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**“Thinking for Success”: A cognitive restructuring intervention  
for female adolescent athletes**

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**TABLE OF CONTENTS**

<b>ABSTRACT</b>	<b>iv</b>
<b>INTRODUCTION AND LITERATURE REVIEW</b>	<b>1</b>
<b>METHOD</b>	<b>21</b>
<b>RESULTS</b>	<b>32</b>
<b>TABLES OF RESULTS</b>	<b>43</b>
<b>DISCUSSION</b>	<b>55</b>
<b>APPENDIX A. INSTITUTIONAL REVIEW BOARD APPROVAL</b>	<b>72</b>
<b>APPENDIX B. INFORMED CONSENT FORM</b>	<b>73</b>
<b>APPENDIX C. WORKSHOP MATERIALS</b>	<b>74</b>
<b>APPENDIX D. DEPENDENT VARIABLES AND MEASURES</b>	<b>86</b>
<b>APPENDIX E. INTERVENTION TIMELINE</b>	<b>87</b>
<b>APPENDIX F. MEASURES</b>	<b>88</b>
<b>APPENDIX G. MEAN CROSS-COUNTRY TIMES GRAPH</b>	<b>92</b>
<b>REFERENCES</b>	<b>93</b>

## ABSTRACT

Adolescent girls have been shown to be at increased risk for experiencing depression (Atwater, 1996), emotional distress (Covey & Feltz, 1991), lower self-esteem (Bush & Simmons, 1987), and dissatisfied body image (Covey & Feltz, 1991). Female athletes are more likely to attribute successful outcomes to factors independent of themselves (e.g., luck rather than skill) (Hendy & Boyer, 1993). Such cognitive distortions provide an unrealistic framework from which girls evaluate themselves and situations in which they are involved. **“Thinking for Success”** is an intervention designed to provide adolescent girls with active strategies to overcome self-defeating cognitions. The intervention was conducted with a sample of 32 female-adolescent athletes on a cross-country team. Results suggested that the intervention improved participants’ levels of self-efficacy for improving their body image, coping with daily life stress, managing cross-country and physical-fitness abilities, and implementing workshop skills. There was a suggestive, but nonsignificant, trend for lowered trait anxiety. Skills taught throughout the intervention, and level of efficacy for practicing said skills, significantly predicted this decline in trait anxiety. Contrary to expectations, athletic performance was not affected by intervention participation. Power analyses indicated that the current sample size was sufficient to detect only large effects. A larger sample size would have been required to detect small or medium effects.

## INTRODUCTION

Adolescence is typically viewed as a tumultuous period of development. This period may be more stressful for adolescent girls than for boys. There is evidence that adolescent girls report more depression (Atwater, 1996), emotional distress (Covey & Feltz, 1991), and shame (Covey & Feltz, 1991) than do their male counterparts. One factor that may contribute to the distress experienced by adolescent girls is their tendency to engage in overly negative cognitions (Gotlib, Lewinsohn, Peter, Seeley, & Rohde, 1993).

Female adolescents who are involved in athletics may be less susceptible to the negative experiences associated with adolescent development. Sports may foster self-confidence and identity, especially when they are part of a high school girl's adolescent growth experience (Covey & Feltz, 1991). However, female athletes are more likely to attribute successful outcomes to uncontrollable, external factors (e.g., luck) rather than to controllable or stable factors (e.g., skills) (Hendy & Boyer, 1993). These attributions can undermine self-confidence. Thus, negative or unrealistic cognitions also have implications for the female adolescent athlete.

**"Thinking for Success"** is an intervention designed to teach female adolescent athletes to correct their self-defeating cognitions, thereby learning to think in a more effective, realistic, and positive manner. This program was intended to improve athletic performance as well as to enhance psychological variables that are affected by cognitions, such as depression, anxiety, and self-esteem.

To provide background for this study, this paper will first explore the nature of the adolescent experience, particularly that of the female adolescent. This discussion will be followed by a brief overview of cognitive theories of depression, which were the guiding



framework for **“Thinking for Success.”** Finally, a summary of cognitive interventions that have been utilized with adolescents and athletes will be provided.

### **The Adolescent Experience**

#### **Characteristics**

Adolescence is a time of rapid physical and psychosocial change (Kurdek, 1987). While adolescents are undergoing internal changes (e.g., physical, psychological, biological) that can be stressful and require adjustment and adaptation (Berzonsky, 1982), they simultaneously experience external stressors and changes that require additional adjustment and adaptation (Groer, Thomas, & Shoffner, 1992).

Stressful life events that are typical in adolescence include conflict with parents and/or siblings; making new friends; moving to a large, less personal school; changes in appearance; dissatisfaction with body image; dating struggles; and making decisions about behaviors such as smoking, drinking, and sexual intercourse (Brooks-Gunn, 1991). Unfortunately, some adolescents experience more severe life changes, such as the death of a friend or relative, pregnancy, abortion, or drug use (Compas, Davis, & Forsythe, 1985; Vaux & Ruggiero, 1983). Thus, it may come as no surprise that the adolescent’s emotional field is often characterized by intense, negative, and labile moods (Brooks-Gunn, 1991).

#### **Stress**

Stress has been characterized as a relationship between a person and an environment which is appraised as taxing, or exceeding one’s resources and endangering well-being (Lazarus & Folkman, 1984). Frequent stress is characteristic of adolescence, since many of the events occurring in the lives of adolescents are novel, perhaps threatening, and (to the adolescent) important (Brooks-Gunn, 1991).

For both males and females, the highest risk for first onset of a major depression occurs between the ages of 15 and 19 (Burke, Burke, Regier, & Rae, 1990). For depressed children, prevalence of symptoms markedly increase from childhood to adolescence (Marcotte, 1997). It has been proposed that both social events and hormonal factors contribute to the increases in depressive symptoms during adolescence (Brooks-Gunn, 1991).

Higher rates of depressive symptoms have been reported among adolescent girls than among boys (Kandel & Davies, 1982). As many as 25 to 40% of girls report having depressed mood at some time during adolescence, whereas 20 to 35% of boys report experiencing depressed mood (Peterson, Compas, Brooks-Gunn, Stemmler, Ey, & Grant, 1993). Furthermore, elevated rates of depression in girls persist into adulthood (Kandel & Davies, 1986). Although adolescence in general is a stressful period, it appears that girls are at increased risk for suffering from depression during this time.

### Relationships with Parents

Fortunately, supportive parental relationships can protect some adolescents from experiencing significant distress. Although parents can serve as a buffer against stress, the lack of a satisfying parental relationship can induce additional stress. Adolescents whose parents are perceived as warm and supportive, support adolescent self-esteem and encourage the exploration of competencies are more capable of dealing with stress than are those whose parents are not as supportive or encouraging (Shulman, 1993). Unfortunately, time spent with parents, emotional closeness, and perceptions of parental relationships as positive all decrease from early to middle adolescence (Csikszentmihalyi & Larson, 1984; Hill, 1988; Montemayor & Hanson, 1985; Steinberg, 1987; Youniss, 1985). Therefore, the quality of the

adolescent's relationship with her or his parents may either serve as a buffer to, or as a contributing factor in, her or his level of subjective stress.

### Body Image

While adolescence may be stressful regardless of one's gender, it seems that adolescence can be a more difficult life stage for girls than boys. Not only do adolescent girls report more depression (Atwater, 1996), more emotional distress (Covey & Feltz, 1991), and lower self-esteem (Bush & Simmons, 1987) compared to their male counterparts, they are also more concerned with their body image. Research suggests that women tend to evaluate their self-worth in terms of their appearance (Costello & Stone, 1994). Appearance-related issues are of greater concern for girls than for boys (Groer et al., 1992). Unfortunately, girls' estimates of their appearance are often unrealistically negative (Renzetti & Curran, 1989). Therefore, it is not uncommon for young women to report more shame and less satisfaction about their bodies and the physical changes of adolescence than do adolescent boys (Covey & Feltz, 1991). An unrealistically negative picture of one's body can contribute to decreased self-confidence. Such a loss in confidence can leave a young woman with feelings of depression (Kaplan, 1997).

### Life Events

The experience of adolescent girls is quite different from that of adolescent boys. Females experience more life events during this period of development than do adolescent males (Groer et al., 1992). Types of life events reported by girls tend to be more relational and interpersonal in nature (e.g., to fulfill needs for love, belonging, and esteem) (Gnagey, 1980). Adolescent girls also report high frequency and intensity of health problems (Benedict, Lundeen, & Morr, 1981; Compas et al., 1985; Newcombe, Huba, & Bentler,

1981). Thus, the experience of adolescent girls seems to be markedly different, and perhaps more stressful, than that of boys.

### Coping

Finally, coping is a central component of adolescent psychosocial competence, regardless of the adolescent's gender (Tyler, 1978). However, girls tend to channel more energy than boys into coping strategies of "dubious value" (Frydenberg & Lewis, 1993). For example, wishful thinking, worry, keeping to one's self, and self-blame are relatively non-productive coping strategies that are used more by females than by males (Frydenberg & Lewis, 1993). Maladaptive coping has been associated with low self-esteem in adolescent girls (Fryer, Waller, & Kroese, 1997). Thus, girls appear to be especially in need of more productive, potentially less detrimental, coping strategies.

## Cognitive Theories of Depression

### Overview

A cognitive approach to mental health posits that it is not an event that causes one's emotional reactions, but rather the way one *thinks* about the event that creates one's reaction to the situation (Beck, 1976; Ellis, 1962). Specifically, distorted cognitive schemas are the precursors to the experience of negative affect and subsequent behavioral responses.

Inaccurate or distorted cognitive schemas can have a marked impact upon how information is processed and, in turn, upon how the individual thinks, feels, and behaves (Spence, 1994). Specific theories regarding the etiology of depression have been proposed that follow this cognitive approach. Several of these theories will be briefly outlined below.

### Cognitive Theories of Depression

Beck's early work focused on the role of maladaptive thoughts about the self, others, and the future in the maintenance of depression (Spence, 1994). According to Beck (1976), depressed persons make systematic errors in thinking, which serve to generate negative affect. The characteristics of depression can be viewed as expressions of an underlying shift in the person's cognitive organization (Beck, 1976). Because of the dominance of certain cognitive schemas, depressed individuals tend to regard themselves, their experiences, and their respective futures in a negative way.

In Beck's (1976) view, those who suffer from depression believe that they are inferior, inept, socially undesirable and/or lacking in worth. They expect the outcome of any activity they undertake to be negative, and they expect their future to be deficient in satisfactions or achievements (Beck, 1976). Such a cognitive style directly contributes to other symptoms of depression, such as sadness, passivity, self-blame, loss of pleasure, and suicidality (Beck, 1976).

