matched Control Group

Selection process. Participants in the matched control group needed to be participants of the total control group that matched the participants of the experimental group as much as possible. To do this, the selection of the matched control group was done in three stages. The

first stage involved selecting a pool of participants from the total control group that had approximately the same level of loneliness with participants in the experimental group. In stage two, the pool of participants was further stratified based on the session (Fall or Spring) when they answered the questionnaire, their gender, and whether they had a romantic partner or not. In the final, third stage, further cases were eliminated (when possible) if they did not match the level of depression of the participants in the experimental group. Therefore for each person in the experimental group attempts to pick similar persons from the total control group based on: first, their level of loneliness; second, whether they participated in the Fall or Spring, their gender, and whether or not they had a romantic partner; and third, their level of depression. The selection process, however, only worked moderately well; there were not enough males in the total control group to match the males in the experimental group in the Spring session. Also, the range of loneliness in the experimental group was higher than that of the total control group. To ensure that the overall mean level of loneliness was approximately the same in both groups, somewhat more participants were assigned to the matched control group than the experimental group.

Subjects. The final matched control group consisted of 18 participants with a loneliness mean of 1.90. T-tests between the experimental group and the matched control group suggested that this difference was not significant ($t=.528, p=.601$).

Table 2.2

Comparison Of Matched Control Sample And Experimental Group

	Fall		Spring	
	Matched Control	Experimental	Matched Control	Experimental
Demographic				
# of Participants	9.0	9.0	9.0	7.0
Gender				
Male	4.0	4.0	3.0	6.0
Female	5.0	5.0	6.0	1.0
Age	19.7	21.7	20.3	20.6
# in Romantic Relationship				
Male	2.0		2.0	
Female	2.0	3.0	4.0	1.0
Mean Years in College	2.4	3.6	2.4	4.1
# from Nuclear Family	7.0	8.0	7.0	4.0
Lives with				
Alone	2.0	5.0	2.0	2.0
Roommate	7.0	3.0	7.0	
Romantic Partner		1.0		
Mean Loneliness	1.9	1.8	1.8	2.1

Table 2.2 shows the overlap between the matched control group and the experimental group. While there are some differences between the matched control group and the experimental group, there is considerable overlap between both groups in terms gender, age,

number of years in college, number of participants from nuclear families, and the mean loneliness. The groups in the Fall session were more closely matched than the groups in the Spring session. One reason for this could be because the disproportionate number of males in the Spring experimental group.

Follow-Up Control Group

The follow-up control group consisted of individuals who answered all three questionnaires, the pretest, posttest, and follow-up posttest. For the Total Control Group, 69 participants (56 female) of the Fall session, and 78 participants (59 female) of the Spring session answered the follow-up posttest questionnaire. The attrition rate was approximately 59%. For the Matched Control Group, 10 participants who answered the posttest questionnaire failed to answer the follow-up posttest questionnaire, 7 were from the Fall session and 3 were from the Spring session. This left a significantly smaller Matched Control Group answering the follow-up posttest questionnaire (8 participants of the original 18).

CHAPTER 3: PROGRAM EFFECTIVENESS RESULTS

Introduction

This first chapter of results presents the findings for Program effectiveness. Program effectiveness assessed the impact of the program on participants in the experimental group. To measure program effectiveness a pretest, posttest, and follow-up posttest design was used with participants from both the experimental group and various sub-samples of the control group. The pretest, posttest, and follow-up posttest all used the same questionnaire, which evaluated eight constructs: loneliness, attachment style, social skills, coping, depression, alcohol use and abuse, self-disclosure, and self-esteem. The questionnaire was administered during the first week of the program (pretest), the week after the program finished (posttest), and at the end of the following semester of the program (follow-up posttest) for both the experimental and control groups.

The samples of the participants from pretest to posttest and pretest to follow-up posttest are different due to attrition. Therefore the pretest to posttest samples need to be distinguished from the pretest to follow-up posttest samples for both the control and the experimental groups. All 16 participants in the experimental group completed the pretest and posttest questionnaires, however, 3 participants did not complete the follow-up posttest questionnaire. Due to this attrition there were two different experimental groups, the Posttest Experimental Group (all 16 participants) and the Follow-Up Experimental Group (13 participants). The control group varied on two dimensions: the matched dimension and the time dimension. The matched dimension had two levels: the Total level, in which there is no matching and consisted of all control group participants that answered the questionnaire, and the Matched level, which consists of participants chosen from the total control group that matched the experimental group on specific

characteristics (including loneliness). The time dimension also had two levels: the Posttest level consisting of those participants who answered both the pretest and posttest questionnaires, and the Follow-Up level consisting of participants who answered the questionnaire at all three time points. When the two dimensions are combined, there are four variations on the control group: the Posttest Total Control Group, the Posttest Matched Control Group, the Follow-Up Total Control Group, and the Follow-Up Matched Control Group.

The analysis of program effectiveness was done in two parts, with each part comparing the experimental group with two different groups of control samples. Part One of the analysis involved examining changes from the pretest to the posttest for the Posttest Experimental Group and Posttest Control Groups (Total and Matched). Part Two of the analysis focused on determining whether changes from pretest to posttest were sustained at the follow-up posttest for the Follow-Up Experimental Group and the Follow-Up Control Groups (Total and Matched). While it would have been more concise to use the follow-up posttest samples to examine changes from the pretest to posttest and then whether these changes were sustained at the follow-up posttest, the considerable attrition from posttest to follow-up posttest made it necessary to split the program effectiveness analysis into these two parts. Part One of the analysis had more comprehensive samples and was better able to examine the effect of the program on the experimental group and compare it to a better Matched Control Group and a larger Total Control Group. However, while Part Two had smaller samples, it provided some clues as to the long-term effects of the program and how those compare with the control groups.

In addition, analyses using the Total vs. the Matched Control Group also provide different kinds of useful information. The Total Control Group provides a contrast between the experimental group and the ‘general’ student population. The Matched Control Group, however,

provides a more precise contrast between the experimental group and students similar to participants in the experimental group.

Analysis Plan

Analysis of program effectiveness needed to determine two things: 1. Whether changes from pretest to posttest were significantly greater for experimental group than the control group, and 2. Whether the significantly greater changes found for the experimental group from pretest to posttest were sustained at the follow-up posttest. To determine if these changes were significant, the statistical procedure, repeated measures MANOVA, was calculated using the computer software, Statistical Program for Social Science (SPSS). A repeated measures MANOVA is similar to MANOVA except that it takes into account that at least one factor contains a measure that is administered to the same individual repeatedly over time. The repeated measures MANOVA calculated significant interaction effects, which provides information about how the experimental group varied relative to the control group.

There were three factors used in the repeated measure MANOVA calculations. There was one dependent factor, TIME, which was the within-subjects factor. As the within-subjects factor, TIME consisted two variables measuring the scale of interest (e.g. loneliness, depression, self-esteem) at two different time points. For example, for the analysis of pretest to posttest changes for loneliness, there would be two variables: a pretest loneliness variable and a posttest loneliness variable. The within-subjects factor, TIME, would contain these two variables (pretest & posttest loneliness). There were also two independent, between-subjects factors: GROUP and SESSION. GROUP is the factor discriminating between an individual belonging to the experimental or the control group. Whether participants participated in the Fall or Spring session was the SESSION factor.

Using these factors, the repeated measures MANOVA can provide a variety of results, however, the results of interest included the interaction of TIME x GROUP and TIME x GROUP x SESSION. The first interaction determined whether both groups (experimental and control) had parallel trends across time. If the interaction was significant, this implied that the trends were dissimilar, and analysis of the means across the time points for each group can determine in what way the trends were dissimilar. So, for example, if the analysis of loneliness revealed a significant TIME x GROUP interaction with the experimental group showing a drop in loneliness and the control group showing a rise in loneliness over time, then one can conclude that the drop in loneliness for the experimental group was significantly different from the rise in loneliness of the control group.

The second interaction, TIME x GROUP x SESSION, determined whether the interaction of TIME x GROUP for the Fall session was similar to the interaction of TIME x GROUP for the Spring session. This was useful know for two reasons: 1. It can highlight a significant interaction for one session but not the other session with the implication that the program had an effect at one session but not that other session. 2. In the case where the overall TIME x GROUP interaction was significant but TIME x GROUP x SESSION was not significant, the implication was that the trends found for TIME x GROUP was similar for both the Fall and Spring sessions. Therefore, for example, if the TIME x GROUP interaction suggested a significant decrease in loneliness for the experimental group but not the control group, and the TIME x GROUP x SESSION was not significant, then the implication is that this finding is true for both sessions (Fall and Spring). If neither the TIME x GROUP interaction or the TIME x GROUP x SESSION interaction were significant then this suggested that the program did not have a significant impact on the experimental group for that scale.

Because of the small sample size, the level of significance for these repeated measures MANOVA was increased from the customary $\alpha = 0.05$ to $\alpha = 0.10$. Rossi, Freeman, and Lipsey (1999) suggested this technique in cases with small sample sizes in order to reduce Type II error.

Changes From Pretest To Posttest

The first part of the analysis of program effectiveness tested several hypotheses using data collected from the pretest and posttest measures for both the experimental and the two posttest control groups (total and matched). These hypotheses were:

1. There will be significantly greater decreases in the loneliness in the experimental group than the control group.
2. There will be improvements in target problem areas:
 - a. Participants in the experimental group vs. the control group, will report using more of the confidence attachment style and less use of discomfort, relationships as secondary, need for approval, and preoccupation attachment styles.
 - b. There will be significantly greater increases in social skills in the experimental group than the control group.
 - c. Participants in the experimental group vs. the control group, will report using more of constructive-active and emotion expression and social coping and less use of rumination and passive-avoidant coping.
3. There will be changes in correlates of loneliness:
 - a. There will be significantly greater decreases in depression, alcohol use and abuse in the experimental group than the control group.
 - b. There will be significantly greater increases in self-disclosure and self-esteem in the experimental group than the control group.

Hypotheses were tested using the repeated measures MANOVA described in the analysis plan for the eight scales (including the subscales). The results of this analysis provide information about whether participants showed significantly greater improvements than the control group on these scales. For each hypothesis, results for the tests using the Posttest Total Control Group and the Posttest Matched Control Group are presented together.

Hypothesis 1: Decreases In Loneliness In The Experimental Group

Given that the main purpose of the program was to reduce the loneliness of participants in the experimental group, it is expected that they made significantly greater reductions in loneliness than the control groups. If the hypothesis was supported then this suggested that the program worked and was successful in reducing loneliness in participants of the program.

The table below shows the TIME x GROUP and TIME x GROUP x SESSION interaction results of the repeated measures MANOVA for loneliness for the Posttest Total Control Group and the Posttest Matched Control Group with the Posttest Experimental Group.

Table 3.1

Repeated Measures MANOVA For Loneliness

Variable	Control Group	Source	Within df	Between df	F	p
Loneliness	Total	TIME x GROUP	1	369	22.63	<0.01
		TIME x GROUP x SESSION	1	369	1.21	0.27
	Matched	TIME x GROUP	1	30	3.12	0.08
		TIME x GROUP x SESSION	1	30	0.00	0.99

Table 3.1 shows significant interaction effects for TIME x GROUP for both the Posttest Total Control Group and the Posttest Matched Control Group. Analysis of the means showed

that the experimental group showed a reduction in loneliness from pretest (1.96) to posttest (1.62). The Posttest Total Control Group showed a negligible increase in loneliness (from 0.84 to 0.87). The Posttest Matched Control Group however, also showed a decrease in loneliness (from 1.90 to 1.70) but that decrease (0.20) was not as great as the experimental group (0.34). The failure to find a significant 3-way interaction, TIME x GROUP x SESSION for loneliness also suggested that this pattern was the same for both the Fall and Spring groups.

These results provided evidence in support of the hypothesis that the experimental group showed significantly greater decreases in loneliness than the control group. Support for the hypothesis also indicates that the program fulfilled its primary objective of reducing the level of loneliness in participants in the experimental group from pretest to posttest.

Hypothesis 2: Improvements In Target Problem Areas

Because the program sought to reduce loneliness by focusing on three problem areas (attachment styles, social skills, and coping), these hypotheses tested whether participants of the program also showed improvements in these areas. Below are the individual hypotheses and the results.

Hypothesis 2a: Improvements In Attachment Style

This hypothesis suggested that participants of the program showed improvements in their attachment style. The attachment scale assessed participants' beliefs and expectations about relationships in general. There are five subscales of attachment: confidence, discomfort, relationships as secondary, need for approval, and preoccupation. Specifically the hypothesis proposed that there was an increase in the subscale, confidence and that there were decreases in the other four subscales.

Increases in confidence. Table 3.2 shows the TIME x GROUP and TIME x GROUP x SESSION interaction results of the repeated measures MANOVA for the confidence subscale for the Posttest Experimental Group with the Posttest Total Control Group and the Posttest Matched Control Group.

Table 3.2

Repeated Measures Design For Confidence Subscale Of Attachment

Subscale	Control Group	Source	Within df	Between df	F	p
Confidence	Total	TIME x GROUP	1	370	16.96	<0.01
		TIME x GROUP x SESSION	1	370	0.01	0.91
	Matched	TIME x GROUP	1	30	10.39	<0.01
		TIME x GROUP x SESSION	1	30	0.75	0.40

Table 3.2 shows highly significant results for the TIME x GROUP interaction for confidence for both control groups. In addition, the analysis of means supported the hypothesis that the Posttest Experimental Group showed a significantly greater increase in confidence than the control groups. For example, with the Posttest Matched Control Group, the experimental group started off at a level below this control group (2.11 for experimental, 2.26 for Posttest Matched Control Group) and rose to a level above the Posttest Matched Control Group (2.58 for experimental, 2.18 for Posttest Matched Control Group). This suggested that the program had a significant impact on increasing participants' confidence attachment styles.

Decreases in discomfort, relationships as secondary, need for approval, and preoccupation. Table 3.3 shows the TIME x GROUP and TIME x GROUP x SESSION interaction results of the repeated measures MANOVA for the four other subscales of attachment

for the Posttest Experimental Group with the Posttest Total Control Group and the Posttest Matched Control Group.

Table 3.3

Repeated Measures Design For 4 Subscales Of Attachment

Subscale	Control Group	Source	Within df	Between df	F	p
Discomfort	Total	TIME x GROUP	1	370	2.51	0.11
		TIME x GROUP x SESSION	1	370	1.34	0.25
	Matched	TIME x GROUP	1	30	3.13	0.09
		TIME x GROUP x SESSION	1	30	0.36	0.55
Relationships as Secondary	Total	TIME x GROUP	1	370	11.85	<0.01
		TIME x GROUP x SESSION	1	370	1.69	0.19
	Matched	TIME x GROUP	1	30	6.22	0.02
		TIME x GROUP x SESSION	1	30	0.90	0.35
Need for Approval	Total	TIME x GROUP	1	370	3.97	0.05
		TIME x GROUP x SESSION	1	370	2.02	0.16
	Matched	TIME x GROUP	1	30	1.43	0.24
		TIME x GROUP x SESSION	1	30	1.40	0.25
Preoccupation	Total	TIME x GROUP	1	370	4.76	0.03
		TIME x GROUP x SESSION	1	370	0.22	0.64
	Matched	TIME x GROUP	1	30	3.34	0.08
		TIME x GROUP x SESSION	1	30	0.04	0.85

Table 3.3 shows that the subscales, relationships as secondary, and preoccupation showed the strongest results with the TIME x GROUP interactions being significant for both control groups. Analyses of the means for both subscales showed the expected greater decreases for the Posttest Experimental Group than either of the control groups. The decreases are particularly marked for the subscale preoccupation, where the experimental group had a higher level at the pretest (3.11) than the Posttest Matched Control Group (3.01), but dropped to a level below that of the control group (2.80 for the experimental group and 3.01 for the control group). The non-significance of the TIME x GROUP x SESSION interaction also suggests that these findings were consistent for both the Fall and Spring sessions for these two subscales.

The other two subscales showed some mixed results. The subscale, discomfort, had a significant TIME x GROUP interaction for the Posttest Matched Control Group and close to significant TIME x GROUP interaction for the Posttest Total Control Group. Analysis of the means also showed the expected greater decreases for the experimental group vs. the two control groups. Finally, the subscale, need for approval, showed the weakest results with only the TIME x GROUP interaction for the Posttest Total Control Group being significant. This may be due to a lack of power to detect significant results rather than the program being ineffective in producing the desired results. Analyses of the means revealed the expected trend with the experimental group showing decreases in levels of need for approval more than the control groups (e.g. 2.75 to 2.47 for the experimental group and 2.74 to 2.71 for the Posttest Matched Control Group).

Summary. In support of hypothesis 2a, these results suggested that the program had a significant impact on improving the attachment styles of participants. In particular, the strongest results showed that the program helped participants feel more confident about meeting and

relating to other people (confidence), feel more open to asking for help (relationships as secondary) and less preoccupied about getting into close relationships (preoccupation). Though the findings were weaker, analysis of the means also suggested that participants also reported feeling less discomfort in relationships (discomfort), and needing the approval of others (need for approval). The weaker findings could be due to a lack of power rather than the program not having an impact.

Hypothesis 2b: Increases in Social Skills

This hypothesis proposed that participants of the experimental group increased their levels of social skills from pretest to posttest more than the control groups. Table 3.4 shows the TIME x GROUP and TIME x GROUP x SESSION interaction results of the repeated measures MANOVA for the entire social skills scale and a subscale (a subset of the entire scale), social skills with strangers, for the Posttest Experimental Group with the Posttest Total Control Group and the Posttest Matched Control Group.

Table 3.4

Repeated Measures Design for Social Skills

Variable	Control Group	Source	Within df	Between df	F	p
Social Skills (overall)	Total	TIME x GROUP	1	370	8.76	<0.01
		TIME x GROUP x SESSION	1	370	0.12	0.72
	Matched	TIME x GROUP	1	30	4.69	0.04
		TIME x GROUP x SESSION	1	30	0.38	0.54

Table 3.4 cont

Social Skills (stranger)	Total	TIME x GROUP	1	370	10.35	<0.01
		TIME x GROUP x SESSION	1	370	0.40	0.53
	Matched	TIME x GROUP	1	30	5.76	0.02
		TIME x GROUP x SESSION	1	30	0.88	0.36

Table 3.4 shows consistently that there was a significant TIME x GROUP interaction for both the overall social skills scale and the subscale, social skills with strangers, and for both control groups. The non-significance of the TIME x GROUP x SESSION also implied that these findings occurred at both the Fall and Spring sessions. Analyses of the means revealed that the Posttest Experimental Group showed an increase in social skills (from 2.17 to 2.51), while, for example, the Posttest Matched Control Group showed a decrease in social skills (from 2.21 to 2.14). These results are similar for social skills subscale.

The analysis of the means of the experimental group and the Posttest Total Control Group also show similar findings (experimental group showed increases social skills, control group showed slight decreases in social skills) except in this case the average level of social skills for the Posttest Total Control Group is higher than that of the experimental group at both times.

These results provide compelling evidence in support of the hypothesis 2b. In particular the results provided evidence that the program helped participants of the program increase their levels of social skills from pretest to posttest.