In terms of treatment, the underlying attitude must be ultimately changed if depression is to be influenced (Beck, 1976). The goal of treatment, therefore, is cognitive modification. Cognitive restructuring assists depressed individuals in making explicit the assumptions underlying their depression, and guides them in probing, challenging, and testing these assumptions. Improvement in depressive symptoms is thus related to opening the cognitive system to new information and to different points of view (Beck, 1976).

Similar to Beck's (1976) conceptualization of depression, Rehm (1977) proposed that depression results from distortions in one's thought processes. Rehm's (1977) model focuses on the role of self-control in the etiology of depression. Self-control consists of two

cognitively mediated processes-- self-monitoring and self-evaluation-- both of which may independently or concurrently influence the subsequent manifestation of depressive symptoms.

First, self-monitoring involves observations of one's own behavior. Depressed individuals tend to selectively attend to negative events that follow their behavior to the relative exclusion of positive events (Rehm, 1977). Second, self-evaluation refers to a comparison between an estimate of performance and an internal criterion or standard (Rehm, 1977). Depressed persons tend to set stringent criteria for self-evaluation. Criteria may be stringent in the sense of a high threshold requiring great quantitative or qualitative excellence for self-approval (Rehm, 1977). Criteria may also be stringent in that persons generalize failure to an entire class of behavior from one instance of failure.

According to Rehm's (1977) model, modifying the depressed persons' distortions of their own behavior is the optimal mode of treatment. Such cognitive-change techniques may include encouraging individuals to increase the self-monitoring of positive events and/or to make self-evaluative criteria more accurate, and thereby less stringent.

Based on his research with animals that were placed in uncontrollable aversive situations, Seligman (1972) formulated a learned helplessness model of depression. He hypothesized that when people experience situations in which they have little control, they develop a pervasive belief in their own helplessness. This perception of helplessness leads to the passivity, fatalism, and sad affect of depression.

Building on Seligman's (1972) helplessness theory, Abramson, Seligman, & Teasdale (1978) have suggested an attributional approach to the etiology of depression, the reformulated learned helplessness model. Such an approach posits that some cases of

depression reflect a pervasive feeling of helplessness that one perceives in many situations. Depression results when highly desired outcomes are believed improbable and/or highly aversive outcomes are believed probable, and the individual expects that no response in his or her repertoire will change their likelihood (Abramson et al., 1978). Intensity of depressed affect increases with the desirability of the unobtainable outcome or with the aversiveness of the unavoidable outcome, as well as with the strength and certainty of the expectation of uncontrollability (Abramson et al., 1978).

Persons who are prone to depression tend to attribute failure (i.e., negative outcomes) to internal, global, and stable factors (Abramson, et al., 1978). In contrast, depressed individuals tend to attribute success (i.e., positive outcomes) to specific, unstable, and external factors (Abramson et al., 1978). Therefore, those at risk for depression tend to believe that it is something inherent within themselves that leads to negative outcomes. In addition, they tend to believe that they have essentially no control over the outcome of their life events.

In terms of the treatment of depression, an attributional approach proposes that it is important to change expectations of uncontrollability to those of controllability, when outcomes are obtainable, through the cognitive modification of distorted expectations (Abramson et al., 1978). Such cognitive restructuring methods may include changing unrealistic attributions for failure toward external, unstable, specific factors and changing unrealistic attributions for success toward internal, stable, global factors.

### Cognitive Distortions and Symptomatology

According to a cognitive approach, dysfunctional thought patterns contribute to subsequent emotional distress. Cognitions are deemed to be dysfunctional when they are

unrealistic or inaccurate, and when they contribute to unwanted behavioral and emotional responses (Zarb, 1992). Thus, it is the distortion, rather than the situation, which contributes to the subsequent affect experienced.

It is not uncommon for cognitive distortions to manifest as psychological symptomatology. Negative cognitions and attributions are usually present in both childhood (Bodiford, Eisenstadt, Johnson, & Bradlyn, 1988; Seligman, Kaslow, Allow, Peterson, Tannenbaum, & Abramson, 1984) and adolescent depression (Garber, Weiss, & Shanley, 1993; Marton, Connolly, Kutcher, & Korenblum, 1993; McCauley, Mitchell, Burke, & Moss, 1988). In specific, depressed youth are more likely to attribute negative events to internal, global, and stable causes, and to attribute positive events to external, unstable, and specific factors relative to nondepressed peers (Bodiford et al., 1988; Seligman et al., 1984). Finally, some (Gotlib et al., 1993) have suggested that experiencing an episode of depression early in an individual's life may result in long-term changes in cognitive functioning. Such changes can persist well into adulthood. Therefore, an adolescent with a tendency for making negative cognitions and attributions not only places himself or herself at risk for a depressive episode in adolescence, but remains at higher risk throughout adulthood.

In addition to depression, distortions in thinking also contribute to other forms of emotional and behavioral distress. Individuals with low self-esteem tend to have irrational beliefs that include demand for approval, high self-expectations, problem avoidance, helplessness, emotional irresponsibility, frustration reactivity, and anxious overconcern (Daly & Burton, 1983; McLennan, 1987). Further, persons with low self-esteem tend to view their negative life events as more personally important than positive events in comparison with those high in self-esteem (Campbell, Chew, & Scratchley, 1991).



Turning to assertive behavior, lack of assertiveness is related to maladaptive beliefs and expectations (Rich & Schroeder, 1976). Unassertive individuals are more likely to produce negative self-statements when re-enacting situations that require them to be assertive (Schwartz & Gottman, 1976).

Similarly, the self-talk of youngsters with test anxiety is also characterized by a higher level of negative evaluative thoughts and fewer positive evaluations compared to peers with little or no test anxiety (Zatz & Chassin, 1985). Thus, negative thoughts and attributions contribute to problems with low self-esteem, assertiveness, and anxiety.

### Cognitive Restructuring

Interventions that rectify faulty cognitive processes are based on the premise that negative affect and inappropriate behavior reflect errors or distortions in cognitive processing (Spence, 1994). Such interventions are designed to teach persons to be more accurate in their processing of information and include various methods of cognitive restructuring. The primary function of cognitive restructuring techniques is to teach individuals more adaptive thought patterns by helping them to detect their negative and distorted thought patterns, to recognize the deleterious impact of these thought patterns, and to replace dysfunctional cognitions with more accurate and adaptive thought patterns (Zarb, 1992).

Cognitive restructuring has been employed to ameliorate depression (e.g., Butler, Mieztis, Friedman, & Cole, 1980; Kovacs, Rush, Beck, & Hollon, 1981; Marcotte, 1997; Wright & Beck, 1984). Such techniques have also been applied to treat problems with low self-esteem (Lamke, Lujan, & Showalter, 1988; Nielsen, Horan, Keen, St. Peter, Ceperich, & Ostlund, 1996; Warren, McLellarn, & Ponzoha, 1988). Finally, cognitive restructuring has been shown to lower anxiety (Butler, Cullington, Munby, Amies, & Gelder, 1984; Heimberg,

Becker, Goldfinger, & Vermilyea, 1985; Kanter & Goldfried, 1979; Sud, 1993). It is believed that learning to analyze one's dysfunctional thinking and replacing it with more adaptive self-statements lowers anxiety by giving the person a greater sense of mastery, control, or behavioral alternatives (Jacobs & Cochran, 1982).

### Cognitive Restructuring with Adolescents

Because problems with depression, anxiety, and low self-esteem are common in adolescence, cognitive restructuring methods have been employed to alleviate such problems in the adolescent population. Cognitive restructuring has been evaluated most often in the study of adolescent depression. However, few controlled outcome studies on the effectiveness of cognitive-behavioral interventions for adolescent depression exist (Marcotte, 1997). Further, cognitive restructuring is only one form of cognitive-behavioral treatment. Therefore, even less research is available solely on the effectiveness of cognitive restructuring techniques. Research examining the effectiveness of cognitive restructuring methods in treating adolescent syndromes other than depression is also lacking. Nevertheless, a review of existing research findings regarding the effectiveness of cognitive restructuring with adolescents follows.

Cognitive restructuring procedures have been used to change depressed youngsters' maladaptive style of processing information. A cognitive restructuring intervention decreased depressive symptoms in a sample of 28 adolescents (Marcotte & Baron, 1993). This intervention consisted of 12 sessions. Participants in the treatment group received a form of rational-emotive group therapy. This form of treatment was especially effective in decreasing the following types of irrational beliefs: a tendency to dramatize, low tolerance for frustration, and irrational beliefs about self-value (Marcotte & Baron, 1993).

Another study of 54 young adolescents examined the effectiveness of cognitive restructuring in decreasing symptoms of depression (Butler et al., 1980). This intervention consisted of 10 one-hour sessions. These sessions were designed to teach the recognition of irrational, self-deprecating automatic thoughts, the adoption of more logical and viable alternatives, the enhancement of listening skills, and the recognition of the relationship between thoughts and feelings (Butler et al., 1980). Each session included didactic explanations of these concepts as well as the utilization of brief class exercises and homework, which assisted participants in applying concepts outside of group sessions. The intervention led to a decrease in participants' depressive symptoms (Butler et al., 1980). Thus, research supports the use of cognitive restructuring interventions in the reduction of adolescents' depressive symptoms.

Cognitive restructuring techniques have also been implemented to treat problems associated with low self-esteem and test anxiety. Regarding self-esteem, a study of 85 eleventh-grade students examined the effectiveness of a cognitive restructuring intervention in changing irrational beliefs that contribute to low self-esteem (Nielsen et al., 1996). This program consisted of four 50-minute sessions. Five to eight participants were assigned to each of eight groups (i.e., four experimental and four control groups). The content of the two treatments (i.e., different treatments for experimental and control groups) differed only in the specific irrational beliefs that were discussed. Irrational beliefs of demand for approval and anxious overconcern were the focus of the experimental condition. Emotional irresponsibility and blame proneness were the targeted irrational beliefs in the control condition. Group sessions involved introducing participants to the rationale for evaluating, challenging and replacing internal, irrational beliefs based on Ellis and Harper's (1975) "A-B-C" theory of

personality (Nielsen et al., 1996). Participants were also taught to refute the specific irrational beliefs targeted in their particular treatment condition. This intervention effectively produced changes in the targeted irrational beliefs that contribute to low self-esteem (Nielsen et al., 1996).

Self-esteem also improved in the cognitive restructuring intervention by Butler et al. (1980), described above. Thus, decreasing the frequency of negative self-statements and increasing the frequency of positive self-statements is an important cognitive-change technique for problems of poor self-concept (Zarb, 1992).

Cognitive restructuring interventions have also been employed to reduce test anxiety in adolescents. In a study of 30 ninth-grade girls, a cognitive restructuring program was examined to test its ability to reduce test anxiety (Sud, 1993). This intervention consisted of one 50-minute session, which included describing irrational attitudes and teaching participants to recognize irrational self-statements. The program also included a modeling component, in which the workshop facilitator shared examples from her own life, to demonstrate how she changed her own irrational self-statements in situations that involved personal evaluation. Participants practiced skills while they were presented with a hierarchy of test situations, from the least to most anxiety arousing. They also participated in an anagram task, designed to mimic a testing situation, while implementing cognitive restructuring methods. This intervention was shown to reduce participants' self-ratings of anxiety and task-generated interference when performing in a test (Sud, 1993). Thus, cognitive restructuring techniques have demonstrated effectiveness for treating problems associated with low self-esteem and test anxiety.

### **Cognitive Restructuring with Adults**

Other problems frequently experienced in adolescence include social phobia and lack of assertiveness. However, no cognitive therapy interventions for these problems with adolescent samples have been published. Thus, this paper will review outcome research conducted with adult samples.

To treat social phobia, a sample of socially phobic adults underwent a combined exposure and cognitive restructuring intervention (Kanter & Goldfried, 1979). In this program, study participants were trained to respond to imaginally presented anxiety-evoking scenes with cognitive restructuring procedures. Such procedures included the systematic identification of negative automatic thoughts and the alteration of these thoughts to reduce anxiety. Participants in this intervention evidenced significant improvement over a wait-list group in their anxious symptoms (Kanter & Goldfried, 1979).

Another study examined the effectiveness of exposure and cognitive restructuring methods in improving problems associated with social phobia in a sample of 7 adults (Heimberg et al., 1985). This intervention consisted of fourteen 90-minute sessions in which participants were guided through active imagery of anxiety-provoking social stimuli. Participants also engaged in situations with the group facilitator and each other, which were designed to represent real social situations. Upon completion of the exposure segment, the target participant was immediately involved in a period of cognitive restructuring. In this segment, participants recollected their thoughts during the exposure simulations and responded to a series of questions posed by the other participants, which were designed to challenge the thoughts of the target participant. Results showed that these socially phobic individuals experienced reductions in general anxiety, and they also experienced reductions

in social anxiety and fear of negative evaluation (Heimberg et al., 1985). Additionally, participants experienced significant changes in the attributions they made for negative outcomes. Their attributions for negative outcomes became less internal and stable after cognitive restructuring treatment (Heimberg et al., 1985).

Finally, cognitive restructuring methods have been shown to increase assertive behavior. Results of a study of 42 adults showed that cognitively-trained participants not only reported significantly less preassertion anxiety, but they actually engaged in target assertive behaviors significantly more often than those not trained in cognitive-change techniques (Jacobs & Cochran, 1982).

In general, research supports the use of cognitive restructuring with several problems associated with adolescent development. Such problems include depression, self-esteem, test anxiety, social phobia, and assertiveness. This paper will next turn to cognitive interventions for those involved in athletics.

### Cognitive Interventions with Athletes

#### Attributions and Sport

The attributions made by athletes for success or failure can influence their performance satisfaction, expectation of future success, and persistence in training and competition (Hendy & Boyer, 1993). The athlete who does not feel in control of a successful performance outcome will likely be less satisfied with his or her performance, will not expect to succeed in the future, and will not persist as heartily in training and subsequent competition. Such an attributional style minimizes the extent that the athlete believes that he or she contributes to the outcomes of his or her actions. It is especially important, both for

sport-related and esteem-related reasons, that athletes make realistic attributions (i.e., do not make cognitive distortions) for their sport performance.

Research suggests that causal attributions for successful performances differ as a function of both the relative success of the athlete and gender. Successful athletes are more likely than unsuccessful athletes to attribute performance to stable and controllable factors, such as ability and effort (Hendy & Boyer, 1993). Therefore, athletes who are relatively successful tend to believe that they have control over the outcomes of their athletic performance. For athletes who have experienced successful outcomes, they can be relatively certain that they will be successful again in future performances. When such athletes experience negative outcomes after athletic performances, they will continue to feel in control of their situations, perhaps by strategizing ways in which they can appropriately alter their actions to increase the likelihood of achieving successful outcomes next time. Such attributions serve to empower athletes regarding their general attitude towards their sport and in terms of their beliefs about the outcomes of their upcoming athletic events.

Not only do causal attributions differ according to the athlete's relative level of success, but they also differ according to gender. Male athletes usually show a self-enhancing pattern of attributing successful performances to stable ability and controllable effort, and by attributing failure to luck (Hendy & Boyer, 1993). Conversely, female athletes often show a self-defeating pattern of attributing success to uncontrollable external factors, such as luck or social support, and attributing failure to internal factors, such as lack of ability (Bird & Williams, 1980; Hendy & Boyer, 1993).

Attributional styles tend to form rather early in development. By late adolescence, male athletic performance is typically explained "solely on the basis of effort," whereas

female outcomes are attributed “only to luck” (Bird & Williams, 1980). Thus, it is not uncommon for a female adolescent athlete to believe that she has almost no control over the outcomes of her athletic performances, whereas her male peer may view himself as having a considerable amount of control over his athletic performance.

In sum, the female adolescent athlete tends to view her performances as controlled by external factors, which is an attributional style quite similar to the relatively unsuccessful athlete earlier described. In addition, by ascribing failure to the stable element of ability, girls have low expectancy for future success. Further, attributing success to external factors, they should experience little positive affect, since they perceive their success to have been environmentally determined (Bird & Williams, 1980).

The tendency for female adolescent athletes to make negative causal attributions for their athletic performance is not only detrimental to their enjoyment of their sport but also to their general feelings of self-worth. Fortunately, such attributions are an appropriate target for, and may be positively altered by, cognitive restructuring interventions. This paper will next turn to an exploration of current research regarding psychological interventions implemented with athletes.

### **Psychological Interventions with Athletes**

#### **Nature of Current Research**

It is widely accepted that stress can adversely affect athletic performance (Beech, Burns, & Sheffield, 1982; Felston & Wilcox, 1993; Martens & Landers, 1970; McCann, Murphy, & Raedeke, 1992). Thus, most psychological interventions with athletes have focused on stress management. Some of these stress management programs have included cognitive restructuring as a component, but others have not. Of those studies that included



cognitive techniques, few, if any, have analyzed the effectiveness of the cognitive restructuring component in improving athletic performance. Rather, such research has evaluated the efficacy of extensive intervention packages in improving sport performance. Therefore, it is not possible to provide a review of controlled outcome studies that examine the sole use of cognitive restructuring methods with athletes.

A second factor that may contribute to the lack of research on cognitive interventions with athletes may be the relative recency of the field of sport psychology. It has only been within the last few decades (i.e., since the 1980's) that psychological strategies and interventions began to be systematically utilized with populations of athletes.

Mostly case studies have been published in the sport psychology literature, evaluating the effectiveness of cognitive restructuring techniques in enhancing subsequent athletic performance (Silva, 1982). Although conclusions should be considered tenuous, the findings may still provide information that is useful in implementing cognitive restructuring interventions with populations of athletes. This research will now be reviewed.

#### Effectiveness of Cognitive Restructuring Techniques

The sport psychology literature has acknowledged the importance of cognitive processes in sport performance. Cognitive processes and the regulation of thoughts seem to be related to elite athletic performance and performance enhancement in general (Mahoney, 1974; Mahoney & Avenier, 1977; Suinn, 1972). Therefore, cognitive restructuring appears to be an appropriate intervention that may be applied to persons involved in sport.

Cognitive-change interventions have been employed with collegiate athletes from a variety of sports. A cognitive intervention was applied to a collegiate hockey player who experienced consistent problems committing fouls during competition (Silva, 1982). In this

intervention, this athlete learned to restructure his slashing behavior (i.e., inappropriately thrusting his hockey stick at opponents) as self-defeating and as representing a lack of self-control, instead of viewing such behavior as an effective way to retaliate against his opponents, as this athlete had previously believed. This cognitive intervention contributed to a significant reduction in penalty time and a substantial increase in playing time for this hockey player (Silva, 1982).

Two interventions have been published involving basketball players. One study focused on a collegiate basketball player's excessive fouling, which often resulted in his disqualification from competition. This intervention was designed to teach this athlete to replace old cognitive sets toward defending and rebounding with new sets that were effective yet controlled (Silva, 1982). The intervention resulted in a significant reduction in number of fouls committed, relative both to the athlete's history and to the number of fouls committed by other teammates (Silva, 1982).

A second study involved a collegiate basketball athlete who experienced consistent problems with foul-shooting accuracy. This athlete was taught to restructure his pressure response while on the free-throw line as one of relaxation and confidence. This intervention resulted in a substantial increase in free-throw accuracy relative to that of his teammates (Silva, 1982). In both case studies involving basketball athletes, their playing time significantly increased after being trained in cognitive restructuring methods (Silva, 1982).

#### Current Study

There is a need for controlled outcome studies, employing larger sample sizes, to evaluate the effectiveness of cognitive restructuring techniques with both adolescents and with athletes. **"Thinking for Success"** is an intervention designed to provide adolescent

girls with active strategies to overcome self-defeating cognitions. By training adolescents in cognitive-change methods, it was believed that their risks for experiencing problems with depression, anxiety, and self-esteem would diminish. An additional behavior targeted for change included athletic performance.

This intervention was expected to reduce symptoms of depression, anxiety and low self-esteem, because such problems are all cognitively mediated syndromes (Hains, 1992; Pope, McHale, & Craighead, 1988; Reynolds & Stark, 1987). That is, one's self-statements and beliefs directly contribute to the manifestation of each of these syndromes. Therefore, cognitive restructuring is intended to positively alter such internal processes, thereby ameliorating subsequent negative affect and behavioral responses.

By implementing the strategies taught in "**Thinking for Success**," it was hoped that participants' athletic performance would also be enhanced. Improvements in athletic performance have been related to both improvements in psychological skills and to reductions in cognitive and somatic anxiety in athletes (Holm, Beckwith, Ehde, & Tinius, 1996). Thus, the effects of enhanced athletic performance extend beyond the immediate improvements evidenced in one's sport, also positively affecting one's general emotional well-being.

The effectiveness of "**Thinking for Success**" was tested using a controlled experimental design, including random assignment to control and intervention conditions. By training teenage athletes in cognitive-change methods, the intervention broadens the scope of populations previously trained in cognitive restructuring techniques.