Hypothesis 2c: Improvements In Coping

The expectation of this hypothesis is that there were improvements in coping for participants of the program from pretest to posttest compared to the control groups. The coping scale assessed the coping behaviors of participants when they experience feelings of loneliness.

There are four subscales of coping: constructive active, emotion expression and social, rumination, and passive-avoidant coping. Two of the subscales of coping (constructive active and emotion expression and social) are positive coping strategies because they help to effectively reduce feelings of loneliness, whilst the other two (rumination and passive-avoidant) are negative coping strategies because they are ineffective in reducing feelings of loneliness. It was expected that the positive coping strategies increased whilst the negative coping strategies decreased from pretest to posttest.

Increases in positive coping. Table 3.5 shows the TIME x GROUP and TIME x GROUP x SESSION interaction results of the repeated measures MANOVA for constructive active and emotion expression and social subscales of coping for the Posttest Experimental Group with the Posttest Total Control Group and the Posttest Matched Control Group.

Table 3.5

Repeated Measures Design For Positive Coping Subscales

Subscale	Control Group	Source	Within df	Between df	F	p
Constructive-Active	Total	TIME x GROUP	1	369	0.18	0.67
		TIME x GROUP x SESSION	1	369	0.18	0.67
	Matched	TIME x GROUP	1	30	0.01	0.97
		TIME x GROUP x SESSION	1	30	0.01	1.00
Emotion Expression and Social	Total	TIME x GROUP	1	370	0.03	0.86
		TIME x GROUP x SESSION	1	370	0.33	0.57
	Matched	TIME x GROUP	1	30	0.37	0.55
		TIME x GROUP x SESSION	1	30	2.17	0.15

Table 3.5 shows that there were no significant interactions of the experimental group with either of the control groups. Analysis of the means did not show the desired trends with increases for the experimental group. For example, the Posttest Matched Control Group showed similar or greater improvements on these coping behaviors than the experimental group. Overall, therefore, the program did not seem to make an impact in improve the positive coping behaviors of participants.

Decreases In Negative coping. Table 3.6 shows the TIME x GROUP and TIME x GROUP x SESSION interaction results of the repeated measures MANOVA for rumination and passive-avoidant subscales of coping for the Posttest Experimental Group and the Posttest Total Control Group and the Posttest Matched Control Group.

Table 3.6

Repeated Measures Design For Negative Coping Subscales

Subscale	Control Group	Source	Within df	Between df	F	p
Rumination	Total	TIME x GROUP	1	369	5.48	0.02
		TIME x GROUP x SESSION	1	369	0.04	0.84
	Matched	TIME x GROUP	1	30	3.11	0.09
		TIME x GROUP x SESSION	1	30	0.96	0.34
Passive-Avoidant	Total	TIME x GROUP	1	370	<0.01	0.93
		TIME x GROUP x SESSION	1	370	2.33	0.13
	Matched	TIME x GROUP	1	30	0.22	0.65
		TIME x GROUP x SESSION	1	30	3.42	0.07

Table 3.6 shows some mixed findings for negative coping behaviors. There were significant TIME x GROUP interactions for rumination for both control groups and non-significance of the TIME x GROUP x SESSION interaction. Analysis of the means also revealed, for example, that the Posttest Experimental Group had a significant reduction in ruminative coping (from 1.28 to 1.03) compared to the Posttest Matched Control Group whose level of ruminative coping staying relatively constant (1.43 to 1.47).

For passive-avoidant coping, the TIME x GROUP x SESSION was significant for the experimental group with the Posttest Matched Control Group and close to significance for the Posttest Total Control Group. An analysis of the means for the Fall session revealed that the experimental group experienced a significant decrease in use of passive-avoidant coping (from 1.48 to 1.29) and the Posttest Matched Control Group experiencing an increase in passive-avoidant coping (from 1.05 to 1.19). The pattern was not similar for the Spring session with the experimental group showing an increase in passive-avoidant coping (from 1.14 to 1.33). This may be a case of the program having differential effects. The Fall experimental group had a higher use of passive-avoidant coping strategies than the Spring experimental group (1.48 compared to 1.14) and thus the program was effective in reducing the level of passive-avoidant coping. Also the posttest levels of the Fall and Spring experimental groups were relatively similar (1.29 for Fall and 1.33 for Spring).

Summary. These results provide some mixed findings. The strongest finding was that the program was successful in helping participants reduce their levels of ruminative coping. Findings also suggested that the program may have helped reduce passive-avoidant coping for participants high on that coping behavior. None of the more positive coping behaviors (constructive-active or emotion expression and social coping) showed any significant interaction

effects, and suggested that the program did not have a significant impact in fostering these behaviors.

Conclusion

This section examined the targeted problem areas of the program, namely attachment style, social skills, and coping. The main hypothesis of this section was that participants of the experimental group showed significant improvements in these areas from pretest to posttest compared to the control group. In each of the problem areas, the results provided some evidence of improvements in the experimental group. For attachment style, the results showed participants of the experimental group had increase in confidence attachment style and decreases in the negative attachment styles relationships as secondary and preoccupation. The results also showed that participants of the program significantly increased in their levels of social skills from pretest to posttest compared to the control group. The coping results provided some mixed results, only showing significant decreases in negative coping (especially rumination). There were no significant increases in positive coping for the participants of the experimental group when compared with the control groups. Especially with regards to attachment style and social skills, the results provide evidence that the program had a significant impact on improving these targeted areas.

Hypothesis 3: Changes In Correlates Of Loneliness

This last group of hypotheses tested whether the correlates of loneliness (depression, alcohol use and abuse, self-disclosure, and self-esteem) also showed significant changes in participants of the experimental group. If the hypotheses are supported, then this provides some evidence that by addressing loneliness, the program can also have a positive impact on other areas of a person's life. Below are the individual hypotheses and the results.

Hypothesis 3a: Decreases In Depression, Alcohol Use And Abuse

This first hypothesis tested whether two correlates of loneliness (depression and alcohol use and abuse) showed any changes from pretest to posttest. It is expected that these two correlates showed significant decreases when compared to the control group. The analyses for each correlate are below.

Depression. Table 3.7 shows the TIME x GROUP and TIME x GROUP x SESSION interaction results of the repeated measures MANOVA for depression for the Posttest Experimental Group with the Posttest Total Control Group and the Posttest Matched Control Group.

Table 3.7

Repeated Measures Design for Depression

Variable	Control Group	Source	Within df	Between df	F	p
Depression	Total	TIME x GROUP	1	370	3.40	0.07
		TIME x GROUP x SESSION	1	370	0.72	0.40
	Matched	TIME x GROUP	1	30	0.82	0.37
		TIME x GROUP x SESSION	1	30	4.38	0.05

Table 3.7 shows some mixed results. For the Posttest Total Control Group, the TIME x GROUP interaction was significant, whilst for the Posttest Matched Control Group, the TIME x GROUP x SESSION interaction was significant. An analysis of the means for the Posttest Experimental Group showed a significant drop in loneliness (from 0.53 to 0.36) and there was little variation across time in levels of depression for the Posttest Total Control Group (from 0.39 to 0.34). The small difference in depression scores between the experimental group and Posttest

Total Control Group at the posttest suggest that while the experimental group were more depressed at the pretest, their level of depression was reduced to a level comparable with the average college student (represented by the Posttest Total Control Group).

The TIME x GROUP x SESSION interaction for the Posttest Experimental Group and the Posttest Matched Control Group was significant. The analysis of the means of the experimental group with the Posttest Matched Control Group suggested that patterns for the Fall and Spring sessions were different. An analysis of the means for the Fall session reveals that the depression for the experimental group decreased (from 0.66 to 0.45) whereas the level of depression increased for the Posttest Matched Control Group (0.67 to 0.81) with both groups having a similar level of depression at the pretest. However, there was not a similar pattern for the Spring session, with both the experimental and Posttest Matched Control Group decreasing in levels of depression (from 0.37 to 0.24 for the experimental group and 1.09 to 0.82 for the Posttest Matched Control Group). The low reported levels of depression for the Spring experimental group may account for the difference in results between the two sessions since there was less improvement to be made by the Spring group. Overall though, the results provide some evidence that the program did have an effect on reducing depression, especially when the level of depression is high.

Alcohol Use And Abuse. Table 3.8 shows the TIME x GROUP and TIME x GROUP x SESSION interaction results of the repeated measures MANOVA for alcohol use and alcohol abuse for the Posttest Experimental Group with the Posttest Total Control Group and the Posttest Matched Control Group. The variable, alcohol use, measures the frequency with which students had 5 or more drinks within a 24-hour period. Alcohol abuse is a composite score (mean scores across items were tabulated), which measures how often students experience two possible

negative effects of abusing alcohol. In this case, the negative effects were missing a class due to drinking, or forgetting where one was or what one did.

Table 3.8

Repeated Measures Design for Alcohol Use and Alcohol Abuse

Variable	Control Group	Source	Within df	Between df	F	p
Alcohol Use	Total	TIME x GROUP	1	365	1.40	0.24
		TIME x GROUP x SESSION	1	365	2.06	0.15
	Matched	TIME x GROUP	1	30	0.49	0.49
		TIME x GROUP x SESSION	1	30	0.09	0.77
Alcohol Abuse	Total	TIME x GROUP	1	365	15.87	<0.01
		TIME x GROUP x SESSION	1	365	13.18	<0.01
	Matched	TIME x GROUP	1	30	11.77	<0.01
		TIME x GROUP x SESSION	1	30	9.20	<0.01

The results in Table 3.8 show that there were no significant findings for alcohol use for either the Posttest Total Control Group or the Posttest Matched Control Group with the Posttest Experimental Group. Analysis of the means show the experimental group having a consistently lower score of alcohol use than either control groups at both points in time (pretest and posttest).

However, the findings for alcohol abuse were different, namely that both interactions were significant for both control groups with the Posttest Experimental Group. Analyses of the means showed a consistent finding across groups: both the Posttest Total Control Group and the Posttest Matched Control Group show little variation from pretest to posttest for alcohol abuse, while the experimental group showed a decrease in alcohol abuse from pretest to posttest. In

particular the Spring experimental group showed a dramatic decrease in alcohol abuse scores (1.07 to 0.00) while the Fall experimental group does not show any variation in scores from pretest to posttest (0.17 at both times). A check of the dataset also revealed that the Spring experimental group's initially high score was not due to outliers, six of the seven participants had a score of 1 and the other participant had a score of 1.5.

These scores suggested that the program had no impact on the Fall experimental group but had a significant impact on the Spring experimental group. One point worth noting is that the scores of the Fall experimental group were low at both points in time (0.17) suggesting that the prevalence of alcohol abuse was initially low and may explain why the program had little impact for this session. The Spring experimental group however, had an initially high score which was then reduced, and suggested that the program may be effective in reducing levels of alcohol abuse in persons for whom it is a problem.

Summary. The hypothesis for this section tested whether participants of the program showed significant decreases in depression and alcohol use and abuse when compared with the control groups. In both cases, the program only appeared to have an impact when the level was high. For depression, the Fall experimental group had high levels of depression and showed a significant decrease compared to the Posttest Matched Control Group. For alcohol abuse, the Spring experimental group had high levels and showed a significant decrease compared to both control groups. The sessions showing high levels of depression or alcohol abuse were also interesting because of its possible relationship to the gender. The Fall experimental group had five females and four males, while the Spring experimental group had one female and six males. Although both groups had high levels of loneliness, the display of different symptoms could be

gender based, that is, females were more likely to report depression and males were more likely to report alcohol abuse.

Hypothesis 3b: Increases In Self-Disclosure and Self Esteem

This second hypothesis proposed that the participants of the experimental group showed significant increases in self-disclosure and self-esteem from pretest to posttest when compared to the control groups. The analyses for these two correlates are below.

Self-Disclosure. Table 3.9 shows the repeated measures MANOVA results for self-disclosure for the Posttest Experimental Group with the Posttest Total Control Group and the Posttest Matched Control Group.

Table 3.9

Repeated Measures Design for Self-Disclosure

Variable	Control Group	Source	Within df	Between df	F	p
Self-Disclosure	Total	TIME x GROUP	1	370	0.01	0.94
		TIME x GROUP x SESSION	1	370	1.54	0.22
	Matched	TIME x GROUP	1	30	0.01	0.99
		TIME x GROUP x SESSION	1	30	0.44	0.51

Table 3.9 shows that for self-disclosure there were no significant results when the experimental group is compared to either the Posttest Total Control Group or the Posttest Matched Control Group. Analysis of the measures also did not show that the experimental group made greater gains than the control group. The results implied that the program did not help participants increase their levels of self-disclosure.

Increases In Self-Esteem. Table 3.10 shows the TIME x GROUP and TIME x GROUP x SESSION interaction results of the repeated measures MANOVA for self-esteem for the Posttest Experimental Group and the Posttest Total Control Group and the Posttest Matched Control Group.

Table 3.10

Repeated Measures Design for Self-Esteem

Variable	Control Group	Source	Within df	Between df	F	p
Self-Esteem	Total	TIME x GROUP	1	368	4.69	0.03
		TIME x GROUP x SESSION	1	368	2.12	0.15
	Matched	TIME x GROUP	1	30	0.95	0.34
		TIME x GROUP x SESSION	1	30	3.28	0.08

Table 3.10 shows some discrepant findings between the analysis of the Posttest Experimental Group with the Posttest Total Control Group and the Posttest Matched Control Group. Namely, the only TIME x GROUP interaction was significant for the total control group and only the TIME x GROUP x SESSION interaction was significant for the matched control group. The lack of significance of the TIME x GROUP interaction of the experimental group with the Posttest Matched Control Group could be due to a lack of power to detect significant differences. An analysis of the means revealed the desired ‘interaction pattern’: the experimental group showed an increase from 1.77 to 1.93 and both control samples had little variation from pretest to posttest for self-esteem (from 2.19 to 2.15 for the Posttest Total Control Group and 1.56 to 1.55 for the Posttest Matched Control Group).

The significant TIME x GROUP x SESSION interaction also revealed an interesting result. An analysis of the means suggested that the program made a significant impact on increasing the self-esteem of the Fall experimental session but not the Spring experimental session. So, for example, in the Fall session the experimental group showed an increase in self-esteem (1.67 to 1.92) whereas the Posttest Matched Control Group showed a decrease in self-esteem (1.61 to 1.44). Both groups in the Fall session also started off with approximately the same level of self-esteem. In the Spring session, the experimental group (self-esteem increased from 1.90 to 1.93) rated their self-esteem consistently higher than the Posttest Matched Control Group (self esteem increased from 1.50 to 1.66).

These findings support the idea of that the program showed differential effects depending upon need, the higher the level of self-esteem, the less of an impact the program had on participants. Also, the level of self-esteem of the Spring experimental group at the pretest (1.90) was similar to posttest level of the Fall experimental group (1.92), and thus showed less of an increase.

Summary. This section sought to test the hypothesis that the experimental group showed significantly greater increases in self-disclosure and self-esteem than the control groups. The analyses presented some mixed findings. There was no evidence to suggest that these changes occurred for self-disclosure. The analysis of self-esteem suggested that, if self-esteem is low, then the program was successful in raising the level of self-esteem but had little effect if self-esteem was already high.

Conclusion

This last section hypothesized that certain correlates of loneliness showed significant changes from pretest to posttest for the experimental group. Three of the four correlates showed

significant changes, namely decreases in depression and alcohol abuse (but not alcohol use), and increases self-esteem. In all three cases the effect seemed to be stronger for one of the two sessions (Fall or Spring). The session that had the stronger effect was dependent upon the pretest level. In the cases of depression for the Fall session and alcohol abuse for the Spring session, the pretest level was particularly high and thus showed significant decreases at the posttest. In the case of self-esteem for the Fall session, the self-esteem level was low and showed a significant increase. Overall though, these results do provide some evidence that a program aimed at reducing loneliness can also have a positive impact in other areas as well.

Part One Conclusion

This section investigated whether participants of the Posttest Experimental Group made significantly greater improvements than the two control groups from the pretest to the posttest. In particular it tested three main hypotheses, which looked at decreases in loneliness, improvements in target problem areas (attachment style, social skills, and coping) and changes in correlates of loneliness (depression, alcohol use and abuse, self-disclosure, and self-esteem). The results provided evidence that the program significantly reduced the levels of loneliness in participants of the experimental group. Also the results showed improvements in some target problem areas, particularly attachment style and social skills. Finally, there was also evidence that other correlates of loneliness showed changes, namely depression, alcohol abuse, and self-esteem. However, especially with regards to the correlates of loneliness, these changes seemed specific to one of the two sessions. The results showed that the program was not only successful in reducing loneliness and improving target problem areas, but also suggested that in doing so, it also impacted other areas of participants' lives as well.

There were some attempts to perform follow-up mediation and moderation analyses given the results found in this section. The mediation analysis involved testing whether the target problem areas mediated the reductions found in loneliness from pretest to posttest in the experimental group. However the sample size was too small to permit formal tests of mediation to determine whether these target problem areas mediated the decreases in loneliness. Moderation analyses investigated whether the significant changes found from pretest to posttest were moderated by gender or age. So, for example, did females show significantly greater decreases in loneliness than males? Using between subjects t-tests, no significant moderation effects were found for either gender or age.

Changes From Pretest To Follow-Up Posttest

The second part of the analysis of program effectiveness was to test whether changes found from the pretest to posttest were sustained at the follow-up posttest. The data for the follow-up posttest were collected at the end of the semester following the posttest (about 4 to 5 months). Attrition was one of the main problems with using the follow-up posttest data. There were decreased numbers of respondents in both the experimental group and the control groups at the follow-up posttest. Three participants in the experimental group did not answer the follow-up posttest questionnaire. Two different control groups were constructed based on the follow-up posttest sample. These two control groups were the Follow-Up Total Control Group and the Follow-Up Matched Control Group. The Follow-Up Total Control Group consisted of participants from the Posttest Total Control Group who answered the follow-up posttest questionnaire. The Follow-Up Matched Control Group consisted of all the participants from the Posttest Matched Control Group who answered the follow-up questionnaire. Only 8 of the 18 participants from the Posttest Matched Control Group completed the follow-up posttest

questionnaire, with the majority (6) from the Spring session. In order to accommodate for attrition of 10 respondents from the Posttest Matched Control Group, 10 other participants from the Follow-Up Total Control Group that matched the Follow-Up Experimental Group on levels of loneliness, and whether they participated in the Fall or Spring, were included in the Follow-Up Matched Control group.

Not all scales were used in this part of the analysis. Only scales (or subscales) which showed significant findings for TIME x GROUP or TIME x GROUP x SESSION interactions from pretest to posttest (Part One) were included in the follow-up posttest analysis. This was because the follow-up posttest analysis was geared towards investigating whether changes found at the posttest were sustained over time. Therefore, only scales that showed significant findings using posttest samples will be used for analysis at the follow-up posttest.

The lines of inquiry for this Part Two section are:

1. Were the decreases in loneliness found in the experimental group sustained at the follow-up posttest?
2. Sustained improvements in target problem areas at the follow-up posttest
 - a. Were the use of confidence attachment style and the less use of negative attachment styles (relationships as secondary, need for approval, and preoccupation) in the experimental group sustained at the follow-up posttest?
 - b. Were the increases in social skills found in the experimental group sustained at the follow-up posttest?
 - c. Was less use of negative coping (rumination and passive-avoidant) in the experimental group sustained at the follow-up posttest?

3. Sustained changes of correlates of loneliness at the follow-up posttest

- a. Were the decreases in depression and alcohol abuse found in the experimental group sustained at the follow-up posttest?
- b. Were the increases in self-esteem found in the experimental group sustained at the follow-up posttest?

To investigate these inquiries, the repeated measures MANOVA described in the analysis plan was used in a two step analysis. In the first step, a repeated measures MANOVA was conducted using the Follow-Up Control Group and the Follow-Up Experimental Group from pretest to posttest. If there was a significant TIME x GROUP (or TIME x GROUP x SESSION) interaction along with the experimental group showing significantly greater improvements than the control group, then this finding reiterated the results found in Part One. Thus it indicated that the program had a significant impact on participants of the program immediately after the program ended. The second step entailed conducting another repeated measures MANOVA using the Follow-Up Control Group and Follow-Up Experimental Group using the pretest and follow-up posttest time points (and excluding the posttest time point). Again, if the TIME x GROUP (or TIME x GROUP x SESSION) interaction was significant along with the experimental group showing significantly greater improvements than the control group, this indicated that the program had a long-lasting impact on participants of the program. The two steps combined were able to determine whether there was a sustained effect of the program on the experimental group. To determine if the program effect was sustained, the interactions for step one and step two needed to be significant, which indicated that the program had a significant impact on participants right after the program ended (posttest) and also a semester later (follow-up posttest).

Preliminary analyses of the Follow-Up Matched Control Group with the Follow-Up Experimental Group from pretest to follow-up posttest using repeated measures MANOVA revealed that the effects were not strong enough to reach significance. This was true for the TIME x GROUP interaction and the TIME x GROUP x SESSION interaction for all the scales except the attachment subscale, need for approval. Given the reduced degrees of freedom it was difficult to evaluate the meaning of these non-significant findings. As such for this section, only analyses using the Follow-Up Experimental Group with the Follow-Up Total Control Group were used.

Question 1: Were The Decreases In Loneliness Found In The Experimental Group Sustained At The Follow-Up Posttest?

This first question asked whether the significant decreases in loneliness shown by the experimental group were sustained over time. To investigate this question, individual repeated measures MANOVA analyses of loneliness were conducted using the analysis plan. The Figure 3.11 shows the mean levels of loneliness at the pretest, posttest, and follow-up posttest of the Follow-Up Experimental Group and the Follow-Up Total Control Group.

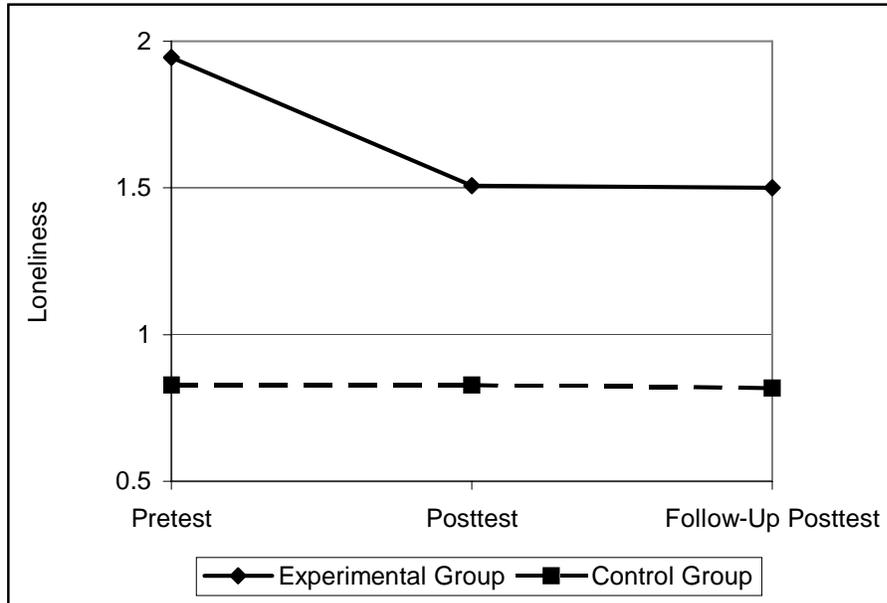


Figure 3.11. Profile plot of TIME x GROUP for loneliness.

The repeated measures MANOVA analysis replicated the previous finding in Part One that there was a greater decrease in loneliness for participants in the experimental group from pretest to posttest, $F(1,156) = 24.91, p < 0.01$. The analysis also showed that this change was sustained over time for the Follow-Up Experimental Group, $F(1,156) = 20.51, p < 0.01$, with the level of loneliness remains relatively constant from posttest to follow-up posttest (1.51 to 1.50). For the Follow-Up Total Control Group, the level of loneliness remained relatively constant throughout all the time points from pretest to follow-up posttest. The significant TIME x GROUP interactions for the pretest to posttest and pretest to follow-up posttest suggested sustained and significant reductions in loneliness from pretest to follow-up posttest for the Follow-Up Experimental Group vs. the Follow-Up Total Control Group. Overall, these findings suggested that the program was successful in producing a sustained reduction in feelings of loneliness over time.

Question 2: Sustained Improvements In Problem Areas At The Follow-Up Posttest

This second question investigated whether improvements found in the target problem areas were sustained at the follow-up posttest. Improvements were found for subscales of attachment style, social skills, and negative coping (rumination and passive-avoidant). Evidence for sustained improvements in these areas would suggest that the program had a long-lasting impact on participants.

Question 2a: Sustained Improvements In Attachment Style?

The posttest analysis in Part One found that four subscales of attachment showed some significantly greater improvements for the experimental group vs. the total control group from the pretest to the posttest. In particular, confidence, relationships as secondary, and preoccupation showed the strongest results, and need for approval showed weaker results from pretest to posttest. The subscale discomfort is not included in these analyses since there were no significant results of the Posttest Experimental Group with the Posttest Total Control Group. This question investigated whether these changes were sustained at the follow-up posttest.

Sustained increases in confidence. Figure 3.12 shows the mean levels of the confidence subscale of attachment at the pretest, posttest, and follow-up posttest for the Follow-Up Experimental Group and the Follow-Up Total Control Group.

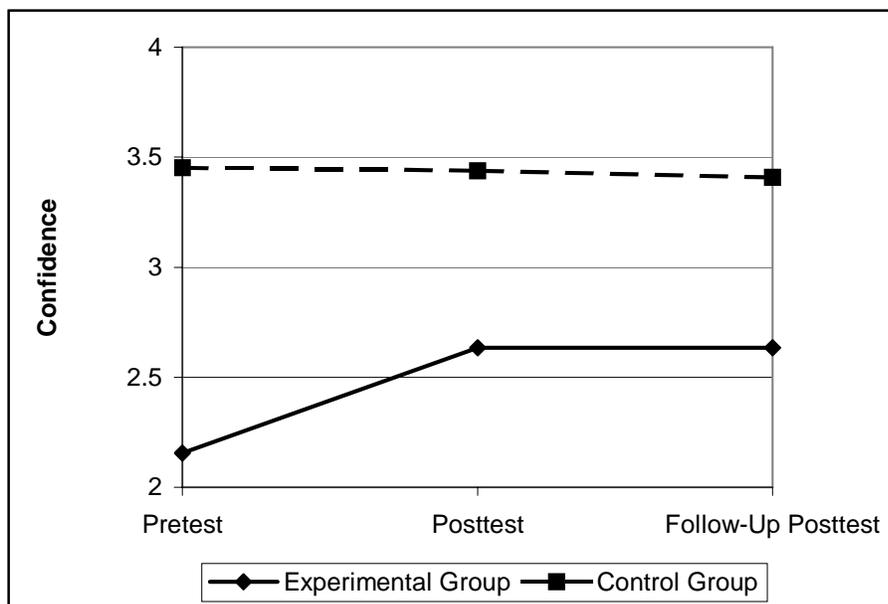


Figure 3.12. Profile plot of TIME x GROUP for attachment subscale, confidence.

There was a significant TIME x GROUP interaction from pretest to posttest, $F(1,156) = 11.37, p < 0.01$, and replicated findings found in Part One, with the experimental group showing a greater increase in confidence than the control group. The Follow-Up Experimental Group also showed sustained levels of increased confidence at the follow-up posttest, with the TIME x GROUP interaction from pretest to follow-up posttest also being significant, $F(1,156) = 11.37, p < 0.01$. The significant TIME x GROUP interactions from pretest to posttest and pretest to follow-up posttest suggested that the improvements made by participants of the program were sustained over time.

Sustained decreases in relationships as secondary, need for approval, and preoccupation. Figure 3.13 shows the mean levels of the three subscales of attachment (relationship as secondary, need for approval, and preoccupation) at the pretest, posttest, and follow-up posttest for the Follow-Up Experimental Group and the Follow-Up Total Control Group.

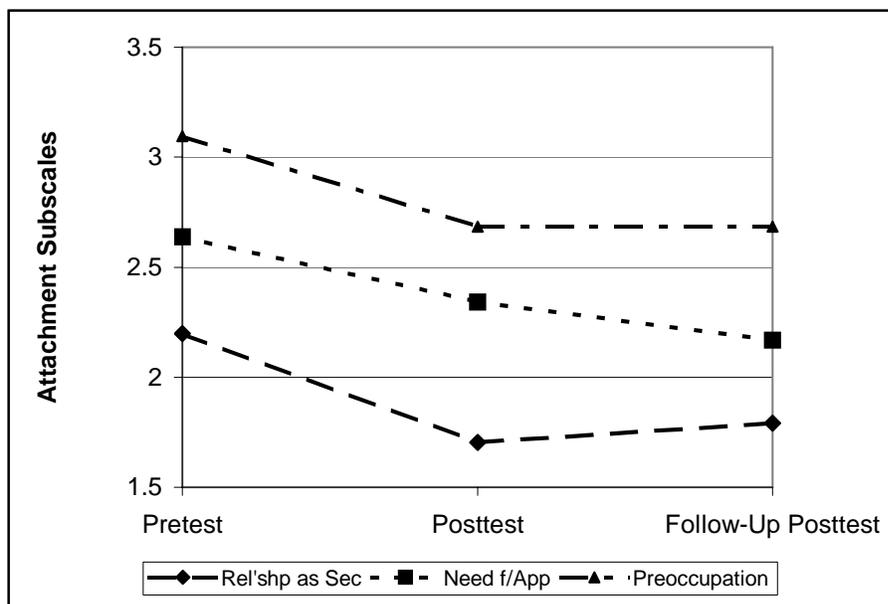


Figure 3.13. Means plot of attachment subscales, relationship as secondary, need for approval, and preoccupation for the experimental group.

The results of Part One found that the attachment subscales, relationships as secondary, and preoccupation had the strongest results for the TIME x GROUP interaction from pretest to posttest. The repeated measures MANOVA using the follow-up samples also produced similar findings from pretest to posttest. The TIME x GROUP interactions for both relationships as secondary [$F(1,156) = 9.31, p < 0.01$] and preoccupation [$F(1,156) = 5.93, p = 0.02$] were significant. Relationships as secondary also had a significant TIME x GROUP interaction from pretest to follow-up posttest, $F(1,156) = 6.42, p < 0.01$, which indicated sustained reductions at the follow-up posttest. For preoccupation however, the results were different. The TIME x GROUP interaction from pretest to follow-up posttest was not significant, $F(1,156) = 1.37, p = 0.24$. Analysis of the means revealed that the Follow-Up Total Control Group showed a steady decrease in preoccupation from pretest to follow-up posttest. The non-significant interaction from pretest to follow-up posttest may be due to the fact the Follow-Up Experimental Group remained exactly the same from posttest to follow-up posttest (2.68 at both times), while the

Follow-Up Total Control Group continued to show decreases in preoccupation from posttest to follow-up posttest (2.62 to 2.51). This made the trends between the experimental group and the control group appear more parallel from pretest to follow-up posttest than from pretest to posttest. The non-significance of the TIME x GROUP interaction from pretest to follow-up posttest for preoccupation therefore may not indicate that the significant reductions for the experimental group changed from posttest to follow-up posttest.

The posttest analyses in Part One also had weaker findings for need for approval. In the follow-up posttest analyses for need for approval, the TIME x GROUP interaction from pretest to posttest was $F(1,156) = 2.28, p = 0.13$. This result is different from the posttest analyses, which found that the TIME x GROUP interaction from pretest to posttest was significant for the Posttest Experimental Group and the Posttest Total Control Group. However, the result from pretest to follow-up posttest was $F(1,156) = 4.09, p = 0.05$ which indicates that the experimental group significantly decreased in need for approval at the follow-up posttest compared to the total control group. There was not enough evidence to indicate a significant sustained reduction in need for approval at the follow-up posttest; however, a combination of the pretest to posttest results from Part One and the pretest to follow-up posttest results in Part Two indicated that there might have been a sustained reduction in need for approval.

Summary. For the most part, the results suggested that the improvements in attachment style were sustained at the follow-up posttest. Two subscales, confidence and relationships as secondary, showed significant TIME x GROUP interactions from pretest to posttest and pretest to follow-up posttest. This indicates that the significant increases in confidence and the decreases in relationships as secondary were sustained at the follow-up posttest. The levels of preoccupation from posttest to follow-up posttest for the Follow-Up Experimental Group were

exactly the same however, because of decreases in preoccupation for the Follow-Up Total Control Group, the TIME x GROUP interaction from pretest to follow-up posttest was not significant. Thus, the lack of significance was due to changes in the control group rather than the experimental group reverting to pretest levels of the preoccupied attachment style at the follow-up posttest. Finally, need for approval had a significant TIME x GROUP interaction from pretest to follow-up posttest but not from pretest to posttest. Although there was not enough evidence to suggest a sustained reduction in need for approval at the follow-up posttest, the pretest to posttest results from Part One and the pretest to follow-up posttest results in Part Two suggest that there might have been a sustained reduction in need for approval

Question 2b: Sustained Increases In Social Skills?

This second question investigated whether the improvements made from pretest to posttest in social skills were sustained at the follow-up posttest. Figure 3.14 shows the mean levels of the overall social skills scale at the pretest, posttest, and follow-up posttest of the Follow-Up Experimental Group and the Follow-Up Total Control Group.

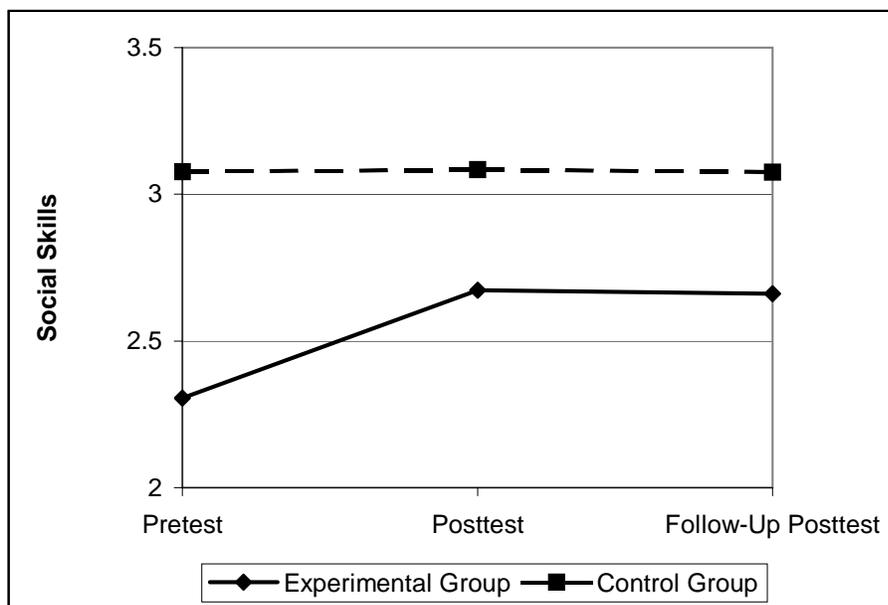


Figure 3.14. Profile plot of TIME x GROUP for social skills.

This is consistent with the posttest findings; the TIME x GROUP interaction from pretest to posttest showed a significantly greater increase in social skills for the experimental group than the total control group $F(1,156) = 7.44, p = 0.01$. Figure 3.14 shows that this change was sustained over time for the Follow-Up Experimental Group: the degree of social skills remained relatively constant from posttest to follow-up posttest (2.67 to 2.66). For the Follow-Up Total Control Group, the degree of social skills remained relatively constant (at 3.08) throughout all the time points from pretest to follow-up posttest. The significant TIME x GROUP interactions from pretest to posttest and pretest to follow-up posttest, $F(1,156) = 5.01, p = 0.03$, showed that the increase in social skills was significantly sustained over time. These findings suggested that the program was successful in not only increasing participants' degree of social skills but that it was retained over time after the program ended. Findings for the subscale, social skills with strangers, were also similar to the overall social skills scale.

Question 2c: Was Less Use Of Negative Coping Sustained At The Follow-Up Posttest?

Part One analysis using posttest samples found that the subscales rumination and passive-avoidant coping showed significant reductions from pretest to posttest for the experimental group vs. the control group. In the case of passive-avoidant coping, significant reductions were found only for the Fall experimental group. Below are the repeat measures MANOVA for rumination and passive-avoidant coping using the analysis plan geared towards determining whether these significant reductions were sustained at follow-up posttest.

Rumination. Figure 3.15 shows the mean levels of the coping subscale, rumination, at the pretest, posttest, and follow-up posttest for the Follow-Up Experimental Group and the Follow-Up Total Control Group.

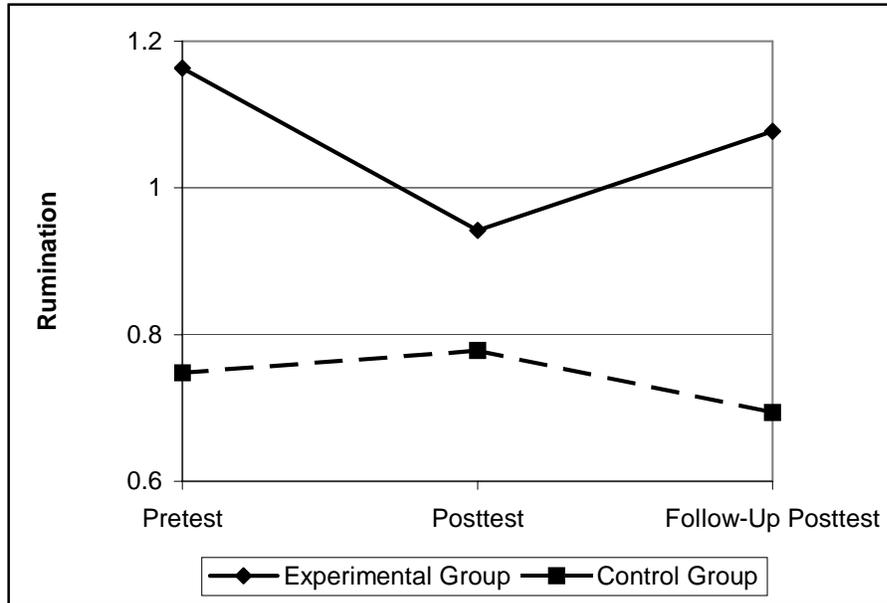


Figure 3.15. Profile plot of TIME x GROUP for coping subscale, rumination.