## **METHOD**

### **Participants**

Participants included 32 adolescent girls, between the ages of 14 and 17 years, who were involved in high school athletics. The girls' cross-country team at a midwestern public high school provided the pool from which the participants were drawn. Approval for this study was granted by Iowa State University's Institutional Review Board. The approval form is provided in Appendix A.

An initial meeting was held with the entire team ( $n = 90$ ). During this meeting, the investigator briefly described the effects that cognitions have on mood and behavior, particularly sport performance. The investigator described the intervention program, the time commitment involved, and the benefits of and compensation for participating in **"Thinking for Success."** In terms of compensation, two lottery drawings (i.e., one per cohort) were held in which a \$50 gift certificate to a local department store was given away in each drawing.

Informed consent forms were distributed to all members of the team who were present at the meeting. This form is provided in Appendix B. The investigator made phone contact with approximately 75% of the team ( $n = 67$ ). The remaining 25% of the team ( $n = 23$ ) either could not be reached by phone or did not return phone messages. Subsequently, informed consent was obtained from 44% of the girls and their legal guardians ( $n = 40$ ). After submitting their consent forms, eight girls withdrew from participation. Three girls reported being too committed to other activities to participate; one girl withdrew from the team prior to her participation in the intervention; and four girls missed one of the

intervention sessions and were unable to attend subsequent make-up sessions. Thus, the final sample consisted of 32 girls.

The participants were randomly assigned to one of two intervention groups. The first group, consisting of 17 girls, began their participation in the **“Thinking for Success”** workshop series in August, 2000. The second group, containing 15 girls, began participation four weeks after the first cohort completed the intervention procedure (September, 2000). Each intervention group was divided into small groups of 3-6 girls; thus, each session of the intervention was conducted on three separate occasions. Such a design was created to provide a non-threatening environment in which participants would experience minimal discomfort in disclosing personal information.

Girls participating in the first cohort were asked not to disclose techniques learned in the intervention to girls not participating in their group, to minimize contamination effects. The random assignment of participants to groups allowed the second cohort to serve as the control group for the first in comparisons of immediate post-intervention outcomes. A second “quasi-control group” consisted of girls who chose not to participate in the intervention.

### Procedure

**“Thinking for Success”** was an intervention consisting of two hour-long workshop sessions. Each session had both didactic and experiential components. The first session included education regarding the influence of thoughts on mood and behavior. This session also involved teaching participants the purpose and procedure of completing thought logs. Participants were taught to identify automatic thoughts, to weigh supporting and contradictory evidence to evaluate the accuracy of these thoughts, and to alter their thoughts

to be more congruent with their actual situations. During this session, thirty minutes was devoted to psychoeducation, and thirty minutes was designated for small-group activity. After the first session, participants maintained a daily thought log for one week, until the second meeting. Participants were also provided with contact information for the investigator and were encouraged to call with any questions pertaining to the maintenance of a daily thought log.

The second session, one week after the first, provided the participants with an opportunity to gain clarification or express concerns regarding the thought log. It also served as an opportunity to continue practicing the skills taught in the first session, using experiential learning techniques. An estimated twenty minutes was devoted to psychoeducation, and forty minutes was spent on experiential learning during this session. The lesson plans for both workshops are included in Appendix C.

After completion of the second session, participants were instructed to complete one thought log daily for the next four weeks. Participants were directed to deposit thought logs at least once weekly in a drop-box located in the main office of their high school.

Phone contact was made with each participant both one and three weeks after completion of the workshops. For all participants, this phone call served as an opportunity to ask the investigator questions regarding the thought log procedure. Phone contact also served as a reminder to those participants who had not been meeting their thought log quota (i.e., seven logs per week).

All participants completed questionnaires regarding current feelings of depression, anxiety, self-esteem, loneliness, and self-efficacy at the initial meeting with the investigator (Time 1). The same assessment protocol was also administered to all participants one month

after the completion of Cohort 1's intervention program, immediately prior to Cohort 2's participation in the intervention (Time 2). An additional assessment of self-efficacy was obtained from each cohort immediately after the respective completion of the second workshop. Finally, the full battery of questionnaires was repeated one month after the completion of Cohort 2's program (Time 3). A listing of dependent variables and measures used to assess these variables is provided in Appendix D. A detailed timeline, displaying dates of intervention sessions and assessments, is included in Appendix E.

Additional data were collected that provided information on participants' athletic performance. Times in cross-country events served as the measure of sport performance. Information was obtained on each timed trial for the 2000-2001 season. Obtaining this information continuously throughout the season allowed for analysis of potential change in athletic performance subsequent to participants' involvement in **"Thinking for Success."** Table 1 provides information regarding the reliability of each dependent variable that was psychological in nature.

### Measures

#### Depression Adjective Checklist.

The Depression Adjective Checklist (DACL, Form A; Lubin, 1965) was utilized as the primary measure of depressive symptomatology. This instrument was developed to measure transient depressive mood, feelings, or emotions rather than trait-like depression. When completing the measure, participants are asked to indicate which of thirty-four feelings they are currently experiencing. One such item is "downcast." Total scores are obtained by adding the total number of items endorsed by each participant, yielding a potential range of scores from 0 to 34.

The DACL has demonstrated reliability in measuring depressed mood. When normed, the split-half reliability for Form A of this measure was found to be 0.92 in a sample of outpatient women (Lubin, 1965). The coefficient alpha obtained in this sample was 0.61.

When Form A of the DACL was correlated with the Depression Scale of the Minnesota Multiphasic Personality Inventory (MMPI), a validity coefficient of 0.46 was obtained in a sample of outpatient women (Lubin, 1965). Similarly, a validity coefficient of 0.50 resulted when this form of the DACL was correlated with the Beck Depression Inventory (BDI) in a sample of female outpatients (Lubin, 1965). Although reliability and validity coefficients were obtained with adult samples, the DACL was chosen as the primary measure of depression for this study due to its demonstrated reliability, brevity, and the use of non-pathologizing language, which may be less intimidating to a sample of adolescents.

#### Rosenberg Self-Esteem Scale.

The Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965) is a ten-item self-report measure of self-esteem, containing two factors: Positive Self-Esteem and Self-Derogation (Openshaw, Thomas, & Rollins, 1981). The Positive Self-Esteem factor includes questions that assess whether the individual values himself or herself as a person of worth, possesses a number of good qualities, and more generally perceives his or her attributes and abilities as comparable with those of his or her peers (Openshaw et al., 1981). One such item is “I feel that I have a number of good qualities.” The Self-Derogation factor includes questions concerning derogation of one’s abilities, attributes, and potential. An item assessing this factor is “I feel I do not have much to be proud of.” Participants responded to each item using a Likert scale from 1 (i.e., strongly agree) to 4 (i.e., strongly disagree). Responses to



items measuring Self-Derogation were recoded, so higher total scores on this measure indicated higher self-esteem.

There is strong evidence for this instrument's reliability and validity. Coefficient alphas for the two factors are 0.80 for the Positive Self-Esteem factor and 0.72 for the Self-Derogation factor (Openshaw et al., 1981). Internal consistency reliability obtained in this sample of adolescents was 0.86. Regarding validity, when correlated with other self-esteem scales, results yielded validity coefficients of 0.67 for the Role Repertory Test (Kelly, 1955) and 0.83 for the Self-Image Questionnaire (Heath, 1966; Silber & Tippet, 1965). Though these statistics were obtained from adult samples, it was believed that the RSE would provide a fair assessment of self-esteem in adolescent samples. Its reliability, brevity, and use of comprehensible language for an adolescent population were considered as assets in using the RSE as the primary measure of self-esteem for this study.

#### Self-Beliefs Questionnaire.

I designed a questionnaire to assess level of self-efficacy in areas relevant to the lives of female adolescent athletes. Questions assessed participants' level of confidence in managing homework and other school tasks (e.g., "How confident are you that you will complete and hand in your homework on time?"), dealing with peer, sibling, and parental conflict (e.g., "How confident are you that you will successfully solve conflicts in your personal relationships?"), improving athletic performance (e.g., "How confident are you that you will not be excessively nervous prior to running your next cross-country event?"), enhancing body image (e.g., "How confident are you that you will be satisfied with your body's shape?"), and coping with stress (e.g., "How confident are you that you will be able to handle the stresses that face you at this time of year?"). Questions were also included to

assess the skills taught in the workshop: level of efficacy for identifying negative thoughts, challenging those thoughts, and creating more realistic cognitions that seemed to more appropriately fit their situations (e.g., “How confident are you that you will be able to challenge at least one of your negative beliefs?”). Participants responded to each item, using a Likert scale from 0 (i.e., not at all confident) to 3 (i.e., very confident). Total scores were obtained by adding values from each item, yielding a possible score range from 0 to 51. Higher scores suggested higher levels of self-efficacy. A copy of this measure, in addition to other instruments available to the general public (i.e., Rosenberg Self-Esteem Scale, UCLA Loneliness Scale), is included in Appendix F. This measure appears to provide a reliable assessment of self-efficacy as evidenced by an internal consistency coefficient of 0.86.

#### State-Trait Anxiety Inventory.

The State-Trait Anxiety Inventory (STAI-Form Y; Spielberger, 1983) has been used more extensively in psychological research than any other anxiety measure (Buros, 1978). It consists of separate self-report scales that measure two distinct anxiety constructs: state anxiety and trait anxiety. Characteristics assessed by questions measuring state anxiety include feelings of apprehension, tension, nervousness, and worry (Spielberger, 1983). One such item is “I am tense.” The trait anxiety scale is useful for identifying persons with chronic or more persistent anxiety symptoms. An item measuring trait anxiety is “I worry too much over something that really doesn’t matter.” Participants responded to each item using a Likert scale from 1 (i.e., almost never) to 4 (i.e., almost always). After items reflecting the absence of anxiety were recoded, total scores were calculated by adding values for all responses, such that higher total scores were suggestive of higher levels of anxiety. Possible total scores range from 40 to 160.

The STAI was originally developed for use with high school and college student populations, thus it is an appropriate measure of anxious mood for the current sample of adolescents. Reliability was assessed among high school students. After test-retest intervals of 30 and 60 days in an outpatient sample of female high school students, results yielded reliability coefficients of 0.75 and 0.65, respectively, for the Trait scale (Spielberger, 1983). Reliability coefficients were lower for the State scale, which would be expected, given that it is a measure of transitory versus stable anxiety symptoms. This scale yielded reliability coefficients of 0.34 and 0.36 after test-retest intervals of 30 and 60 days, respectively, in an outpatient sample of female high school students (Spielberger, 1983).