The pretest to posttest TIME x GROUP interaction was significant, $F(1,156) = 4.95, p = 0.03$, but the pretest to follow-up posttest TIME x GROUP interaction was not significant, $F(1,156) = 0.01, p = 0.84$. These interactions suggested that the decreases were not sustained at the follow-up posttest. Participants therefore, were regressing to using rumination as a means of coping with loneliness. It appears that while the program made an impact on helping participants use less ruminative coping, this impact was short term and participants lapsed back into using this type of coping at the follow-up posttest.

Passive-Avoidant. The figure below shows the mean levels of the coping subscale, passive-avoidant coping, at the pretest, posttest, and follow-up posttest for the Fall Group of the Follow-Up Experimental Group and the Follow-Up Total Control Group.

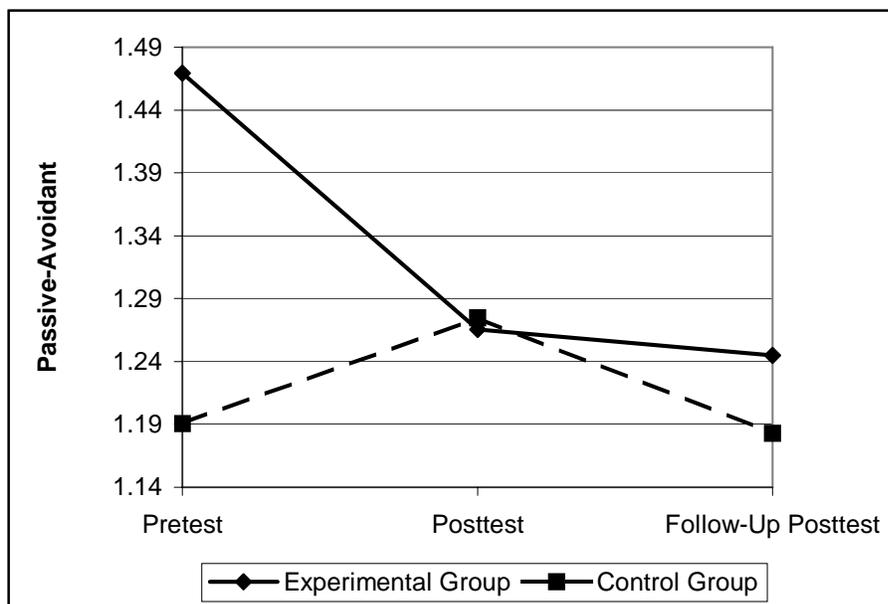


Figure 3.16. Profile plot of TIME x GROUP x SESSION for coping subscale, passive-avoidant.

Similar Part One, the TIME x GROUP x SESSION interaction for passive-avoidant coping from the pretest to the posttest was close to significant, $F(1,156) = 2.24, p = 0.14$. In addition, the TIME x GROUP x SESSION interaction from pretest to follow-up posttest was significant, $F(1,156) = 3.87, p = 0.05$. This could be because the Fall experimental group continued to show a decrease in passive-avoidant coping from posttest to follow-up posttest (1.27 to 1.25) and the control group reported follow-up posttest levels of passive-avoidant coping similar to the pretest level. These results suggested that over time the program helped participants in the Fall experimental group make significantly greater reductions in passive-avoidant coping than the Fall control group.

Summary. This question investigated whether the decreases in negative coping (rumination and passive-avoidant coping) were sustained at the follow-up posttest. The results showed that participants of the experimental group reported levels of ruminative coping at the follow-up posttest that were similar to pretest levels. This indicated that the decreased levels of ruminative coping at the posttest were not sustained at the follow-up posttest. The results for

passive-avoidant coping suggested that participants of the program had a significant reduction in this coping behavior at the follow-up posttest.

Conclusion

This section investigated whether the improvements in attachment styles, social skills, and coping attributed to the program were sustained at the follow-up posttest. The results provided evidence that this is the case for attachment, with sustained increases in confidence, and sustained decreases in negative attachment, particularly for the subscale, relationships as secondary. The results also showed that the increases in social skills were sustained at the follow-up posttest. The evidence was weaker for coping. In the case of rumination, the analysis suggested that participants were reverting to using rumination as a means of coping with loneliness. However, with passive-avoidant coping, participants in the Fall experimental group showed significant reductions at the follow-up posttest.

Question 3: Sustained Changes Of Correlates Of Loneliness At The Follow-Up Posttest

This final section investigated whether there were sustained changes of the correlates of loneliness at the follow-up posttest. In particular, depression, alcohol abuse, and self-esteem showed changes from pretest to posttest in Part One analyses. These correlates were investigated to determine if the changes were sustained at the follow-up posttest.

Question 3a: Were the decreases in depression and alcohol abuse found in the experimental group sustained at the follow-up posttest?

Depression. Figure 3.17 shows the mean levels of depression at the pretest, posttest, and follow-up posttest of the Follow-Up Experimental Group with the Follow-Up Total Control Group.

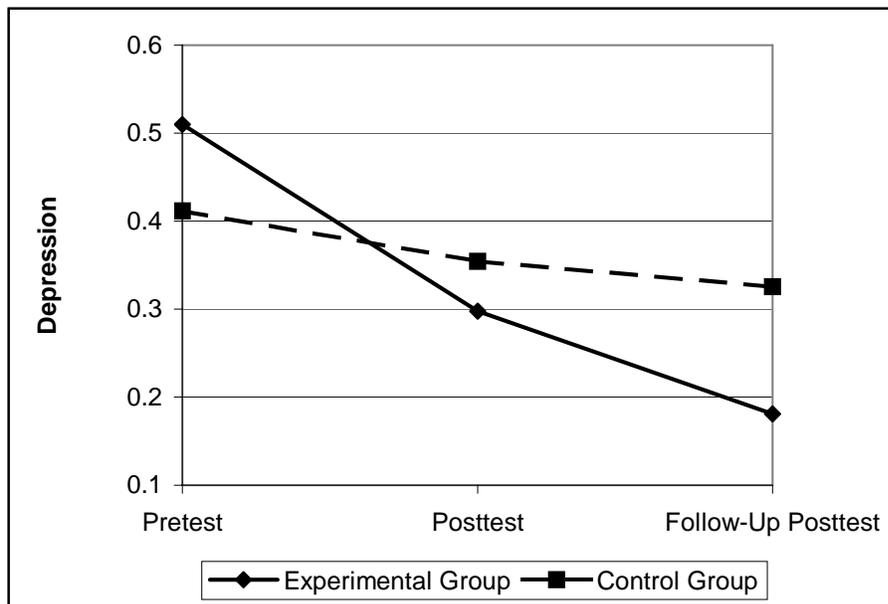


Figure 3.17. Profile plot of TIME x GROUP for depression.

The repeated measures MANOVA analysis revealed that the TIME x GROUP interactions from pretest to posttest, $F(1,156) = 5.03, p = 0.03$, and pretest to follow-up posttest, $F(1,156) = 9.56, p < 0.01$, were significant. These two significant interactions implied that the program was not only successful in reducing the level of depression of the Experimental group at the end of the program, but also that there was a sustained reduction in depression at the follow-up posttest.

Alcohol Abuse. Figure 3.18 shows the mean levels of alcohol abuse at the pretest, posttest, and follow-up posttest of the Follow-Up Experimental Group with the Follow-Up Total Control Group.

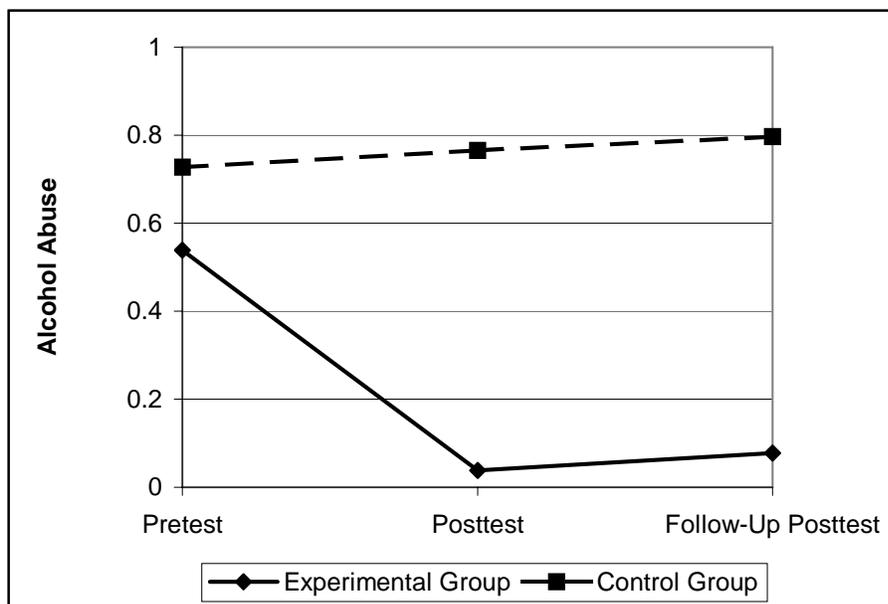


Figure 3.18. Profile plot of TIME x GROUP for alcohol abuse.

The TIME x GROUP interaction from pretest to posttest was significant, $F(1,156) = 15.11, p < 0.01$, and replicated findings found in Part One. In addition, the significant TIME x GROUP interaction from pretest to follow-up posttest, $F(1,154) = 11.23, p < 0.01$, also suggested that the significant reductions in alcohol abuse found at the posttest were sustained at the follow-up posttest.

The TIME x GROUP x SESSION interaction was also significant for both the pretest to posttest, $F(1,156) = 14.37, p < 0.01$, and pretest to follow-up posttest, $F(1,154) = 5.40, p = 0.02$. In the posttest analysis of Part One, the Spring experimental group had shown a drastic reduction in alcohol abuse, with the Fall experimental group showing a constant but very low level of alcohol abuse. In Part Two, analysis of the means, along with the significant TIME x GROUP x SESSION interactions from pretest to posttest and pretest to follow-up posttest, also confirmed this pattern and suggested a sustained reduction in alcohol abuse for the Spring experimental group. Overall, the analysis provided evidence that the reduction of alcohol abuse attributed to the program was sustained in the follow-up posttest.

Question 3b: Were the increases in self-esteem found in the experimental group sustained at the follow-up posttest?

Figure 3.19 shows the mean levels of the self-esteem scale at the pretest, posttest, and follow-up posttest for the Fall session of the Follow-Up Experimental Group with the Follow-Up Total Control Group. A similar figure for the Spring session is not shown because it did not have a similar TIME x GROUP interaction pattern showing greater improvements for the experimental group.

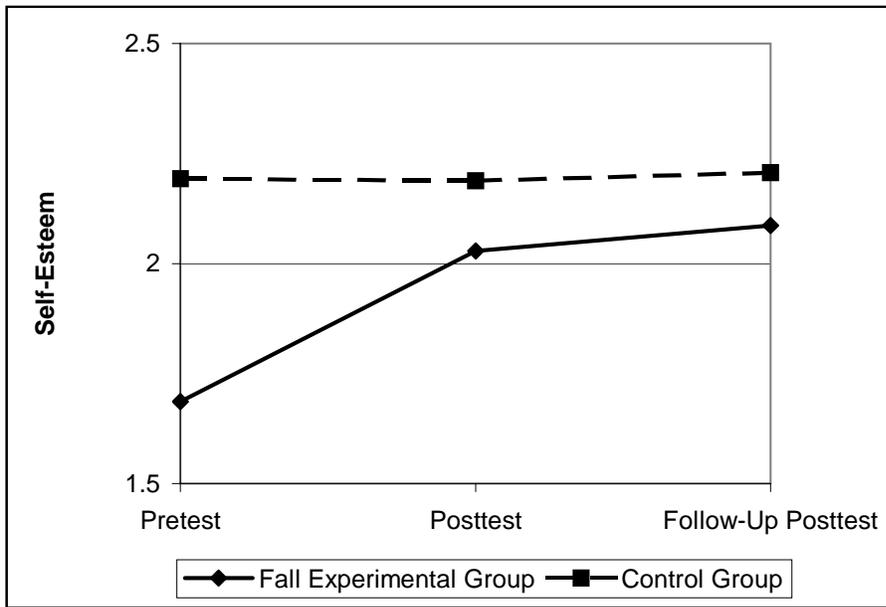


Figure 3.19. Profile plot of TIME x GROUP for self-esteem for fall session.

The findings for the self-esteem scale using the Follow-Up Experimental Group and Follow-Up Total Control Group reiterated the results of the posttest analysis (Part One) using the Posttest Experimental Group and the Posttest Matched Control Group. Namely, that there was a significant TIME x GROUP x SESSION interaction, $F(1,155) = 4.38, p = 0.04$, but not a significant TIME x GROUP interaction from pretest to posttest. In particular both findings showed that the Fall experimental group had significant increases in self-esteem from pretest to posttest than the control group. The Follow-Up Total Control Group showed a relatively stable

level of self-esteem from pretest to follow-up posttest. Both the TIME x GROUP x SESSION interactions from pretest to posttest and pretest to follow-up posttest [$F(1,156)=4.98, p=0.03$] were significant and suggested that the significant increase in self-esteem for the Fall experimental group was sustained at the follow-up posttest.

Conclusion

This section questioned whether depression and alcohol abuse showed sustained reductions and self-esteem showed significant increases at the follow-up posttest. The results showed that the changes for all three correlates were sustained at the follow-up posttest. Depression showed a sustained decrease at the follow-up posttest, the Spring experimental group showed sustained reductions in alcohol abuse, and the Fall experimental group showed sustained increases in self-esteem. The program therefore appeared to make sustained changes of other areas of program participants' lives.

Part Two Conclusion

Part Two of this chapter investigated whether changes were sustained at the follow-up posttest. In the majority of the scales, it appeared that the changes brought about by the program at the posttest were sustained at the follow-up posttest. Loneliness, some subscales of attachment, social skills, depression, alcohol abuse, and self-esteem showed sustained improvements at the follow-up posttest, after significant changes from pretest to posttest. The only clear negative finding came from the coping subscale, rumination, which showed a non-significant interaction from pretest to follow-up posttest with levels of rumination at the follow-up posttest returning to pretest levels in the experimental group. For the most part, it appeared that the program made changes in participants that had an impact 4-5 months after the program had ended.

Chapter Conclusion

Analysis of the results provided evidence that the program had a significant impact on participants. Firstly the results showed that the program worked because there were significantly greater reductions in loneliness for experimental group participants than control group participants from pretest to posttest. Secondly some problem areas that the program targeted (attachment style, social skills, coping) also showed improvements in participants of the experimental group. Only two attachment subscales, discomfort and need for approval, had weaker results, and positive coping did not have significant results. Also, the results showed that there were changes in other areas of the lives of participants including less depression, less alcohol abuse, and improved self-esteem.

The results also suggested that these changes that occurred were not transient – the program made a lasting impact on participants. Except for one subscale, all the other scales that showed improvements from pretest to posttest also was sustained at the follow-up posttest. Overall, the program appeared to have a significant positive impact on experimental group participants.

CHAPTER 4: PROGRAM MONITORING RESULTS

Introduction

This second chapter presents the program monitoring results; it examines whether the program was successful in functioning as intended. Three main components were evaluated for program monitoring: (A) program performance, (B) participants' level of participation, and (C) week to week emotional states. In addition, each of these three main components had sub-components.⁵

The main instrument used for program monitoring was the weekly questionnaire completed by the experimental group. All participants in the Experimental Group were used in the program monitoring analyses.

In order to determine whether the program successfully performed as intended in the three main components, there were three areas of investigation. The first area explored the means and mode of scores for measures within each component. Looking at the average scores can provide a rough idea of how participants were rating different parts of the program. For example, a mean score of 3.6 on a scale from 0 (strongly disagree) to 4 (strongly agree) for the item "Overall I am satisfied with the program so far" would provide preliminary evidence that participants were satisfied with the program. However, because there are not reference points for items, one cannot determine whether 3.6 was a significant degree of satisfaction or not. Repeating the program several times may, for example, reveal that on average, participants rate satisfaction higher than 3.6 and further statistical tests could reveal 3.6 as a low degree of satisfaction relative to that average. Given the lack of reference points, one can only make face-value evaluations of item scores to suggest whether they were high or not. These face-value

⁵ See Table 2.1 on page 22 for a complete list of components, sub-components and items in each sub-component.

evaluations though provide some initial insights into program monitoring and how well the program functioned.

The second area explored the variations in scores of sub-components across the five weeks. In some cases, significant variations in sub-component scores across the five weeks could suggest that the program (or parts of the program) was functioning well certain weeks and not at other weeks. This information is useful in helping to determine what parts of the program would need improving should the program be implemented again. There are five sub-components for which the expectation is that they remain at a constant, 'high' level across the five weeks. These sub-components are: relevance of topic, usefulness of social skills, satisfaction, effectiveness of facilitator, and degree of participants' time & effort. There were, however, other cases where increases in sub-component scores across the five weeks would indicate that the program was performing successfully. These sub-components are: group cohesion, reduction in feelings of loneliness and sadness, and feelings of confidence and satisfaction with self. In these cases there was no expectation of a high score at the outset, but through participation in the program, it was expected the scores would gradually increase over time.

Since the program was conducted twice, once in the Fall and once in the Spring, a third area of investigation looked at whether the program functioned equally well at both times, or whether the program functioned better for one session and not the other. These differences could have implications for interpretation of the results of program effectiveness. For example, if the program had a greater impact on the Fall session than the Spring session, and program monitoring showed that the program also functioned better for the Fall session than the Spring

session, it could suggest that the way the program functioned had an effect on the impact it made on participants.

There were two differences between the sessions that were investigated: the trends across the five weeks for both sessions, and the sub-component mean scores between the sessions. In the first instance, one can look at the trends for both sessions to determine whether they are parallel or not. Parallel trends may indicate from week to week, the program functioned the same way for both sessions. For example, if the trends for group cohesion for both groups showed a parallel, linear increase across the five weeks, it may suggest that the program was effective in promoting group cohesion in both sessions. However, if the two sessions showed dissimilar patterns, e.g., one increased and the other remained level, this may suggest instead that the program was effective at promoting group cohesion for one session but not other. In the second instance, differences in sub-component mean scores would provide information about whether the scores across the five weeks were the same on average for both sessions. Significant differences in mean scores could imply that the program functioned differently for the sessions. For example, if the Spring session rated the relevance of topic greater than the Fall session, this could imply that the topics were relevant to the Spring session more than the Fall session. If later analyses showed that the program had a greater impact on the Spring session, it could imply that the greater relevance of topic was one factor in the greater impact.

In summary, there are three main areas of investigation for program monitoring:

1. What were the frequency and mean of the scores across sub-component items?
2. Were there variations in sub-component scores across the five weeks? What did these variations look like?
3. Differences between the Fall and Spring sessions across the five weeks.

- a. Were there parallel trends in the Fall and Spring sessions?
- b. Were there mean differences in sub-component scores between sessions?

Analysis Plan

In order to assess the last two areas of investigation for program monitoring (that is, variations in sub-component scores across the five weeks, and differences between the Fall and Spring sessions) repeated measures MANOVA were calculated for each sub-component using the weekly questionnaire data. The results of interest from this procedure include main and interaction effects, between-subjects factor results, growth curve analysis, and simple contrasts.

There were two independent factors, TIME and SESSION. TIME was a within subjects factor that looked at the scores across the five weeks. SESSION was the between subjects factor used to determine whether participants were in either the Fall or Spring session. There was one dependent factor, ITEMS. ITEMS was a within subjects factor, equivalent to a sub-component, and consisted of two or more weekly questionnaire items. So, for example, the sub-component reduced feelings of loneliness and sadness is made up of two weekly questionnaire items. These two items together constitute the ITEM factor for reduced feelings of loneliness and sadness that was tested in the repeated measures MANOVA analysis.

Figure 4.1 is an example showing the structure of a repeated measures MANOVA for the sub-component, reduced feelings of loneliness and sadness. The black shaded region shows the between subjects factor SESSION, the gray shaded region shows the ITEM within subjects factor and the non-shaded region shows the TIME within subjects factor. One can see that TIME looks at the scores across the five weeks of each of the two questionnaire items constituting ITEM. This structure is repeated for the Fall session and the Spring session.

SESSION											
Fall	ITEM	This week I feel less lonely than last week					This week I feel less sad than last week				
	TIME	Week 1	Week 2	Week 3	Week 4	Week 5	Week 1	Week 2	Week 3	Week 4	Week 5
Spring	ITEM	This week I feel less lonely than last week					This week I feel less sad than last week				
	TIME	Week 1	Week 2	Week 3	Week 4	Week 5	Week 1	Week 2	Week 3	Week 4	Week 5

Figure 4.1. Example of the structure for the repeated measures MANOVA of reduced feelings of loneliness and sadness

Using the repeated measures MANOVA, two main areas of program monitoring can be investigated. The first of these main areas questioned whether there were differences in sub-component scores across the five weeks. To answer this question three results of the repeated measures MANOVA can be used. First, the within subjects main effect result, TIME, was used to determine if the scores across the five weeks were equal. So, for example, an analysis of TIME for the sub-component, relevance of topic, would be able to determine if all topics were equally relevant or, if at least one topic's level of relevance was different from the others. If it turns out that TIME was significant (i.e., at least one week was significantly different from the other weeks), then the second result, the growth curve analysis, can determine the shape of the curve (whether it was linear, quadratic, etc.). Finally, using the simple contrast results, separate tests for Week 2 with the subsequent weeks (Weeks 3-6), and Week 6 from the preceding weeks (Weeks 2-5), can be used to determine if there were significant differences from Week 2 to any of the other weeks or from any of the preceding weeks to Week 6.

The second main area questioned the differences between the Fall and Spring sessions. There were two lines of inquiry here: first, whether both groups showed parallel trends across the five weeks, and second, whether there was a significant difference in the sub-component mean

scores for the Fall and Spring sessions. To determine whether the Fall and the Spring sessions showed parallel trends the interaction TIME x SESSION can be used. A significant interaction between TIME and SESSION would suggest that the trends for the sessions were not parallel. Finally, to answer the other question concerning the mean differences between sub-component scores for the two sessions, the between subjects test of SESSION can be used to determine whether the mean scores of the Fall session and the Spring session were significantly different from each other.

Missing Data

Because a repeated measures design was used to analyze the weekly questionnaire data, and also the small sample size of the dataset, there was special treatment of missing cases. Since a repeated measures design does not allow for missing cases, any missing data for a specific week was replaced with a mean of the set of cases from other participants defined by the question, the week, and the session of which that missing case was an element. So, for example, if there was a missing case for question 5 from week 3 of the Fall session, that missing case was replaced with the mean of the remaining cases of other people for question 5 from week 3 of the Fall session. This specificity was an attempt to replace the missing case with a value that would be representative of that sub-sample. The percentages of missing cases for a question from a certain week and for either session were relatively small. On average, 17.7% of the Fall cases and 8.6% of the Spring cases were missing from any question of a certain week. In all, missing cases ranged from 0% to 33% for any question of a certain week in either session.

Program Performance

This first component of program monitoring focused on the performance of the program in four main areas (sub-components): the relevance of topics presented (relevance of topic), the

degree of satisfaction with the program (satisfaction), whether group members felt closer to each other (group cohesion), and the how effective was the facilitator in conducting meetings (effectiveness of facilitator). Each of these sub-components was geared to measure the performance of some aspect of program and can provide vital information as to whether these aspects were performing at an acceptable level. Each of these four main sub-components is reported on below.

Relevance Of Topic

Analysis of this sub-component investigated whether the topics presented for each of the five weeks were relevant. To assess, relevance of topic, there were 3 items from the weekly questionnaire: the relevance of the modules, how much insight was gained into reducing loneliness, and to what degree they learned new things about themselves. It is expected that the scores for each of these three items remain high across the five weeks, which would indicate that the all the topics presented were relevant. If one or more topics were not relevant, especially for both sessions, this would indicate that future programs need to consider revising the topics in question, or replacing them with alternative topics. For relevance to topic, therefore, there were three important areas of investigation as stated in the chapter introduction: 1. Were the mean and mode scores across sub-component items high across the five weeks? 2. Were there variations in sub-component scores across the five weeks? 3. Were there differences between the Fall and Spring sessions across the five weeks? To investigate question 1, the means and modes of the scores for each item across the five weeks were used, and for questions 2 and 3, application of the repeated measures MANOVA described in the analysis plan was used.

Question 1: Were The Mean And Mode Scores Across Sub-Component Items High Across The Five Weeks?

The mean scores the three items in relevance of topic were: 3.07 (relevance of module), 2.94 (gained new insights), and 2.81 (learned new things about self) on a scale ranging from 0 (strongly disagree) to 4 (strongly agree). The modes for the three items were: 4 for ‘relevance of module’, 3 for ‘gained new insights’, and 3 for ‘leant new things about self.’ The means and modes suggested that, on average, participants either ‘agreed’ or ‘strongly agreed’ that the topic for each week was relevant.

Question 2: Were There Variations In Sub-Component Scores Across The Five Weeks?

To answer this question the repeated measures MANOVA described in the analysis plan

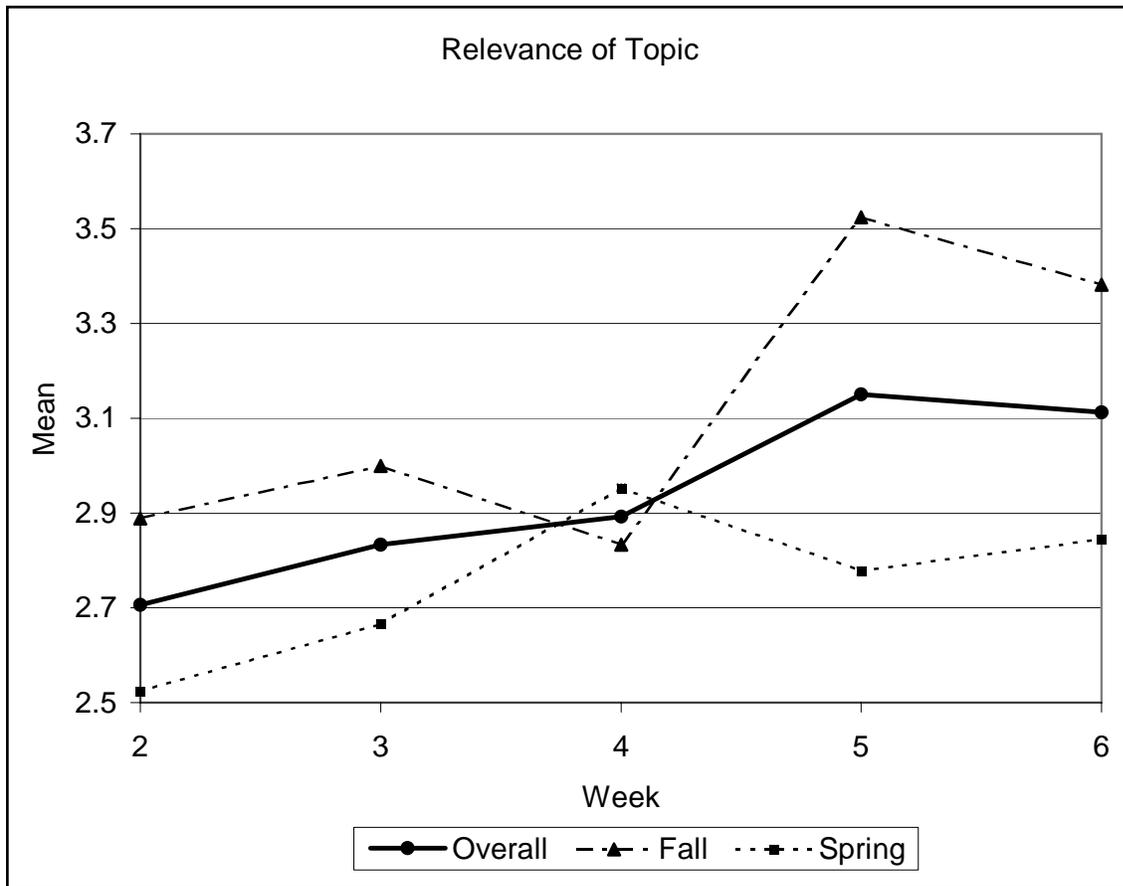


Figure 4.2. Profile plot of TIME and TIME x SESSION for sub-component, relevance of topic.

was used. The 3 items of this sub-component were used in the ITEMS factor of the repeated measures design. Fluctuations from week to week for relevance of topic is shown in Figure 4.2, which shows the profile plot of the main effect, TIME, and the interaction of TIME x SESSION.

Figure 4.2 shows that there were some fluctuations from week to week for relevance of topic. Statistical analyses using the repeated measures MANOVA revealed that across the three items, there was a significant main effect for TIME: $F(4,11) = 4.28, p = 0.03$. This suggested that there were significant differences across the five weeks. The mean for the relevance of topic increased from 2.71 in Week 2 to 3.11 in Week 6 and simple contrast tests revealed that Week 5, $F(1,14) = 7.76, p = 0.02$, and Week 6, $F(1,14) = 8.42, p = 0.01$ were significantly different from Week 2. Therefore the last two topics were significantly more relevant than the first topic. This finding may suggest that either the first topic needs to be improved or that the nature of the last two topics (which deals with more complex, interpersonal information) made them, by design, more relevant than the first topic.

Question 3: Were There Differences Between The Fall And Spring Sessions Across The Five Weeks?

This question had two parts, the first part looked at whether there were parallel trends in the Fall and Spring sessions, and the second part looked at the mean differences in sub-component scores between sessions. The first part provided information on whether each session showed similar ratings on relevance of topic for each week, while the second part gave information about whether on average both sessions rated relevance of topic equally. Again, the repeated measures MANOVA was used to answer these questions.

For the first part, Figure 4.2 shows that there were nonparallel trends for the Fall and Spring sessions. Statistical analysis provided evidence that these nonparallel trends were

significant as shown by the significant interaction effect TIME x SESSION, $F(4,11) = 2.54, p = 0.10$. While both sessions showed a general increase over time, Fall and Spring participants had different ratings for which topic was the most relevant. Participants of the Fall session thought the most relevant topic was Week 5 (Topic: Conceptions of self and other: Automatic thoughts and feelings), whereas participants of the Spring session thought the most relevant topic was Week 4 (The public vs. private self). The difference in rating of relevance of topic could reflect varying needs of the Fall and Spring sessions.

For the second part, the between subjects test for SESSION was used to determine if there were mean differences between the sessions. The test revealed that there was no significant mean differences in sub-component scores between the Fall and Spring session for relevance of topic, $F(1,14) = 2.48, p = 0.14$.

Usefulness Of Social Skills

For Week 2 through 6, participants were taught listening and communication social skills and the usefulness of social skills sub-component evaluated whether participants thought that the social skills they were taught across those five weeks were useful. There was only one item in the weekly questionnaire for this sub-component asking them about the usefulness of the social skill taught for that week. It is expected that scores for this sub-component would also remain high across the five weeks, indicating that all the social skills were useful. Fluctuations in the rating of usefulness of social skills may suggest that improvements need to be made. For this sub-component therefore, there are three important areas of investigation as highlighted in the chapter introduction and similar to the relevance of topic subcomponent.

Question 1: Were The Mean And Mode Scores Across Sub-Component Items High Across The Five Weeks?

The mean and mode scores for the item in this subcomponent are very similar (mean: 3.19 and mode: 3) and suggested that on average participants ‘agreed’ that the social skills taught were useful. This suggested a relatively high rating for usefulness of social skills taught.

Question 2: Were There Variations In Sub-Component Scores Across The Five Weeks?

The repeated measures MANOVA was used to answer this question. Figure 4.3 shows fluctuations in their ratings for this sub-component from week to week.

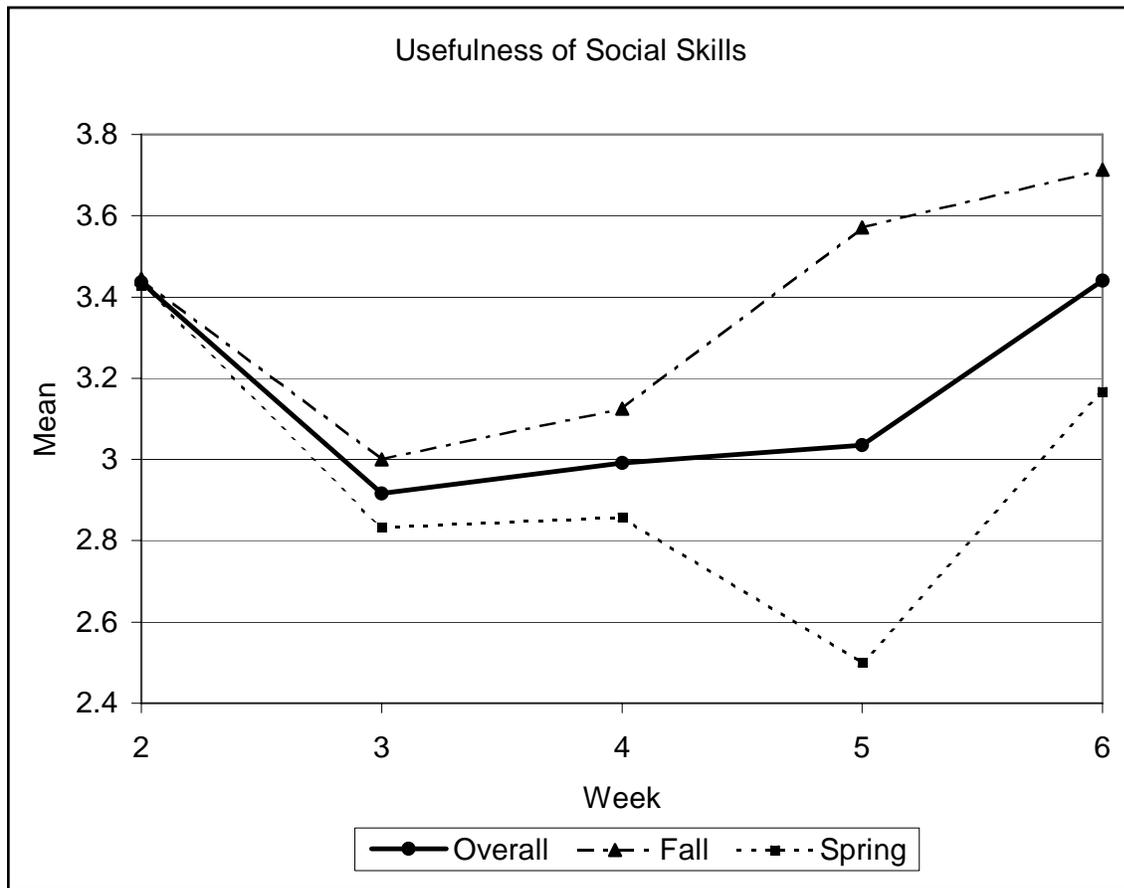


Figure 4.3. Profile plot of TIME and TIME x SESSION for sub-component, usefulness of social skills.

Figure 4.3 does show some fluctuations from week to week in the program, with a dip the scores towards the middle of the program and then a rise towards the end. Repeated measures MANOVA revealed that these fluctuations were significant, with a significant main effect for TIME, $F(4,11) = 6.14, p < 0.01$. The overall mean started at 3.44, dipped to a low point of 2.92, and at Week 6 was at the same level as the starting point. Simple contrast tests showed that the decreases in scores from Week 3 to Week 5 were significantly different from Week 2, however, Week 6 was not significantly different from Week 2. Weeks 3 and 4 were also significantly different from Week 6. The analysis suggested that some of the social skills were more useful than other social skills and may imply that some of the social skills taught need to be replaced or improved. It was also possible that participants had greater trouble using social skills towards the middle of the program.

Question 3: Were There Differences Between The Fall And Spring Sessions Across The Five Weeks?

Again, this question had two parts, one looking at parallel trends between the Fall and Spring sessions, and the other looking at the mean differences in sub-component scores between sessions. For the first part, Figure 4.3 shows that for the Fall session there was more of a positive trend with the score for Week 6 (3.71) being greater than Week 2 (3.44). Although the Spring session also started at the same level (3.43) at Week 2, their final score for Week 6 was lower than their starting level (3.17). The repeated measures MANOVA also suggested the trends are significantly nonparallel with the interaction effect, TIME x SESSION being significant $F(4,11) = 2.82, p = 0.08$. The differences between the two sessions may be due to different needs of participants or that there were some discrepancies in how the skills were taught in the Fall and the Spring.

For the second part, the between subjects test of the repeated measures MANOVA was used. The test revealed that there was a significant difference between the Fall and Spring sessions, $F(1,14) = 3.85, p = 0.07$. Figure 4.3 shows that the scores for the Fall group were greater than the Spring group. The between subjects test therefore suggested that participants in the Fall session thought the social skills taught were more useful than the participants in the Spring session.

Satisfaction

This sub-component was geared towards assessing participants' general satisfaction with the program from week to week. There were two items from the weekly questionnaire that were used for this sub-component: how satisfied participants were with the program for that week and how glad participants were that they came to the weekly meeting. The expectation for the level of satisfaction was that it remained high from week to week. Low scores in satisfaction may suggest that the program was not fulfilling participants' expectations or needs. Fluctuations from week to week may also suggest that this may be true of some weeks and not others. Again, for this sub-component, the three main areas were investigated as stated in the chapter introduction.

Question 1: Were The Mean And Mode Scores Across The Sub-Component Items High Across The Five Weeks?

Average scores for each of the items in this sub-component were relatively high. For means, 3.41 was the average score for participants being satisfied with the program and 3.58 for participants reporting that they were glad that they came to the meeting. The mode score for both items was 4. The mode score suggested that participants most frequently 'strongly agreed' with satisfaction items, and the mean score also suggesting that participants tended towards 'strongly agreeing' as well.

Question 2: Were There Variations In Sub-Component Scores Across The Five Weeks?

Repeated measures MANOVA was used to answer this question with the two items of this sub-component entered as the ITEMS factor. Figure 4.4 shows the profile plots across the five weeks illustrating any fluctuations that occurred from week to week with satisfaction.