In terms of internal consistency, both scales appear to provide an internally consistent measure of anxiety symptoms. In a sample of female high school students, coefficient alphas of 0.94 and 0.90 have been found for the State and Trait scales, respectively (Spielberger, 1983). Internal consistency reliability for the STAI in this sample was 0.93.

Regarding validity, evidence exists for the convergent validity of the STAI. Scores on the STAI are strongly associated with relevant scales of the MMPI. When scores for the two instruments were correlated, the STAI correlated highly with scales of the MMPI that reflect high levels of acute anxiety: Depression, Psychasthenia, and Schizophrenia scales. Validity information was obtained on two inpatient samples. Validity coefficients ranged from 0.44 to 0.57, 0.45 to 0.79, and 0.46 to 0.71 when the State scale of the STAI was compared to the MMPI scales of Depression, Psychasthenia, and Schizophrenia, respectively, in the two samples (Spielberger, 1983). The Trait scale of the STAI obtained validity coefficients ranging from 0.57 to 0.61, 0.65 to 0.81, and 0.68 to 0.75 when compared to the MMPI scales of Depression, Psychasthenia, and Schizophrenia, respectively, in the two

samples (Spielberger, 1983). Thus, one would expect these scales to strongly correlate with the STAI.

#### UCLA Loneliness Scale.

The UCLA Loneliness Scale (Version 3; Russell, 1994) has been widely used in research on loneliness (Russell, 1996). It has been administered to a variety of populations, including college students, nurses, teachers, and the elderly. The latest revision (Version 3) differs from previous versions of the instrument in that both the response format and the wording of the items have been simplified. Thus, this measure seemed appropriate to utilize with an adolescent population.

In completing this measure, participants respond to twenty questions about the extent to which they feel lonely. Some questions are phrased to suggest more loneliness (e.g., “How often do you feel left out?”), and others suggest social connectedness (e.g., “How often do you feel outgoing and friendly?”). Participants responded to each item using a Likert scale from 1 (i.e., never) to 4 (i.e., always). Questions indicative of social connectedness were recoded, such that higher total scores suggested higher levels of loneliness. Possible total scores range from 20 to 80.

Psychometric evidence demonstrates that the UCLA Loneliness Scale provides both a reliable and valid assessment of the construct. In terms of internal consistency, coefficient alphas range from 0.89 to 0.94 across the samples in which it has been applied (Russell, 1996). A one-year test-retest interval has yielded a reliability coefficient of 0.73 (Russell, 1996). Internal consistency reliability obtained in this sample was 0.94.

Evidence exists for the scale’s convergent and construct validity. In terms of convergent validity, scores on the UCLA Loneliness Scale have been found to strongly relate

to other measures of loneliness. Validity coefficients of 0.65 and 0.72, respectively, resulted when the UCLA Loneliness Scale was correlated with the NYU Loneliness Scale and the Differential Loneliness Scale (Russell, 1996). Loneliness scores significantly relate to such trait dimensions as Neuroticism and Introversion-Extroversion (Russell, 1996). Strong associations have also been found between scores on the UCLA Loneliness Scale and some consequences of loneliness, including depression and self-esteem, with correlations of 0.52 and  $-0.60$ , respectively (Russell, 1996). Thus, strong evidence exists for both the reliability and validity of the UCLA Loneliness Scale.

### Hypotheses

1. Participants in the first cohort who completed the intervention will experience a significant decrease in self-reported anxiety, depression, and loneliness and/or a significant increase in self-esteem and self-efficacy for adolescent-athlete concerns when compared to participants in the second intervention group who had not yet begun the intervention.
2. Participants in the first cohort who had completed the intervention will experience significant improvement in athletic performance, as demonstrated by a significant decrease in running time, in comparison to participants in the second cohort who had not yet begun the intervention.
3. Girls who participated in the intervention will experience significant improvement in athletic performance, as evidenced by a substantial decrease in running time, in comparison to non-participants.
4. If significant cohort effects are found for either psychological variables or for athletic performance, practicing workshop skills (e.g., completing thought logs, self-

efficacy for practicing workshop skills) will mediate the relationship between cohort group and improvement in relevant outcome measures.

#### Analyses of Power

Power analyses were conducted to determine whether the sample size for this study was large enough to detect differences of various magnitudes between intervention groups. Cohen (1988) considered effect sizes of .20 to be small, .50 to be medium, and .80 to be large. The minimum power that is typically considered acceptable to detect a significant effect at  $p < .05$  is .80 (Kirk, 1995). To detect a moderate effect size with power of .80 at  $p = .05$  would require a sample size of approximately 50 per group. The study sample size of approximately 20 per condition was sufficient only to detect large effects with power of .80.

## **RESULTS**

Analyses were conducted to test for differences in psychological (i.e., depression, anxiety, loneliness, self-esteem, self-efficacy for adolescent-athlete concerns) and athletic (i.e., times in athletic events) outcomes between the two cohorts. These comparisons were made on data collected after Cohort 1 completed the intervention and before Cohort 2 began the intervention. In addition, analyses were conducted, testing for differences in athletic performance between participating and non-participating girls. These comparisons were made after both cohorts had completed the intervention.

In order to assess for differences in psychological outcomes between intervention cohorts, a variety of paper-and-pencil instruments was utilized. Reliability coefficients were computed for each of these measures. In general, the instruments were found to provide reliable indicators of the variables of interest for this sample of female adolescent athletes. Reliability coefficients ranged from 0.61 for the Depression Adjective Checklist (Lubin, 1965) to 0.94 for the UCLA Loneliness Scale (Russell, 1994). The reliability of each of these measures is summarized in Table 1.

Reliability coefficients were also computed for each subsection of the Self Beliefs Questionnaire ( $\alpha = 0.86$ ), which was the instrument created to measure self-efficacy for a variety of adolescent-athlete concerns. Alpha coefficients ranged from 0.66 for questions pertaining to self-efficacy for school concerns to 0.88 for the questions assessing self-efficacy for practicing workshop skills. Table 1 also contains the reliability coefficients for each subsection of the Self Beliefs Questionnaire. Tables 2 through 4 provide correlations among the psychological variables and number of completed thought logs for Times 1, 2, and 3, respectively.

Prior to conducting analyses that tested for cohort effects on psychological outcome measures, a set of analyses was conducted to detect differences that may have existed between cohorts prior to participation in the intervention. A series of independent samples t-tests was performed prior to either cohort's participation in the intervention. The data from 32 girls (i.e., 17 girls included in Cohort 1; 15 girls in Cohort 2) were included in these analyses. Results from these analyses indicated that there was a significant difference between cohorts on self-esteem ( $t = 2.24$ ;  $p = .03$ ). Prior to participating in the intervention, girls in the first intervention group reported higher levels of self-esteem than did those in the second intervention group ( $M$  Cohort 1 = 31.65;  $M$  Cohort 2 = 27.93). There also existed a marginally significant difference between cohort groups on the level of self-efficacy for school concerns ( $t = 1.91$ ;  $p = .07$ ), such that the participants in Cohort 1 reported a higher level of efficacy for handling schoolwork and other academic concerns ( $M$  Cohort 1 = 2.18;  $M$  Cohort 2 = 1.82). Finally, there was a marginally significant, pre-intervention difference ( $t = -1.70$ ;  $p = .10$ ) between cohort groups on the measure of state anxiety. The participants in Cohort 1 reported a lower level of state anxiety at the Time 1 assessment ( $M$  Cohort 1 = 37.59;  $M$  Cohort 2 = 43.13) than did the participants in Cohort 2. No other significant differences were found between intervention groups prior to participating in the intervention. Table 5 contains the results of these analyses.

To test for post-intervention differences on psychological variables between Cohorts 1 and 2, analyses of covariance were conducted at Time 2 on the following dependent measures: depression, anxiety, loneliness, self-esteem, and self-efficacy for a variety of teen-athlete concerns. At this assessment, Cohort 1 had completed the intervention and Cohort 2 had not yet begun the intervention. The Time 1 value on the dependent measure served as



the covariate in each analysis. Significant cohort effects were found at Time 2 for self-efficacy regarding several adolescent-athlete concerns. The participants in Cohort 1 reported a higher level of efficacy for coping ( $F = 7.73$ ;  $p = .009$ ), cross-country and physical-fitness abilities ( $F = 5.75$ ;  $p = .02$ ), practicing workshop skills ( $F = 5.99$ ;  $p = .02$ ), and improving their body image ( $F = 6.66$ ;  $p = .02$ ). There was a nonsignificant but suggestive tendency for participants in Cohort 1 to report less trait anxiety than those in Cohort 2 ( $F = 2.69$ ;  $p = .11$ ). Significant differences between cohort groups were not found for depression, loneliness, self-esteem, state anxiety, or self-efficacy for close relationships and school. Table 6 summarizes the results of these analyses.

Additional analyses of Time 2 variables were performed, in order to obtain effect sizes for differences in mean scores between intervention cohorts. Effect sizes are difference scores (i.e.,  $d$ -scores) that are expressed in standard deviation units, essentially providing standard scores (Cohen, 1988).  $D$ -scores were computed for each psychological variable score, in order to provide a standard comparison of scores between intervention groups. Results from these analyses suggested that the current sample size was not large enough to detect small or medium effect sizes. Power to detect a significant effect at  $p < .05$  (one-tailed test) for each of these variables ranged from .19 for depression to .51 for loneliness. Variables with moderate effect sizes would have required a sample size of 50 per group for 80% power to detect a statistically significant difference with an alpha of .05.

Further analyses were conducted on the psychological variables to assess for change over time in the entire sample of intervention participants. Paired  $t$ -tests were conducted, comparing mean scores on the psychological measures for all intervention participants pre- (i.e., Time 1) and post-intervention (i.e., Time 3). These analyses suggest that athletes who

chose to participate in the intervention evidenced significant changes over time on several psychological variables. Girls who participated in **“Thinking for Success”** experienced significant increases in self-esteem ( $t = -2.01$ ;  $p = .05$ ) and in their levels of efficacy for coping ( $t = -4.12$ ;  $p = .0001$ ), cross-country and physical-fitness abilities ( $t = -4.57$ ;  $p = .0001$ ), practicing workshop skills ( $t = -3.59$ ;  $p = .001$ ), and improving their body image ( $t = -3.46$ ;  $p = .002$ ). In addition, intervention participants reported a significant decrease in both state ( $t = 2.86$ ;  $p = .01$ ) and trait anxiety ( $t = 2.31$ ;  $p = .03$ ). Table 7 contains the results of these analyses.