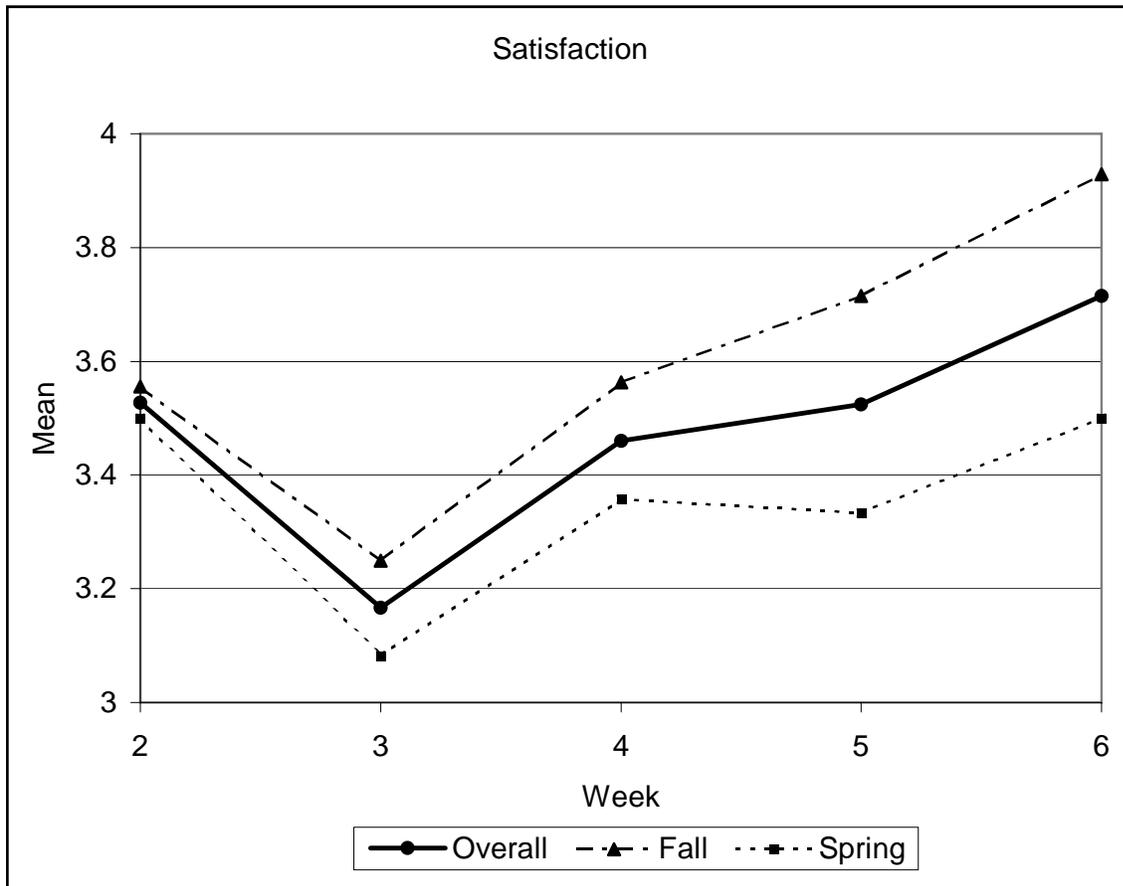


Figure 4.4. Profile plot of TIME and TIME x SESSION for sub-component, satisfaction.

Figure 4.4 does show some fluctuations from week to week for satisfaction. The repeated measure MANOVA found significant differences from week to week, with the main effect, TIME, being significant $F(4,11) = 9.23, p < 0.01$. Simple contrast tests revealed that the decrease in scores from Week 2 to Week 3 was significant, $F(1,14) = 10.56, p < 0.01$, and Weeks 3 to 5 were significantly different from Week 6. This suggested that satisfaction increased significantly from Week 3 to Week 6. This pattern was interesting because, while it

violates the initial expectation of high satisfaction for all of the five weeks, it showed a more therapeutic pattern with a decrease in the middle of the program and then an increase towards the end of the program. Growth curve analysis also confirmed the significance of the shape of the curve suggesting that the changes followed a quadratic pattern $F(1,14) = 41.75, p < 0.01$.

Question 3: Were There Differences Between The Fall And Spring Sessions Across The Five Weeks?

Similar to previous analyses, this question had two parts, investigating the parallel trends and the difference in mean sub-component scores. For the first part, Figure 4.4 shows that the trends between the Fall and Spring sessions were mostly parallel, and the repeated measure MANOVA suggested a similar finding with the interaction of TIME x SESSION being non-significant, $F(4,11) = 0.59, p = 0.68$. Despite differences in other sub-components, both sessions varied similarly on their levels of satisfaction from week to week. For the second part, the between subjects test was not significant, $F(1,14) = 2.41, p = 0.22$, and suggested that both Fall and Spring participants reported similar levels of satisfaction.

Group Cohesion

The main purpose of this sub-component was to ascertain whether participants felt closer to the group from Week 2 to Week 6 with the effect that participants also felt comfortable disclosing information to others. Thus this sub-component had three items associated with it, level of comfort disclosing information to the group, feelings of closeness to the group, and the ability to talk about personal experiences with the group. Unlike the previous sub-components discussed, the expectation for this sub-component was that the scores increased over the five weeks as participants grew closer to each other over time. If group cohesion did not increase across the five weeks, this may suggest that the program did not create an atmosphere that

allowed for group bonding. This in turn could affect the group process and outcomes the group could have experienced. The main areas of investigations in this case are focused on first, whether there were variations in sub-component scores across the five weeks and if there are differences, are they showing a positive trend? Second, are these differences are the same for the Fall and Spring sessions.

Question 1: Were There Variations In Sub-Component Scores Across The Five Weeks And If There Are Variations, Are They Showing A Positive Trend?

To answer this question, the repeated measures MANOVA was used with the ITEMS factor containing the three items of this sub-component. Figure 3.5 shows the profile plots across the five weeks and illustrates any changes that occurred.

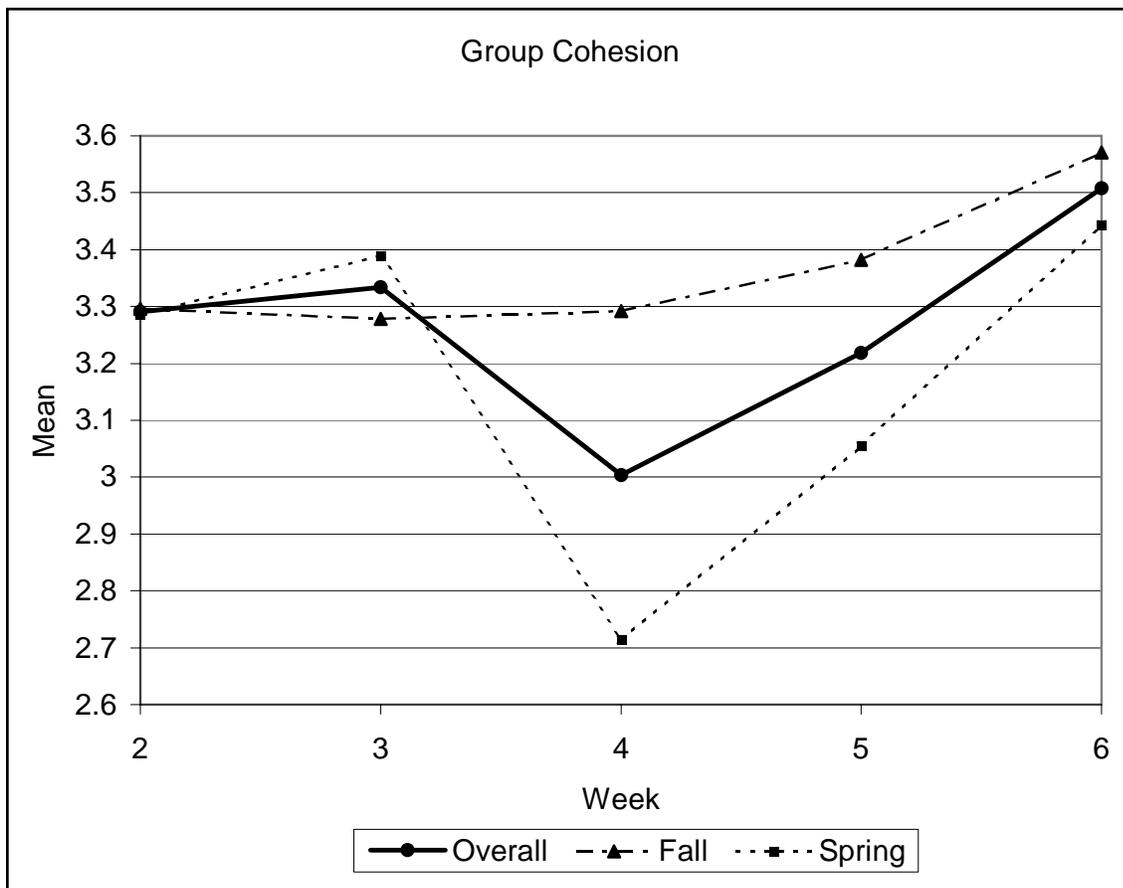


Figure 4.5. Profile plot of TIME and TIME x SESSION for sub-component, group cohesion.

Figure 4.5 shows that there were some changes across the five weeks with a dip occurring in the fourth week. The repeated measures test revealed that the main effect, TIME, was close to significant $F(4,11) = 2.40, p = 0.11$. The lowest level of group cohesion occurred during Week 4 and then rose to a level greater than the beginning level (Week 2 mean: 3.29, Week 6 mean: 3.50). According to the simple contrast tests, none of the subsequent weeks (Week 3 to Week 6) were significantly different from Week 2. However, Weeks 4 and 5 were significantly different from Week 6. Therefore from Week 4 to Week 6, group cohesion significantly increased. The growth curve analysis also provides evidence that this trend shows a significant quadratic pattern $F(1,14) = 6.03, p = 0.03$. While there was an increase from Week 2 to Week 6, simple contrast tests suggested this increase was not significant. However, given the quadratic trend, group cohesion decreased at first, but then significantly increased from Week 4 to Week 6. This may not be a negative finding, and may suggest instead that participants may have at first been reluctant to disclose personal information and share personal experiences but as the weeks went by, they felt more comfortable doing so.

Question 2: Were There Differences Between The Fall And Spring Sessions Across The Five Weeks?

Similar to other analyses of differences, this analysis was in two parts, assessing whether trends were parallel for both groups, and whether sub-component mean scores were the same. Figure 4.5 shows some dissimilarity between the group cohesion trend of the Fall and Spring sessions. The Fall session showed steady small increases in group cohesion across the five weeks, while the Spring session showed more of the quadratic pattern in group cohesion. However, despite this discrepancy between the Fall and Spring sessions, the interaction effect TIME x SESSION was not significant $F(4,11) = 1.04, p = 0.43$. Though not significant, the

dissimilarity between the Fall and Spring sessions may suggest two different processes of group cohesion taking place. In the case of the Fall group, members felt closer to each other as the weeks progressed, whereas in the case of the Spring group, members were initially reluctant to get close to other members but eventually over time felt closer. These different processes may have some effect on the program effectiveness results.

For the second part, the between subjects test revealed that there were no significant differences between the Fall and Spring sessions for group cohesion, $F(1,14) = 0.97, p = 0.34$. Therefore the levels of group cohesion reported across the five weeks were, on average, similar to each other.

Effectiveness of the Facilitator

The final sub-component for program performance was geared towards assessing the effectiveness of the facilitator. There was only one item for this sub-component. The expectation for this sub-component was that the scores remain high across the five weeks, suggesting that the facilitator was highly effective in conducting weekly meetings for all five weeks. Fluctuations in facilitator effectiveness may provide a clue to variations in other program monitoring sub-components. For example, low facilitator effectiveness may help explain low scores of usefulness of social skills, or lack of relevance of topics. On the flip side, if scores do not connect in this way, it may suggest that poor scores of other sub-components may be due to something other than the facilitator.

Question 1: Were The Mean And Mode Scores Across Sub-Component Items High Across The Five Weeks?

The mean (3.35) and mode (4) for the item in this sub-component were relatively high. The response, ‘strongly agreed’ was the most frequent response given when asked about the effectiveness of the facilitator.

Question 2: Were There Variations In Sub-Component Scores Across The Five Weeks?

The repeated measures MANOVA was used to answer this question. Figure 4.6 displays any fluctuations in rating of the effectiveness of the facilitator using a profile plot across the five weeks.

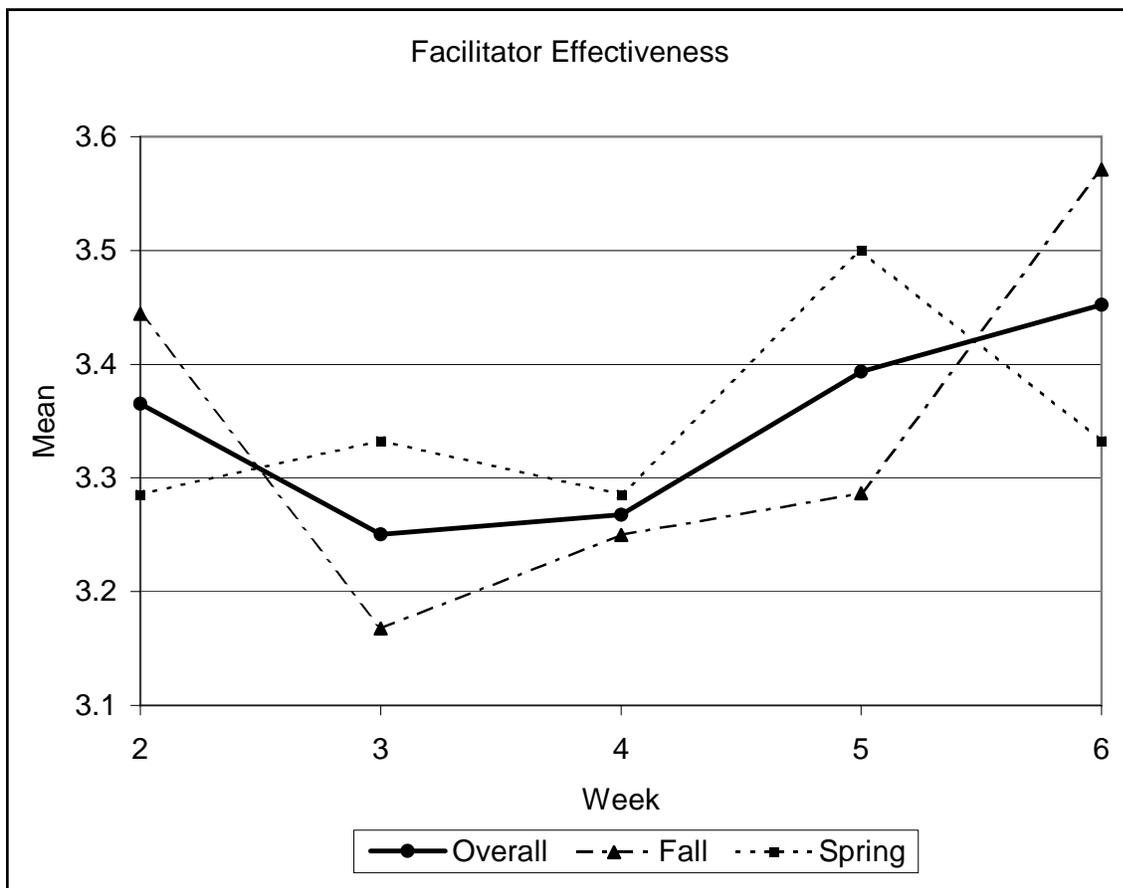


Figure 4.6. Profile plot of TIME and TIME x SESSION for sub-component, effectiveness of the facilitator.

Though there appeared to be some differences across the weeks for the effectiveness of the facilitator, these fluctuations were relatively small (varying from about 3.2 to 3.5). The repeated measures MANOVA indicated that these fluctuations were not significant, with the main factor, TIME, being not significant, $F(4,11) = 1.39, p = 0.34$. These findings along with the findings for Question 1, suggested that rating for facilitator effectiveness was high and stable across the five weeks.

Question 3: Were There Differences Between The Fall And Spring Sessions Across The Five Weeks?

Again, this question had two parts. The results for the first part, tested whether both sessions showed parallel trends and found that the sessions were parallel, with the interaction, TIME x SESSION, being not significant $F(4,11) = 0.49, p = 0.15$. The second part, which tested whether the mean sub-component scores are different between sessions, utilizes the between subjects test. The between subjects test was not significant, $F(1,14) = 0.01, p = 0.99$ and suggested that both sessions rated the facilitator similarly across the five weeks. These results are encouraging because they indicated that there were not differences in facilitator effectiveness for either session for any of the weeks. It may also have the implication that low scores in other sub-components may be due to other factors, such as group characteristics.

Conclusion For Program Performance

The program performance results revealed that scores were high across the five weeks. For the most part, the mean and mode scores for items in sub-components of program performance were relatively high ranging between 3 (agree) to 4 (strongly agree). The lowest scores were for items in relevance of topic. On average therefore, participants would probably agree or strongly agree that the program performed well.

For some sub-components though, these scores did not show stability over the five weeks. In the case of relevance of topic, it was encouraging because it showed a significant increase over time. However, for usefulness of social skills and satisfaction, there was instead a quadratic pattern, with scores dipping towards the middle of the program and then increasing towards the end. Only for the effectiveness of facilitator, did the scores remain stable across the five weeks. With regards to group cohesion, where an increase was expected across the five weeks, there was also the same quadratic pattern found for other sub-components. Some explanations have been provided for these results, including the idea that this pattern may represent a more therapeutic pattern of change, or that participants may have been reluctant at first to fully engage in the program. It may also be an indication that some aspects of the program need improving.

Finally, there were questions concerning whether the scores were different for the Fall and Spring sessions. In several cases they were different: Fall and Spring sessions showed nonparallel trends for relevance of topic, and usefulness of social skills, and had significant mean differences for usefulness of social skills. Though non-significant, the Fall and Spring sessions did show nonparallel trends for group cohesion.

Though there were some fluctuations from week to week of some of the sub-components, the 'high' mean and modal scores of sub-component items suggested that the program performed at an acceptable level.

Individuals' Level Of Participation

As the name suggests, this component was designed to measure participants' level of participation across the five weeks to assess how engaged they were in the program. This component had two items. These items assessed whether participants put in 1. the same amount

of time and 2. the same amount of effort into the program as they usually do. In addition to these items, the rate of attendance at weekly meetings was also an indicator of level of participation and although not assessed using the weekly questionnaire, is reported upon in this section. For this component it was expected that attendance would be high, and that participants would continue to put in the same amount of time and effort into the program. Poor attendance and low levels of investment of time and effort may indicate that the program was not interesting enough to keep participants engaged and/or provide some links with the results reported in Program Effectiveness (e.g., did participants fail to show significant reductions in loneliness because they did not invest enough time/effort?). Fluctuations from week to week may be an indication that the program may have been too demanding some weeks. Therefore for this component, there are four important areas of investigation: 1. What was the rate of attendance of participants? 2. Were the mean and mode scores across component items high across the five weeks? 3. Were there variations in component scores across the five weeks? 4. Were there differences between the Fall and Spring sessions across the five weeks?

Question 1: What Was The Rate Of Attendance Of Participants?

Out of the seven weekly meetings of the program, on average participants missed one meeting (mean = 0.81, mode = 1). Overall, 6 participants did not miss any meetings, seven participants missed one meeting, and 3 participants missed two meetings of the program. The high attendance rate suggested that the participants were committed to the program.

Question 2. Were The Mean And Mode Scores Across Component Items High Across The Five Weeks?

The mean scores for these component items were relative low (compared to program performance means). The means were 2.57 and 2.77 for ‘the amount of time’ and ‘the amount of

effort' respectively on a scale from 0 (strongly disagree) to 4 (strongly agree). For the amount of time item, there was a discrepancy between the mean (2.57) and mode (4) values, with participants most frequently 'strongly agreeing' that they put in the same amount of time as they usually do. However, the mode score for amount of effort (3) was closer to the mean value (2.77). These results indicate that participants may have been fluctuating in the amount of time and effort they used.

Question 3. Were There Variations In Component Scores Across The Five Weeks?

To answer this question, the repeated measures MANOVA described in the analysis plan was used. The two items for this component were used in the ITEMS factor. Figure 4.7 shows the profile plots across the five weeks and displays fluctuations that occurred from week to week.

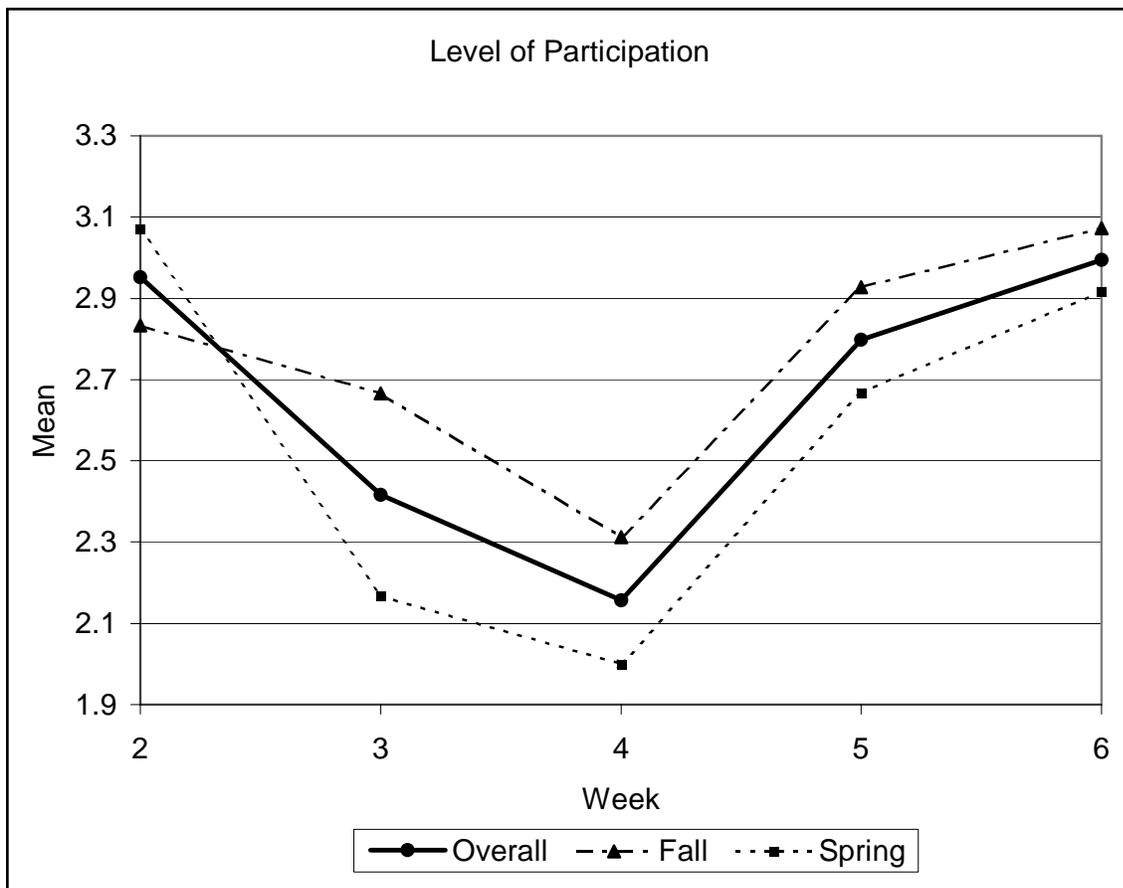


Figure 4.7. Profile plot of TIME and TIME x SESSION for component, Level of Participation.

Figure 4.7 shows a definite U-shaped curve in amount of time and effort that participants usually put into the program indicating fluctuations from week to week in the program. The repeated measures MANOVA found that there were fluctuations with the main effect, TIME, being significant $F(4,11) = 2.92, p = 0.07$. The lowest point in the curve occurred at Week 4, and the beginning and end points were approximately the same (2.95 for Week 2, and 3.00 for Week 6). Simple contrast tests showed there was a significant difference in the level of participation in Weeks 3 and 4 when compared with Week 2 and Week 6. Growth curve analysis also suggested that there was a significant quadratic trend, $F(1,14) = 10.67, p < 0.01$. These results suggested that the level of participation significantly dropped during Weeks 3 and 4 of the program and then significantly increased towards the end of the program. This result was interesting especially when considering the similar pattern found for the sub-component, satisfaction. While the direction of influence was unclear, satisfaction and the level of participation may have been influencing each other causing a drop in both.

Question 4. Were There Differences Between The Fall And Spring Sessions Across The Five Weeks?

As before, this question has two parts, looking at the parallel trends and the differences between mean component scores between the Fall and Spring sessions. Figure 4.7 shows that the trends for the Fall and Spring sessions were relatively parallel. The repeated measures MANOVA found a parallel trend with interaction effect TIME x SESSION being not significant, $F(4,11) = 0.58, p = 0.68$. Also, with regards to mean differences between component scores, the between subjects test showed that the difference between the Fall and Spring session was not significant for Level of Participation, $F(1,14) = 0.38, p = 0.55$.

Conclusion For Level Of Participation

The evidence suggested that participants' Level of Participation decreased towards the middle of the program and then increased towards the end of the program. This finding was consistent for both sessions (Fall and Spring) and may imply that either a program influence or an external influence (or both) caused these fluctuations in participation to occur. It also suggested that this may have had an effect on other parts of the program, such as satisfaction.

Week To Week Emotional States

This final component assessed the emotional states of participants from Weeks 2 to 6, and provided an indication of whether the program was having an impact on participants. The component consisted of two sub-components, the degree to which participants reported feeling less lonely or less sad than the previous week (reduced feelings of loneliness and sadness), and the degree of confidence in meeting new people and satisfaction with themselves (feelings of confidence and satisfaction with self).

Reduced Feelings Of Loneliness And Sadness

This sub-component examined whether participants experienced reductions in feelings of loneliness and sadness from week to week. It had two items from the weekly questionnaire: the degrees to which participants experienced 1. reduced feelings of loneliness and 2. reduced feelings of sadness. The expectation for these sub-component scores was that they increased from week to week, suggesting that as the program progressed, participants were feeling less lonely and less sad. A lack of increase in these sub-component scores may indicate that the program was having no effect in reducing their feelings of loneliness and sadness. Therefore, the main areas of investigation for this sub-component were: 1. Were there variations in sub-

component scores across the five weeks and if there were variations, did they showing a positive trend? 2. Were these differences the same for the Fall and Spring sessions?

Question 1: Were There Variations In Sub-Component Scores Across The Five Weeks And If There Were Variations, Did They Showing A Positive Trend?

The repeated measures MANOVA was utilized to answer this question, with the two items of this sub-component used in the ITEMS factor. Figure 4.8 shows the profile plots across the five weeks to illustrate the any changes over time.

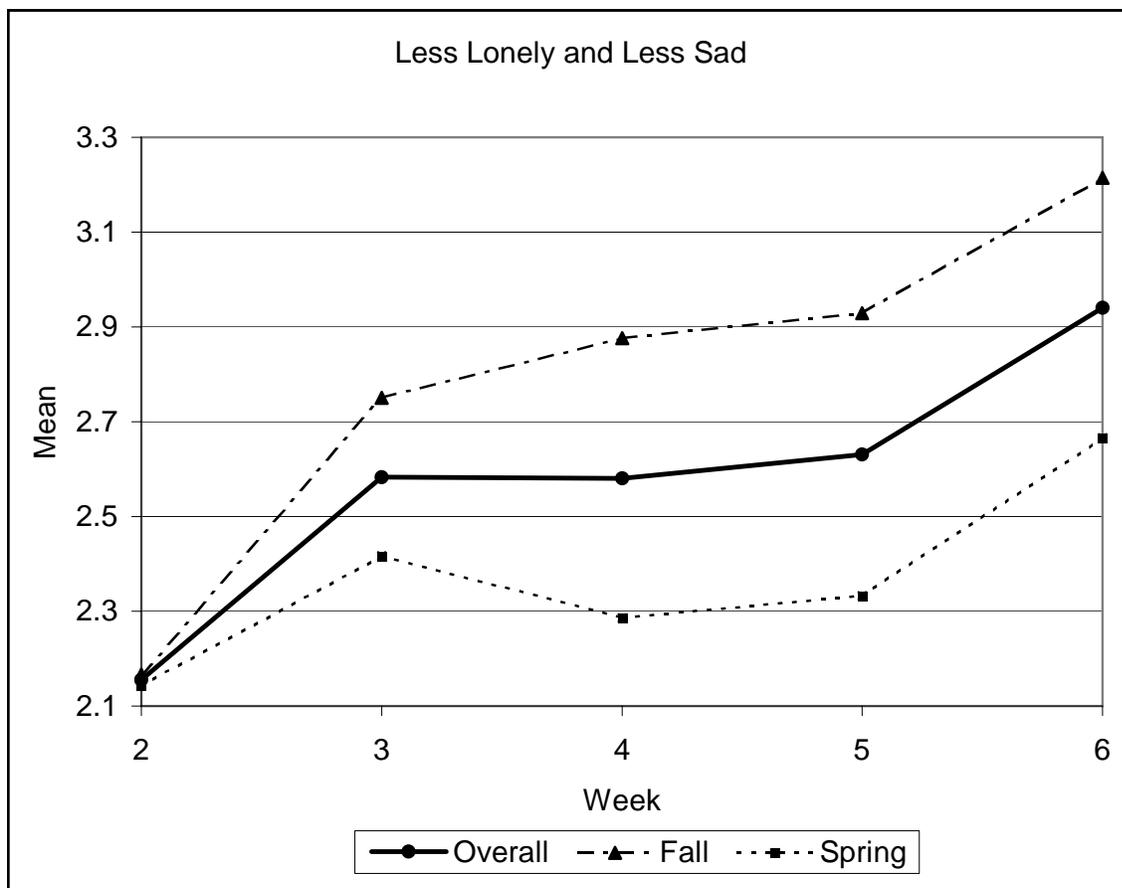


Figure 4.8. Profile plot of TIME and TIME x SESSION for sub-component, reduced feelings of loneliness and sadness.

Figure 4.8 suggested that participants increasingly agreed that they were experiencing a reduction of feelings of loneliness and sadness. However, the repeated measures test did not find

a significant main effect for TIME, $F(4,11) = 1.06, p = 0.42$. Despite this lack of significance though, Figure 4.8 does at least show the trend that participants were experiencing greater reductions in loneliness and sadness from week to week.

Question 2. Were These Differences The Same For The Fall And Spring Sessions?

There were two parts to this question: part one investigated whether the trends between the two sessions were parallel, and part two examined if the mean sub-component scores were different. For part one, using the repeated measure MANOVA, the interaction, TIME x SESSION, did not show significance, $F(4,11) = 0.34, p = 0.84$ and suggested that the trends for both sessions were parallel. Also, for part 2, the between subjects test was not significant, $F(1,14) = 2.56, p = 0.13$, which also suggested that the mean for both sessions on this sub-component was the same. However, as Figure 4.8 displays, while both sessions started at approximately the same level at Week 2, the Fall session reported greater reductions in feelings of loneliness and sadness at Week 6 than did the Spring session.

Feelings Of Confidence And Satisfaction With Self

This sub-component had two items that looked at 1. the increase in feelings of confidence in being able to meet new people and 2. participants' satisfaction with themselves. Similar to the previous sub-component, it was expected that scores for this sub-component would increase from week to week, as the program made a greater impact on the participant. The increases would suggest that the program was having an impact. The two main areas of investigation were: 1. Were there variations in sub-component scores across the five weeks and if there were variations, did they showing a positive trend? and 2. Were these differences the same for the Fall and Spring sessions?

Question 1. Were There Variations In Sub-Component Scores Across The Five Weeks And If There Were Variations, Did They Showing A Positive Trend?

The repeated measures MANOVA was used to answer this question, with the two items of this sub-component used as the ITEMS factor. Figure 4.9 is the profile plot for this sub-component showing any changes that took occurred over the five weeks.



Figure 4.9. Profile plot of TIME and TIME x SESSION for sub-component, feelings of confidence and satisfaction with self.

Figure 4.9 shows that while there were some fluctuations from week to week, it appeared that overall, scores for this sub-component increased from Week 2 to Week 6. The repeated measures MANOVA however, did not find significant fluctuations from week to week, with the main effect, TIME, being not significant $F(4,11) = 1.94, p = 0.17$. On the other hand, simple

contrast tests showed significant increases from Week 2, to Weeks 3, 5 and 6. Growth curve analysis suggested a significant linear trend from Week 2 to Week 6, $F(1,14) = 7.15, p = 0.02$. Though the TIME factor was not significant, simple contrast tests and growth curve analysis indicate that over time participants may have felt more confident about meeting new people and greater satisfaction with themselves.

Question 2. Were These Differences Are The Same For The Fall And Spring Sessions?

Similar to previous sub-components, this question had two parts. With regards to part one, investigating whether both Fall and Spring sessions showed parallel trends, the interaction effect, TIME x SESSION, for the repeated measures MANOVA was not significant, $F(4,11) = 1.47, p = 0.28$. This suggested that the trends for the Fall and Spring sessions were parallel. For part 2, the mean sub-component scores for the Fall and Spring sessions, the between subjects test revealed that there were no significant differences between the Fall and Spring sessions, $F(1,14) = 0.20, p = 0.66$.

Conclusion For Week To Week Emotional States

Although the TIME factor was not significant for week to week emotional states sub-components, the trends show that participants from both sessions were reporting the same positive changes. Both the Fall and Spring sessions reported feeling less lonely and sad and also having increased confidence in meeting people and satisfaction with themselves.

Chapter Conclusion

The main question for program monitoring asked whether the program was successful in functioning as intended. Results across the three main components of program monitoring suggested that on a whole that the program functioned at a sufficient level. Program performance results showed that the majority of sub-components showed 'high' scores for both

the Fall and Spring sessions. For Individuals' Level of Participation, the results showed high attendance at weekly meetings, however, there were fluctuations in the amount of time and effort participants invested into the program. There was a dip in the middle of the program, which may suggest some disengagement; however, participants returned to their original levels of participation by the end of the program. It was also suggested that there may be some relationship between the decreases in participation and satisfaction with the program. Finally, though not significant, the results from the week to week emotional states component suggested there were reductions in feelings of loneliness and sadness and increases in confidence in meeting new people and satisfaction with self for both groups.

CHAPTER 5: DISCUSSION AND CONCLUSION

The purpose of this project was to create, implement, and evaluate a loneliness intervention program for college students. The results provided evidence that the intervention was successful in helping lonely college students significantly reduce their levels of loneliness and that this reduction was sustained over a 4 to 5 month period. The intervention program, called the LUV (Lonely? Unburdening your Vulnerability) program, was a seven-week psycho-educational intervention. The main program activities consisted of program modules, weekly discussion meetings, assignments, and journal writing. These program activities were aimed at improving attachment styles, increasing social skills, and enhancing coping. The evaluation of the program had two main sections: program effectiveness (i.e., changes in participants from pretest to follow-up posttest) and program monitoring (i.e., did the program perform as intended).

Program Effectiveness Results

The program effectiveness results suggested that the program worked: it significantly reduced levels of loneliness in participants from pretest to posttest, and sustained reduced levels of loneliness at the follow-up posttest. At the end of the program, 12 out of the 16 participants reported levels of loneliness that were at lower levels than when they started the program. Given the small sample sizes of the experimental group and the matched control group, this significant reduction suggested that effects for the experimental group were relatively large.

The program aimed at reducing loneliness by focusing on three problem areas: attachment styles (cognition), social skills, and coping. Previous researchers have highlighted these three problem areas as areas that should be focused on by loneliness intervention programs (e.g. Murphy & Kupshik, 1992; Rook, 1984a; Rook & Peplau, 1982; Young, 1982). The results

suggested that the program was successful in addressing at least two of these three problem areas. First, there were improvements in attachment styles, with higher levels of the positive attachment style, confidence and lower levels of two negative attachment styles, relationships as secondary and preoccupation at the end of the program. In addition, participants of the program reported levels of social skills at the end of the program that were significantly greater than their levels at the beginning of the program. These changes in attachment styles and social skills were sustained 4 to 5 months after the program had ended. Coping, however, showed a less clear and substantial change in participants of the program. A decrease was detected in ruminative coping immediately after completion of the program, but the decrease was not sustained at the follow-up. Passive-avoidant coping showed significant decreases at the posttest and sustained decreases at the follow-up posttest, but this was true only of the Fall session. There were also no significant changes found for positive coping styles.

The program theory suggested that these three problem areas may cause sustained feelings of loneliness and resolving these problems may then lead to a reduction in loneliness. To help address these problem areas, the program was constructed to work in a two step process: first, by helping participants realize the different ways they think and behave that may be isolating them from others and causing them to feel lonely, and second, by helping them address their problem areas. Also, because the program was done in a group environment, participants could both give and receive support from others in helping them to address their problem areas. This is the proposed mediation process whereby program activities address these problem areas, which in turn help to reduce participants' level of loneliness. However, the small sample size limited my ability to do a formal test of mediation of these variables with loneliness. A review of the weekly meeting discussions, however, suggested that this might have been the mediation

process that occurred. A couple of example quotations are below showing mediation processes for each problem area: attachment style, social skills, and coping.

This first example is from John⁶, who took part in the Spring program. John did not seem to be your stereotypical lonely person, he was very eloquent, outspoken, and empathic. But during the first few meetings with John, it became clear that he seemed to have a preoccupied attachment style: he was overly concerned about getting into close relationships and felt betrayed that his friends did not reciprocate in his relationships with them. He felt like he was the one doing all the work in the relationship and his friends were not doing anything to maintain the friendship. During the middle of the program he realized that perhaps because he was trying so hard to make his friendships work, it was having the opposite effect. Consequently he tried to not work so hard to make his friendships work. Towards the end of the program, John commented:

I don't know if I feel lonely the way I used to, I don't feel as though I am isolated the way I was before...maybe just the mentality of not attempting to accomplish anything is sort of, you know, ironically working, like by not trying, things happen. (John, spring session, week 6)

Here we can see the mediation process occurring: first he realized what his problem area was, that is, he was preoccupied about getting into and maintaining close relationships. Second, he worked on the problem by not trying so hard, which led to the end result that he reported feeling less lonely.