In addition to examining differences in psychological variables as a function of the intervention, differences in athletic performance were also assessed. For various reasons (e.g., poor health, injury, failure to qualify to compete), many athletes missed several meets throughout the cross-country season. Consequently, there existed several missing cells in the data set pertaining to cross-country performance. In order to provide a representative sample of athletes' running performance, only data from girls who participated in at least 50% of the season's meets were included in these analyses. Thus, fewer participants were included in this set of analyses ( $n = 27$ ) than in the analyses of psychological outcomes ( $n = 32$ ).

Throughout the cross-country season, the most commonly missed timed events were the first and last events of the season. The first timed trial occurred early in the cross-country season and was introduced by the coach as a pre-qualifying trial that was not a mandatory event. Hence, many of the athletes did not run in this trial (Meet 1). Similarly, many of the girls did not run in the last meet (Meet 10) of the season. This timed event was the district meet in which runners must qualify in order to compete. Because many of the athletes did

not compete in these two events, data were included from Meets 2 through 9 for this set of analyses.

The issue of missed cross-country events also arose in meets throughout the season. To accommodate for data that were missing for any meet that occurred between Meets 2 through 9, missing cross-country times were extrapolated from the running times that immediately preceded and followed the meet in which the athlete did not participate. For example, if a participant did not run in Meet 6, this missing cell was completed with the mean of her times for Meets 5 and 7. Thus, athletes' running times from Meets 2 through 9, some of which were extrapolated from meets close in proximity to a missing time, were utilized for the analyses of athletic performance. After these adjustments were made to the data, the data from 27 participants (i.e., 15 girls in Cohort 1; 12 girls in Cohort 2) were used to perform the analyses of athletic performance.

Differences in athletic performance as a function of the intervention were examined. T-tests for independent samples were computed, comparing mean running times for Cohorts 1 and 2. Tests were performed on mean running times at Meet 5, which is the meet consistent with Cohort 1's completion of the intervention and Cohort 2's lack of involvement with the intervention. In that way, cohort effects in terms of athletic performance could be assessed. Analyses were also performed at Meet 9, the end of the season, after both cohorts had completed the intervention. Finally, comparisons were made between mean running times of intervention participants and non-participants at season's end (i.e., Meet 9). Results indicated that there were no significant differences in running times between groups. These results are presented in Table 8.

At the completion of Cohort 1's intervention and before Cohort 2 began the intervention, a hierarchical regression analysis was performed on cross-country meet performance times. The girls competed in 4 meets during this time period. In this analysis, cross-country time at Meet 5 served as the dependent variable. Running time at Meet 2 was entered into the regression equation first to control for athletes' running performance at the beginning of the season, followed by a dummy-coded variable for intervention cohort (0 = Cohort 1, 1 = Cohort 2). If this analysis resulted in a significant beta weight for cohort group, it would mean that participating in the intervention (i.e., Cohort 1 having completed the intervention versus Cohort 2 not having begun the intervention) was a significant predictor of one's athletic performance at Meet 5. Results from this analysis suggested that cohort group did not significantly predict an athlete's performance in Meet 5 ( $B = .16$ ;  $p = .48$ ). Table 9 contains the results from this analysis.

Power to detect significant effects was once again an issue, given the small sample size. Power to detect a small, medium, and large effect of cohort on Meet 5 time was computed, given one covariate (Meet 2 time) that explained 36% of the variance in the dependent measure. For a small effect, power was .28; for a medium effect, power was .99; and for a large effect, power was 1.0. The actual variance explained by cohort was .025. To detect a significant relation of this magnitude would have required an  $N$  of 163.

Because performance times were available for the entire cross-country team, another regression analysis was performed post-intervention to detect any differences in cross-country performance as a function of intervention participation. Once the intervention had been completed by all participants, a hierarchical regression analysis was performed to assess for potential differences in athletic performance as a function of the intervention, through the

comparison of intervention participants and non-participants. A hierarchical regression analysis was conducted in which cross-country time at Meet 9 served as the dependent variable. Running time at Meet 2 was entered in the first step of the regression equation to control for initial athletic performance. A dummy-coded variable for intervention participation (1 = participants, 0 = non-participants) was next entered into the equation. If the participation variable showed a significant beta weight, it would mean that participation in the intervention significantly predicted one's athletic performance at the last meet of the season. Results from this analysis indicated that participating in the intervention did not significantly influence one's athletic performance at the end of the cross-country season ( $B = .23$ ;  $p = .28$ ). The results from this analysis are provided in Table 10.

Power to detect a small, medium, and large effect of cohort on Meet 9 time was computed, given one covariate (Meet 2 time) that explained 31% of the variance in the dependent measure. For a small effect, power was .56; for a medium effect, power was 1.0; and for a large effect, power was 1.0. The actual variance explained by cohort was .05. To detect a significant relation of this magnitude would have required an  $N$  of 104.

To examine athletic performance for all cross-country athletes throughout the course of the season, visual depictions of these data were also constructed to examine trends in athletic performance related to the timing of intervention participation. The mean running times at each timed event from Meets 2 through 9 for athletes in both intervention groups and non-participants were graphed. Upon visual examination of this graph, several trends were noted.

First, Cohort 1 was consistently the fastest group of runners, followed by the non-participants and Cohort 2, respectively. This pattern persisted throughout the cross-country

season. (Mean running times at Meet 2 were as follows: 17.64 min for Cohort 1, 19.09 min for Cohort 2, and 18.02 min for the non-participants. Mean running times at Meet 9 were: 15.58 min for Cohort 1, 16.87 min for Cohort 2, and 15.74 min for the non-participants.) Second, the performance of all athletes gradually improved from Meets 2 through 5, the midpoint of the season. All groups of girls experienced the largest improvement in their running performance at Meet 3. (Mean decrease in running times from Meets 2 to 3 were as follows: 1.44 min for Cohort 1, 1.86 min for Cohort 2, and 1.77 min for the non-participants.) Next, all girls experienced another marked improvement in their athletic performance at Meet 6. (Mean decrease in running time from Meets 5 to 6 were as follows: 0.62 min for Cohort 1, 0.82 min for Cohort 2, and 0.49 min for the non-participants.) Finally, it appeared that the athletic performance of all athletes tended to decline after Meet 6. Though some improvements were made (i.e., slight decrease in mean running times for Cohort 1 and the non-participants at Meet 8), running times generally worsened between the midpoint and the end of the cross-country season. This graph is provided in Appendix G.

After analyses of psychological and athletic outcomes were completed, follow-up analyses were conducted. These analyses were utilized to examine whether significant cohort effects for improvements in outcome measures, as assessed at Time 2, were a function of skills learned during the intervention. As noted previously, at Time 2, significant cohort effects were found for the following psychological variables: self-efficacy for practicing workshop skills, self-efficacy for cross-country and physical fitness, self-efficacy for body image, and self-efficacy for coping. In each case, Cohort 1 was found to report more self-efficacious behavior than their counterparts in Cohort 2. Similarly, though not significant, girls in Cohort 1 experienced less trait anxiety than those in Cohort 2 ( $F = -2.69$ ;  $p = .11$ ).

No significant cohort effects were found for the athletic performance data. Therefore, follow-up analyses were performed on the relevant self-efficacy measures and on trait anxiety.

In order to determine whether cohort effects were influenced by skills taught in the intervention, correlation coefficients were computed. The variable representing workshop skills for this analysis was the completion of thought logs. First, change in the dependent measure was computed by subtracting the score on the dependent measure (e.g., self-efficacy for practicing workshop skills) at Time 1 from the score on the dependent measure at Time 2. (Time 2 was the assessment consistent with the completion of Cohort 1's intervention participation and prior to the intervention participation of Cohort 2.) Next, this change score was correlated with number of completed thought logs, in order to determine whether a significant relationship existed between change in the scores on the dependent measures and the act of completing thought logs. Results from these analyses indicated that a significant relationship existed between change in trait anxiety and number of completed thought logs ( $r = -.39$ ;  $p = .03$ ), such that as number of thought logs increased, the decrease in trait anxiety increased. No significant relationship existed between change in any of the self-efficacy variables and number of completed thought logs. These results are provided in Table 11.

An additional analysis was conducted in the case of the anxiety measure, in order to examine whether intervention skills predicted the change in trait anxiety, once all participants had completed the intervention. A hierarchical regression analysis was performed for this purpose. The variables representing intervention skills for this analysis were number of completed thought logs and self-efficacy for practicing workshop skills. The dependent variable was change in trait anxiety, which was computed by calculating the difference

between scores on this measure at Time 2 and Time 1. The Time 1 score on trait anxiety was entered in the first step of the regression equation to control for pre-intervention anxiety level. Number of completed thought logs was entered next. Change in self-efficacy for practicing workshop skills was added in the final step of the equation. If either number of completed thought logs or change in self-efficacy for practicing workshop skills showed a significant beta weight, it would mean that skills taught during the course of the intervention significantly predicted the change in trait anxiety evidenced by the first cohort.

Results from this analysis indicated that both number of completed thoughts logs and change in self-efficacy for practicing workshop skills significantly predicted change in trait anxiety ( $B = -.30$ ,  $p = .04$  for number of completed thought logs;  $B = -4.11$ ,  $p = .02$  for change in self-efficacy for practicing workshop skills). Results suggested that not only did the act of completing thought logs contribute to a significant decrease in trait anxiety, but level of efficacy for practicing skills taught during the intervention also contributed to this effect. These results are summarized in Table 12.

Because the intervention incorporated the completion of thought logs for four weeks outside of the structured workshop meetings, it may have been possible for a delayed cohort effect to occur. Analyses were conducted to test this possibility. In this case, one would expect that the first intervention cohort would evidence more positive scores on at least one psychological variable at Time 3 or faster running times at the end of the season (Meet 9), because they had completed the intervention first and, therefore, had exposure to this information for a longer period of time.

Analyses of covariance were used to test for delayed intervention effects in the psychological variables. The Time 3 score for each psychological outcome measure served



as the dependent measure, and the Time 1 score for each respective measure was the covariate. Results from these analyses were all non-significant, which indicated that no delayed cohort effect existed on any psychological measure.

To test for a delayed cohort effect on athletic performance, a hierarchical regression analysis was performed. This analysis examined whether a significant difference in athletic performance existed between intervention groups at the last timed event of the season. For this analysis, running time at Meet 9 served as the dependent variable. Cross-country time at Meet 2 was entered into the regression equation first, controlling for athletic performance at the season's outset. A dummy-coded variable reflecting intervention group (0 = Cohort 1, 1 = Cohort 2) was entered next. Results from this analysis suggested that cohort group (i.e., Cohort 1 having completed the intervention 6 weeks prior to Cohort 2) did not significantly contribute to athletic performance at the last meet of the season ( $B = .32$ ;  $p = .33$ ). Thus, it appeared to be irrelevant whether one group had exposure to the skills acquired in **“Thinking for Success”** for a longer period of time. The act of participating in the intervention, in and of itself, seemed to be the contributing factor to any significant cohort effects.

Table 1

Reliability of Outcome Measures

Measure	Items	Score Range	$\alpha$
Anxiety	40	40-160	0.93
Depression	34	0-34	0.61
Loneliness	20	20-80	0.94
Self-esteem	10	10-40	0.86
Self-efficacy	17	0-51	0.86
Body image	1		N/A
Close relationships	3		0.83
Coping	1		N/A
Cross-country/Physical fitness	5		0.75
School	3		0.66
Workshop skills	4		0.88

Note. Reliability coefficients obtained through tests of internal consistency (i.e., coefficient alphas). 32 participants completed each measure. Score range indicates the possible range of score values obtained on each measure. Reliability coefficients that are labeled "N/A" denote subscales that used one item to measure that construct.

Table 2

Correlations among Psychological Variables and Number of Completed Thought Logs at Time 1

	<u>Depression</u>	<u>State Anxiety</u>	<u>Trait Anxiety</u>	<u>Loneliness</u>	<u>Self-Esteem</u>	<u>Self-Efficacy</u>	<u>Thought Logs</u>
Depression	1.00	.69 **	.40 *	.40 *	-.40 *	-.31	.14
State Anxiety		1.00	.62 **	.70 **	-.59 **	-.49 **	.19
Trait Anxiety			1.00	.70 **	-.78 **	-.69 **	.30
Loneliness				1.00	-.75 **	-.72 **	-.11
Self-Esteem					1.00	.64 **	-.04
Self-Efficacy						1.00	-.05
Thought logs							1.00

Note. Self-efficacy represents a total self-efficacy score from the addition of all scores on subscales of this measure. Mean number of thought logs completed by each participant was 12.72 (SD = 8.01).

\*  $p \leq .01$ ; \*\*  $p \leq .05$

**Table 3**

**Correlations among Psychological Variables and Number of Completed Thought Logs at Time 2**

	<u>Depression</u>	<u>State Anxiety</u>	<u>Trait Anxiety</u>	<u>Loneliness</u>	<u>Self-Esteem</u>	<u>Self-Efficacy</u>	<u>Thought Logs</u>
Depression	1.00	.75 **	.58 **	.68 **	-.53 **	-.52 **	-.16
State Anxiety		1.00	.65 **	.67 **	-.59 **	-.58 **	-.23
Trait Anxiety			1.00	.76 **	-.83 **	-.63 **	.00
Loneliness				1.00	-.77 **	-.71 **	-.16
Self-Esteem					1.00	.61 **	.10
Self-Efficacy						1.00	-.03
Thought logs							1.00

**Note.** Self-efficacy represents a total self-efficacy score from the addition of all scores on subscales of this measure. Mean number of thought logs completed by each participant was 12.72 (SD = 8.01).

\*  $p \leq .01$ ; \*\*  $p \leq .05$

Table 4

**Correlations among Psychological Variables and Number of Completed Thought Logs at Time 3**

	<u>Depression</u>	<u>State Anxiety</u>	<u>Trait Anxiety</u>	<u>Loneliness</u>	<u>Self-Esteem</u>	<u>Self-Efficacy</u>	<u>Thought Logs</u>
Depression	1.00	.72 **	.55 **	.51 **	-.45 **	-.70 **	.20
State Anxiety		1.00	.72 **	.71 **	-.60 **	-.76 **	-.03
Trait Anxiety			1.00	.86 **	-.82 **	-.77 **	.04
Loneliness				1.00	-.78 **	-.74 **	-.01
Self-Esteem					1.00	.65 **	.07
Self-Efficacy						1.00	-.19
Thought logs							1.00

**Note.** Self-efficacy represents a total self-efficacy score from the addition of all scores on subscales of this measure. Mean number of thought logs completed by each participant was 12.72 (SD = 8.01).

\*  $p \leq .01$ ; \*\*  $p \leq .05$

Table 5

**Mean Scores for Cohorts 1 and 2 at Time 1**

Variable	Cohort 1 ( <u>n</u> = 17)		Cohort 2 ( <u>n</u> = 15)		<u>LL</u>	<u>UL</u>	<u>t</u>	<u>p</u>
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>				
Depression	7.82	3.68	7.53	4.00	-2.48	3.06	.21	.83
Loneliness	38.47	11.76	44.00	9.54	-13.33	2.27	-1.45	.16
Self-Esteem	31.65	4.86	27.93	4.45	.33	7.09	2.24	.03**
State Anxiety	37.59	9.64	43.13	8.68	-12.20	1.11	-1.70	.10 *
Trait Anxiety	41.94	10.45	42.60	9.05	-7.77	6.45	-.19	.85
<b>Self-Efficacy</b>								
Body image	1.94	.97	1.80	1.01	-.57	.86	.40	.69
Close relationships	2.24	.72	2.24	.62	-.50	.48	-.04	.97
Coping	1.65	.93	1.67	.72	-.63	.59	-.07	.95
Cross-Country/Fitness	1.92	.55	1.81	.50	-.28	.48	.56	.58
School	2.18	.57	1.82	.47	-.02	.73	1.91	.07 *
Workshop skills	2.07	.60	2.00	.77	-.42	.57	.30	.76

**Note.** Neither cohort group had begun the intervention at Time 1.

\*  $p \leq .10$ ; \*\*  $p < .05$

Table 6

Mean Scores for Cohorts 1 and 2 at Time 2

Variable	Cohort 1 ( <u>n</u> = 17)		Cohort 2 ( <u>n</u> = 15)		<u>LL</u>	<u>UL</u>	<u>F</u>	<u>d</u>	<u>p</u>
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>					
Depression	7.82	5.81	9.13	4.72	-5.23	2.42	.56	-.25	.46
Loneliness	35.53	12.70	42.33	8.92	-7.45	2.86	.83	-.62	.37
Self-Esteem	33.94	4.94	29.40	4.37	.44	.98	2.19	.07	.15
State Anxiety	36.06	11.59	42.40	10.30	-10.75	4.27	.78	-.57	.38
Trait Anxiety	38.06	9.70	42.33	8.65	-8.61	.94	2.69	-.47	.11
Self-Efficacy									
Body image	2.35	.70	1.80	.56	.10	.84	6.66	.92	.02 *
Close relationships	2.39	.71	2.31	.50	-.20	.38	.38	.16	.54
Coping	2.35	.79	1.80	.56	.15	.98	7.73	.71	.009**
Cross-Country/Fitness	2.54	.58	2.08	.46	.06	.78	5.75	.72	.02 *
School	2.12	.70	1.76	.56	-.28	.58	.52	.46	.48
Workshop skills	2.60	.67	2.13	.41	.07	.81	5.99	.88	.02 *

Note. Cohort 1 had completed the intervention, and Cohort 2 had not yet begun the intervention at Time 2. F values are the results of analyses of covariance on Time 2 variables, controlling for Time 1 values. Df for analyses of covariance were 1, 29.

\*  $p \leq .05$ ; \*\*  $p \leq .01$

Table 7

Mean Scores for Total Intervention Sample at Times 1 and 3 (Pre- and Post-Intervention)

Variable	Time 1		Time 3		<u>LL</u>	<u>UL</u>	<u>t</u>	<u>p</u>
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>				
Depression	7.69	3.77	7.88	5.25	-3.56	4.27	-.17	.87
Loneliness	41.06	10.97	38.16	11.16	-8.34	3.94	1.91	.07
Self-Esteem	29.91	4.97	31.50	5.01	-3.21	.03	-2.01	.05 *
State Anxiety	40.19	9.48	35.16	11.59	-9.34	5.53	2.86	.01 **
Trait Anxiety	42.25	9.67	38.19	9.89	-10.28	2.34	2.31	.03 *
Self-Efficacy								
Body image	1.88	.98	2.31	.74	-.39	.42	-3.46	.002 **
Close relationships	2.24	.67	2.41	.65	-.31	.51	-1.50	.14
Coping	1.66	.83	2.31	.74	-.43	.61	-4.12	.0001****
Cross-Country/Fitness	1.87	.52	2.34	.58	-.22	.56	-4.57	.0001****
School	2.01	.55	2.11	.55	-.54	.25	-.97	.34
Workshop skills	2.04	.68	2.49	.61	-.31	.54	-3.59	.001 ***

Note. Neither intervention cohort had begun the intervention at Time 1; both cohorts had completed the intervention at Time 3. T values are the results of paired t-tests. Df for these analyses were 1,31.

\*  $p \leq .05$ ; \*\*  $p \leq .01$ ; \*\*\*  $p \leq .001$ ; \*\*\*\*  $p \leq .0001$



Table 8

**Mean Running Times at Mid-Season and Season's End for all Athletes**

Variable	Cohort 1 ( <u>n</u> = 15)		Cohort 2 ( <u>n</u> = 12)		<u>LL</u>	<u>UL</u>	<u>t</u>	<u>d</u>	<u>p</u>
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>					
Meet 5	15.64	1.41	16.68	1.90	-2.35	.27	-1.64	.60	.12
Meet 9	15.58	1.75	16.87	2.04	-2.79	.21	-1.77	.68	.09
	Participants ( <u>n</u> = 27)		Non-participants ( <u>n</u> = 41)		<u>LL</u>	<u>UL</u>	<u>t</u>	<u>d</u>	<u>p</u>
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>					
Meet 9	16.15	1.96	15.65	1.45	-1.33	.33	-1.21	.25	.23

**Note.** Cohort 1 had completed the intervention, and Cohort 2 had not yet begun the intervention at Meet 5. All participants had completed the intervention at Meet 9. T values are the results of t-tests for independent samples. Df for analyses comparing Cohorts 1 and 2 were 1, 25; df for analyses comparing participants and non-participants were 1, 66.

Table 9

**Hierarchical Regression Predicting Meet 5 Cross-Country Time from Meet 2 Time and Intervention Cohort (n = 27)**

Variable	<u>B</u>	<u>SE B</u>	$\beta$	<u>t</u>	<u>p</u>
<b>Step 1</b>					
Meet 2 Time	.62	.04	.95	14.95	.0001
<b>Step 2</b>					
Meet 2 Time	.61	.04	.94	14.00	.0001
Cohort	.16	.22	.05	.72	.48

**Note.** Cohort 1 had completed the intervention, and Cohort 2 had not yet begun the intervention at the time of Meet 5. Cohort was coded 0 (Cohort 1), 1 (Cohort 2).