This second example concerns Jason who reported social skills problems, for example, how to initiate conversations and how to keep conversations going. Throughout the program we practiced using different listening and communication skills. Very early on Jason decided to use

⁶ All names are pseudonyms

these skills in his daily conversations. Below is a comment from Jason about one situation in his he did try using a new skill and what happened as a result:

I was at a party on Saturday night and I was talking to a lot of different people, so I remembered the open-ended question thing, and I noticed that when I asked one of those questions, like it really got things going, and I thought that was neat. (Jason, fall session, week 3)

Here again we can see the mediation process, in this case, Jason already knew what his problem area was, social skills, but he did not know how to address the problem. The program taught him about different listening and communication skills, which he then worked on by practicing in social situations. In the end, it helped to improve the quality of his interactions.

This final example is from Brandon, who reported problems in coping with loneliness. At one meeting, for example, he disclosed that sometimes he would feel very lonely and pull away from others. It would take him a day or two to emerge from this slump. He identified with the more negative ways of coping with loneliness, ruminating and passive-avoidant coping. In the quote below you can see Brandon acknowledging coping as a problem and trying to find ways to better cope with loneliness:

I was trying to figure out, like uh, if ever I felt lonely, or something like that, find a way to may be feel better a little faster...it's like what usually makes me feel better is just being able to accomplish something for myself, or you know, just talking to people...try and work on that a little faster than, sitting there and not doing anything (Brandon, spring session, week 5).

Again, we can see the mediation process occurring: first, Brandon acknowledging coping as a problem, and second, trying to improve the way he copes with loneliness, which in turn would help him to feel better.

In addition to changes in these mediating variables, it was also hypothesized that there would be changes in other correlates of loneliness as well including depression, alcohol abuse, and self-esteem. Loneliness has been showed to be correlated with these three emotional/behavioral variables (Kupersmidt et al., 1999; Perlman & Landolt, 1999). The results showed that for depression, alcohol abuse, and self-esteem, the experimental group showed significant improvements, with lower levels of depression and alcohol abuse, and higher levels of self-esteem at the end of the program. The results also showed that these improvements were more evident in one out of the two sessions. Overall, these results are encouraging because they suggest that for college students in which loneliness is major problem, participating in this intervention program, may not only help them reduce their levels of loneliness, but may also help them feel less depressed, lower their abuse of alcohol, and increase their self-esteem.

In conclusion, the program effectiveness results did provide evidence that the program worked, showing reductions in loneliness, and also improvements in two problem areas, social skills and attachment styles. There was less evidence to support the hypothesis that there were improvements in coping. There was also evidence that the program had an effect on reducing participants' level of depression and alcohol abuse, and also increasing participants' self-esteem. The mediation process whereby program activities helped to resolve participants' problem areas, which in turn led to reductions in loneliness could not formally be tested. Participants' comments at the weekly meetings did suggest that this might have been the mediation process

occurring. Jason neatly sums up the mediation process and the effect of having others in the group who feel lonely:

Like you kind of explained a few things, like you can kind of look back and think, oh, so may be that's why I'm this way or I have this problem, or something. And since you know like, why you are having it you can do whatever.... I definitely feel a little more confidence in that like...everyone really has loneliness at some level, and even really cool people. (Jason, fall session, week 7)

Program Monitoring Results

The program monitoring results were geared towards assessing whether the program functioned as intended. It looked at the levels of functioning of different aspects of the program and how these levels varied across five weeks of the program (weeks 2 to 6). These results were important for two reasons: first, it provides some idea of what parts of the program worked well and what parts of the program need improving; second, it provides some complementary data for the program effectiveness results. The program effectiveness mediation process assumes, for example, that the modules were relevant and therefore helped participants become aware of their problem areas. Program monitoring directly asked participants if indeed these modules were relevant. Being able to confirm that the program worked as intended provides some further support to the program effectiveness results. So, for example, we can know if participants gained insight into understanding their loneliness, if the social skills were useful, or if they thought they were feeling less lonely as the program progressed.

Some patterns across the five weeks suggested that the program functioned as intended. For example, group members reported greater feelings of closeness to the group at the end of the program than at the beginning of the program, participants reported consistently high levels of

facilitator effectiveness across the five weeks, participants reported feeling less lonely and sad and they also reported feeling more confidence in meeting new people and greater satisfaction with themselves from week 2 to week 6.

Results for the program monitoring subcomponent, relevance of topic, provided some mixed results with regards to whether program functioned as intended. This subcomponent included items such as the relevance of the module and how much new insight participants gained in understanding themselves. Relevance of topic showed a steady linear increase, instead of a consistently high level, across the five weeks. While unexpected, this pattern suggested a different plausible interpretation that the curriculum addressed progressively more relevant, pertinent topics. So for example week 2 dealt with what loneliness feels like vs. weeks 5 and 6, which dealt with attachment styles and relationship development and maintenance. Participants also commented in the meetings that the modules were relevant and they gained a better understanding of themselves. Two illustrative quotes highlight this point:

I definitely think that I can see myself doing some of the things in these modules...I kind of see myself identifying with things that I do that I shouldn't do, so I think that's good because at least I can, kind of, start to try to work on some of them. (Sarah, fall session, week 7)

I think most of the modules were pretty good. You find things in it, that really, I don't know, pertain to my life.... I think I was able to learn a lot about myself, and to learn about, what to do with trying to help. (Tony, spring session, week 7)

These two quotes by Sarah and Tony showed how the modules helped them to better understand themselves, especially in terms of why they may feel lonely, which in turn provided a starting point about what to do about it. The quotes suggest a connection between program effectiveness

and program monitoring results: because the modules were relevant, significant changes occurred for program effectiveness.

Other aspects of the program did not appear to conform to initial expectations. These aspects are: usefulness of social skills, satisfaction, and individual's level of participation. These three aspects of the program showed a significant U-shaped quadratic pattern from Week 2 to Week 6. It was initially expected that, usefulness of social skills and satisfaction should be relatively constant or increase across the five weeks, and individual's level of participation should remain relatively constant from week to week. To further understand why these patterns were occurring I looked at comments participants made during the meetings. Reviewing participants' comments suggested reasons for the patterns in usefulness of social skills and individual's level of participation.

In explaining the U-shaped pattern for usefulness of social skills, it appears that initially participants were having trouble remembering to use the listening and communication skills they learned at the meetings in their ordinary conversations. Over time and with practice, the skills became easier to use. Two quotes below illustrate this point, in both cases, Darryl and Larry mentioned the difficulty in trying to implement the social skills they learned into their ordinary conversations and the need they felt to practice these skills further:

Yeah, I think that it is really gradual to start to make those things [listening skills] a natural part of your conversations, I think I'm more at a stage of monitoring myself and trying to figure out what the problem is and hopefully later, may be a solution will come.
(Darryl, fall session, week 6)

I don't think it [listening skills] worked well because I'm not used to talking like that, so it was kind of awkward, I think I probably just need some practice with that as well, if I

can use it.... When I'm talking to people it's hard for me to just think like, what was on the list, so I guess it's just hard for me to remember when I'm actually talking to people. (Larry, fall session, week 3).

This difficulty in using social skills may account for the U-shaped curve. I would suggest that at first, participants practiced these skills during the weekly discussions and thought they were useful. However, when they were encouraged to use these skills in their ordinary conversations outside of the group, some participants were having trouble using them either because they forgot or felt awkward doing it. At this point, participants may have thought the skills as less useful. Then, over time and with practice, participants felt more comfortable using the skills outside of the group and therefore their usefulness increased again.

It is conceivable that participants' level of satisfaction may have been affected by their initial attempts to practice the social skills outside of the group, and their initial frustrations may have lowered their satisfaction. With the topics/modules increasing in relevance and more practice with different social skills, satisfaction could have increased towards the end of the program. Participants however, did not mention in the meetings changes in satisfaction or reasons why there might be changes, so it is difficult to say for certain why levels of satisfaction showed a similar pattern.

With regards to Individual's Level of Participation, several participants in the Spring session disclosed that they did not put in as much time as they thought they should. These two quotes below illustrate how Brandon and Jerry thought about the amount of time and effort they were putting into the program. Jerry in particular mentioned his feeling that, had he put more time into the program, he might have gotten more out of it:

I can honestly, I mean, this is nothing against you or the program, I honestly, as soon as I walk out of here, don't even think about it until the next Tuesday, really so, I mean, that's like, that's my problem. (Brandon, spring session, week 7)

I think I should have put more into the program as far as, like, outside of the sessions I should have worked harder at applying some of those skills, I mean, I think kind of like Brandon said, I rarely thought about it, I mean I thought about it, but not enough to do anything about it...I felt throughout the semester that I should have been working harder at that, and I imagine I would have felt better about things if I had done that. (Jerry, spring session, week 7)

The quotes also give the impression that participants blamed themselves for not putting more time and effort into the program. There were however, several reasons given at the meetings for putting in less time including: being too busy, the topic/module was not relevant to a participant's situation, or because of the emotional intensity attached to a particular activity (e.g. completing an assignment or practicing a social skill). The last reason (i.e. emotional intensity) I think may help explain the U-shaped pattern for individual's level of participation. In moving towards the middle of the program, participants may have felt reluctant to do some of the activities, but as group cohesion increased and the topics became more relevant, participants may have felt more comfortable to engage in some of these activities. Whatever the reason for reduced levels of participation, participants did acknowledge that reductions in participation may have affected what they got out of the program. This provides an example of how the program not performing as intended (program monitoring) could have affected the changes participants experienced (program effectiveness).

Overall, the program monitoring results suggested that some aspects of the program did perform as intended. Other aspects of the program did not perform as initially expected, such as the case with usefulness of social skills, which showed a U-shaped pattern instead of a constant high level across the five weeks. In such cases where the program did not perform as initially expected, it appeared that the process of change was different from what was originally conceptualized. So, for example, the data suggested that participants were more likely to rate social skills as useful once they had practiced using them over a period of time. When I was creating the program I had not factored in how much practice participants would need before the social skills became useful. These results can serve as a guide if the program is repeated by highlighting the process of change. If, for example, the usefulness of social skills and satisfaction decrease towards the middle of the program, these results highlight this as a normal part of the change process and the facilitator can rest assured that they will increase again towards the end of the program.

The program monitoring results also complemented the program effectiveness results. There was greater support for the assertion that the changes found in the program effectiveness results can be attributed to the program because the program functioned as intended. Participants also suggested that what they got out of the program depended upon how well the program functioned. For example, participants' high ratings of relevance of topic implied that participants were gaining insights about themselves and why they felt lonely, which in turn could explain the improvements that occurred at the posttest. Also participants mentioned that decreases in their levels of time and effort reduced the impact of the program for them.

Limitations and Future Directions

This project had several major limitations, which are important issues to consider for the future directions of this project. One major limitation of this project was the sample size of the experimental group. The limited sample size restricted the evaluation in several ways. Firstly it limited generalizability because it was difficult to say for certain how representative this group of participants is in terms of the general lonely young adult population. Secondly limited sample size also restricted the power of statistical tests. With more cases the evaluation could have been enhanced with mediation to test if changes in the three problem areas (attachment, social skills, and coping) predicted changes in loneliness. Also, having a larger sample size would have allowed for testing individual characteristics, such as gender or ethnicity, to see if these impacted how effective the program was in reducing loneliness.

Another limitation was the attrition of the samples from posttest to follow-up posttest, which limited the ability to create a comparable matched control group at the follow-up posttest that was similar to the matched control at the posttest. As a result of the attrition of both the control and experimental groups, analyses at the follow-up posttest were only between the reduced experimental group and the total control group. Because of this, caution must be taken when interpreting the findings at the follow-up posttest. The missing experimental group members might have adversely affected the results at the follow-up posttest had they participated. Indeed there may have been a selection effect; perhaps only participants who felt that the program had long-lasting effects answered the follow-up posttest questionnaire. It is also unclear how the experimental group compared with a matched control group at the follow-up posttest.

One future direction is to repeat the program several times, which would allow for a greater sample size. The greater sample size would help address some of the limitations related to the small sample size of this present study. In addition, the age range of participants can be diversified to include high-school aged students. It is possible that some of the problems experienced by college students may have started in high school. Implementing the program at that earlier stage may help to correct these problems before they become more resistant to change. It would also be interesting to see whether the program will perform as well with this different age group given their different life experiences (such as greater pressure to “to fit in” or the greater family influence or the different social networks).

The other major limitation is that there was only one facilitator conducting the program. At this point, there is not enough data to conclude how much change in participants can be attributed to elements of the program or to the facilitator. Perhaps it was not the program activities itself that helped create change, but rather the way I conducted the activities, or additional things I may have done that was not part of the official program. At this point it is unclear whether the program would have the same effect if another person conducted it, or what type of training or set of skills the facilitator needs in order to successfully conduct this program. In repeating the program, using different facilitators would therefore enhance the evaluation of the program. Using different facilitators would allow for analyses to determine how much of improvements seen in participants can be attributed to activities of the program vs. the effectiveness of the facilitator.

The majority of participants also commented that they wanted the program to be longer or to have some kind of follow-up after the program ended. One suggestion is to make the program a two-part program, the first part entails the seven-week psycho-educational program

and the second part, a support group for past participants of the program. At the end of the program it was clear that some participants were making more progress than others, and this support group would allow for those improving more slowly to continue to have a forum for helping them with their loneliness. Having a continuous support group may also serve as a useful recruiting tool since members of the support group can encourage others to enroll in the seven-week program when it is offered.

Three results, two from program effectiveness and another from program monitoring, highlighted some weaknesses in the program. Results from program effectiveness revealed less substantial findings for coping and no significant findings for self-disclosure. Results from program monitoring showed participants decreasing in the amount of time and effort they put into the program. I hypothesize that these three findings are a result of another underlying problem area not specifically covered in this program. This problem area is social anxiety. A number of participants revealed in the screening interviews to have social anxiety. Social anxiety may have hindered participants trying to engage in more positive coping behaviors (such as talking to others about their feelings or problems when they feel lonely), disclosing to others, and may have decreased their participation in the program. Addressing this problem area of social anxiety specifically may help to enhance the effectiveness of the program.

The program theory suggested that three problem areas (attachment style/cognition, social skills, and coping) were the causes of sustained loneliness that college students may experience and that by addressing these problem areas, loneliness levels may decrease. While the analyses were unable to conclusively determine whether resolving these problem areas may in turn, lead to a reduction in loneliness, the results did show significant improvements in attachment styles and social skills and also significant reductions in loneliness. The results are

encouraging because it suggested at the very least that the program in its current form is capable of helping college students reduce their level of loneliness.

The results also have important implications for the study and treatment of loneliness. To begin with, whereas therapists and clinicians view loneliness as a secondary problem (Murphy & Kupshik, 1992), this study suggested that loneliness can be a primary problem. In addition, by focusing on loneliness, other 'traditional' problems of individuals can be reduced, including depression, alcohol abuse, and low self-esteem. While this program did not directly address any of these problems, they nevertheless showed a reduction at the end of the intervention. One important implication could be that some individuals who have depression, alcohol, or self-esteem problems, loneliness may be the underlying primary problem and it may be more effective to treat loneliness than to treat these secondary problems of depression or alcohol abuse.

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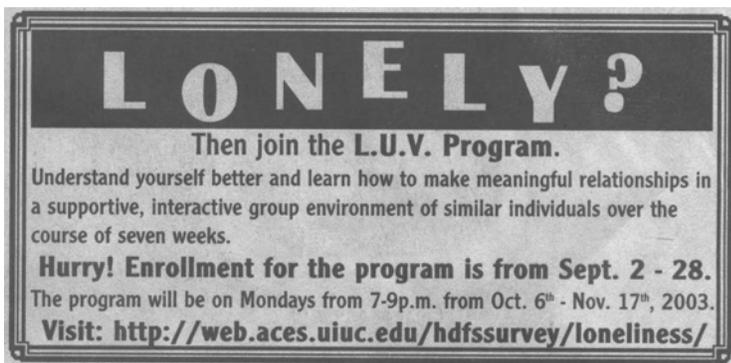
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APPENDIX A: ADVERTISEMENT SAMPLES

Notice Board Flyer:

<u>Do you feel lonely?</u>	Do you feel like you are on the outside looking in?		Do you have difficulties making friends on campus?	
<u>Would you like to change the way you feel?</u>				
Then join the L.U.V. (Lonely: Unburdening your Vulnerability) program. For seven weeks, you will be taken on a journey that will help you understand yourself and teach you how to create meaningful relationships with others.				
<ul style="list-style-type: none">• It's free to all UIUC students 18 and older• You could win \$100 for participating• You get to meet new people and share your experiences with them in a positive supportive atmosphere.		<ul style="list-style-type: none">• Hurry! Enrollment for the program is from Sept. 2 – 28th.• The program will be on Mondays from 7 – 9pm from Oct. 6 – Nov. 17th, 2003• There will also be another session in Spring, 2004		
Visit: http://web.aces.uiuc.edu/hdfssurvey/loneliness/ for more details!				

Newspaper Ad (Taken From the Daily Illini, Friday, September 26, 2003):



L O N E L Y ?

Then join the **L.U.V. Program.**

Understand yourself better and learn how to make meaningful relationships in a supportive, interactive group environment of similar individuals over the course of seven weeks.

Hurry! Enrollment for the program is from Sept. 2 - 28.

The program will be on Mondays from 7-9p.m. from Oct. 6th - Nov. 17th, 2003.

Visit: <http://web.aces.uiuc.edu/hdfssurvey/loneliness/>

APPENDIX C: PARTICIPANT SYLLABUS

LUV PROGRAM: WHAT WE WILL BE DOING.

- Week 1: Introduction to the Group**
- Week 2: The Experience of Loneliness**
What does loneliness feel like? How do we describe loneliness?
- *Listening Skills:* Attending Skills, Using Open and Closed Ended Questions
 - *Communication Skills:* Using “I” statements, focusing on your feelings and behaviors, emotions vs. thoughts
- Week 3: Aloneness vs. Loneliness: How do we cope?**
What are the various ways that we cope with loneliness? Can we be alone and not lonely?
- *Listening Skills:* Reflecting Skills: Learning to Paraphrase and Summarize
 - *Communication Skills:* Non-Verbal Communication
- Week 4: The Public vs. The Private Self**
What kinds of things do we let other people know about us? What things do we keep secret? How does this affect our relationships?
- *Listening Skills:* Encouraging, Reflecting on Feelings
 - *Communication Skills:* Using Self-Disclosure
- Week 5: Conceptions of Self and Other: Automatic Thoughts and Feelings**
What are thoughts and feelings that we have that keep us back from communicating with other people?
- *Listening Skills:* Directive Skills: Interpretation and Confrontation
 - *Communication Skills:* Social Anxiety and Assertiveness
- Week 6: Social Skills: Starting, Sustaining and Ending Relationships**
How do we start, sustain and end relationships? How do we approach strangers? What makes for a good friendship?
- *Listening Skills:* Using the skills we’ve learned
 - *Communication Skills:* Using the skills we’ve learned
- Week 7: Closing Session**