Table 10

**Hierarchical Regression Predicting Meet 9 Cross-Country Time from Meet 2 Time and Intervention Participation (n = 75)**

<b>Variable</b>	<b><u>B</u></b>	<b><u>SE B</u></b>	<b><math>\beta</math></b>	<b><u>t</u></b>	<b><u>p</u></b>
<b>Step 1</b>					
Meet 2 Time	.56	.04	.86	14.02	.0001
<b>Step 2</b>					
Meet 2 Time	.56	.04	.85	13.93	.0001
Intervention Participation	.23	.21	.07	1.08	.28

**Note.** Both intervention cohort groups had completed the intervention at the time of Meet 9.

Intervention participation was coded 1 (participants), 0 (non-participants).

Table 11

**Correlations Between Change in Self-Efficacy and Trait Anxiety Measures and Number of Completed Thought Logs**

	Number of Completed Thought Logs	
	r	p
Change in self-efficacy for workshop skills	-.10	.60
Change in self-efficacy for cross-country and physical fitness	.10	.57
Change in self-efficacy for body image	.22	.23
Change in self-efficacy for coping	-.14	.45
Change in trait anxiety	-.39	.03 *

**Note.** Change in self-efficacy and trait anxiety was computed by calculating the difference between Time 2 and Time 1 scores on these dependent measures. (At Time 1, neither cohort had begun the intervention. At Time 2, Cohort 1 had completed the intervention, and Cohort 2 had not yet begun the intervention.) Number of participants for these analyses was 32.

Mean number of thought logs completed by each participant was 12.72 (SD = 8.01).

\*  $p \leq .05$

Table 12

**Hierarchical Regression Analysis Predicting Change in Trait Anxiety from Number of Completed Thought Logs and Change in Self-Efficacy for Practicing Workshop Skills**  
**(N = 32)**

Variable	<u>B</u>	<u>SE B</u>	$\beta$	<u>t</u>	<u>p</u>
Step 1					
Time 1 trait anxiety	-.32	.13	-.43	-2.58	.02 *
Step 2					
Time 1 trait anxiety	-.26	.13	-.34	-2.03	.05 *
Number of completed thought logs	-.26	.15	-.29	-1.72	.10
Step 3					
Time 1 trait anxiety	-.25	.12	-.33	-2.11	.04 *
Number of completed thought logs	-.30	.14	-.33	-2.13	.04 *
Change in self-efficacy for workshop skills	-4.11	1.62	-.37	-2.54	.02 *

**Note.** Change in trait anxiety and self-efficacy was computed by calculating the difference between Time 2 and Time 1 scores on these dependent measures. (At Time 1, neither cohort had begun the intervention. At Time 2, Cohort 1 had completed the intervention, and Cohort 2 had not yet begun the intervention.) Mean number of thought logs completed by each participant was 12.72 (SD = 8.01).

\*  $p \leq .05$

## **DISCUSSION**

**“Thinking for Success”** was designed to enhance the experience of female adolescent athletes, in terms of their emotional well-being and their athletic performance. The literature on adolescence (Feldman & Elliott, 1990; Petersen et al., 1993; Petersen, Sarigiani, & Kennedy, 1991) suggests that the adolescent period is a chaotic time of development. Furthermore, it is suggested that adolescent girls find this time of their lives to be increasingly difficult, as compared to the experience of adolescent boys (Atwater, 1996; Benedict et al., 1981; Bush & Simmons, 1987; Compas et al., 1985; Covey & Feltz, 1991; Gotlib et al., 1993; Groer et al., 1992; Kandel & Davies, 1982; Newcombe et al., 1981; Peterson et al., 1993).

Regardless of gender, the period of adolescence is characterized by rapid physical and psychosocial change (Kurdek, 1987), in addition to “climatic” hormonal change (Davison & Susman, 2001). These hormonal and physical changes affect cognition, interpersonal interactions, behavior problems, and depression (Keating, 1990; Petersen et al., 1993; Petersen et al., 1991).

Some (Brooks-Gunn & Warren, 1989) have proposed that these changes have more impact on the lives of adolescent girls than on those of boys. Puberty usually has positive meaning for boys, because it makes them bigger and stronger (Petersen & Taylor, 1980), whereas pubertal change typically has some negative aspects for adolescent girls (Petersen, 1979), including an often unwelcome body shape and reproductive potential (Petersen et al., 1991).

In addition, girls begin menstruation earlier now than in previous eras, which results in girls entering adolescence earlier than they did 40 years ago (Pipher, 1994). Elevated

levels of depressed affect in girls have been linked to early pubertal hormone increases (Brooks-Gunn & Warren, 1989). Furthermore, experiencing simultaneous peak pubertal change prior to or simultaneous with school change has negative effects on affect during early adolescence (Petersen et al., 1991). Additionally, early developing girls have more problems with self-esteem and other areas relative to on-time or later developing girls (Tobin-Richards, Boxer, & Petersen, 1983).

Early development and the more difficult modern culture may further exacerbate the stressors imposed on adolescent girls. For example, the experience of progressing from a girl to a young woman is one that brings pressures and responsibilities that might feel overwhelming for someone who may still consider herself to be a young girl. In addition, worries related to feeling accepted by peers, being recognized as an outstanding athlete, having romantic relationships, excelling in school, and maintaining family relationships may have a cumulative stressful effect. The potential result can be an emotionally underdeveloped girl who is experiencing quite mature and adult-like concerns, but who may feel overwhelmed by the nature of such concerns.

Theorists (Beck, 1976; Ellis, 1962) have suggested that emotional reactions to experiences are related to the manner in which people think about and interpret events and/or situations in which they are involved. Adolescence is often a time in which one's thought patterns are unrealistic. Young and mid-adolescents are noticeably less skilled at generating options, looking at a situation from a variety of perspectives, anticipating the consequences of decisions, and evaluating the credibility of sources than are late adolescents (Keating, 1990). It is not uncommon for an adolescent to catastrophize or make grandiose conclusions about daily situations based on relatively little objective evidence. Due to their level of

cognitive development, young adolescents are not well-practiced in weighing relevant situational evidence and making a conclusion based on the objective evidence.

Furthermore, adolescents can make assumptions, which may be self-defeating in nature, based on their strong emotional reactions to the particular situation. Hormonal and other changes increase the emotional lability of adolescents. Such emotional lability can be experienced by the adolescent as both threatening and overwhelming. New and powerful emotions challenge the adolescent's emerging rationality, but it is on those same developing cognitive skills that the adolescent must rely to make sense of unexpectedly complex feelings (Keating, 1990).

Not only are feelings perceived as chaotic, but girls tend to lose perspective (Pipher, 1994), such that the level of emotion that an adolescent experiences further hinders her ability to think objectively about an event in which she is involved. **"Thinking for Success"** was intended to provide adolescent girls with the knowledge and skills needed to objectively evaluate, interpret, and challenge unrealistic thought patterns, by introducing them to basic cognitive theory and encouraging them to practice cognitive-restructuring skills. Such skills were designed to facilitate the girls' exploration of their thought patterns as they related to various areas of their lives, including school, relationships, self-perceptions, and athletic performance.

To assess the effectiveness of the **"Thinking for Success"** intervention, comparisons were made between intervention groups after the first cohort completed the intervention and prior to the second group beginning the intervention. Comparisons were made on psychological variables, which included depression, anxiety, loneliness, and self-esteem. Additional variables included girls' level of efficacy for: improving their body image,



engaging in close relationships, coping with life events, enhancing their cross-country and physical-fitness abilities, succeeding in school, and practicing skills taught in the intervention.

Results of these comparisons showed that the participants in the first cohort, who had completed their participation in the intervention, reported a significantly higher level of efficacy for coping, cross-country and physical-fitness abilities, practicing intervention skills, and improving their body image than their peers who had not yet begun participating in **“Thinking for Success.”** The data also suggested that there was a tendency for girls in the first cohort to report fewer symptoms of trait anxiety than the girls in the second intervention cohort. Furthermore, effect sizes for all but the differences on depression and on self-efficacy for close relationships were considered to be moderate or large. Overall, these findings indicated that participating in the intervention seemed to enhance the girls’ self-efficacy for dealing with a variety of concerns typical of adolescence.

Further analyses assessed change in the dependent measures over time. In these analyses, mean scores on the psychological variables at the pre- and post-intervention assessments were compared. All participants’ scores were included in these analyses, because all girls had completed the intervention at the time of the final assessment. Results from these analyses indicated that girls who participated in the intervention reported significant increases in their self-esteem and in levels of self-efficacy for coping, cross-country and physical-fitness abilities, practicing intervention skills, and improving their body image, in addition to significant decreases in state and trait anxiety. Similar to the effects noted in the first cohort subsequent to their participation in the intervention, it appeared that the intervention contributed to positive changes in the emotional experiences of its

participants. Perhaps participating in the workshop intervention contributed to the girls' perceptions that they were proactively influencing their emotional development, which may have contributed to positive effects on anxiety and on their self-esteem and self-confidence in being proactive in other areas of their lives.

In addition to improving the emotional well-being of its participants, **"Thinking for Success"** was also designed to improve participants' athletic performance. Literature in sport psychology suggests that cognitively-oriented interventions can positively influence the performance of athletes (Crocker, Alderman, & Smith, 1988; Hamilton & Fremouw, 1985; Kirschenbaum & Bale, 1980; Silva, 1982; Spinelli & Barrios, 1978; Suinn, 1972). Because the sample in this study was recruited from a cross-country team, the measure of athletic performance was girls' running times during the cross-country meets included in the analyses (i.e., Meets 2 through 9). Each event consisted of a two-mile run.

To determine whether **"Thinking for Success"** contributed to improvement in athletic performance, a regression analysis was performed after the first cohort had completed the intervention, which was prior to the second group's participation. The completion of the first group's intervention was consistent with the middle of the cross-country season. Hence, the analysis was performed on the running times of both intervention groups at the timed event that occurred just after the conclusion of the first cohort's intervention participation. Results from this analysis indicated that participating in the group who had already completed the intervention did not significantly predict one's athletic performance at the mid-season cross-country meet.

Further examination of athletic performance was conducted after all intervention participants had completed the intervention. The conclusion of the second cohort's

participation in the intervention was co-occurrent with the end of the cross-country season. The running times utilized for this analysis were those attained during the last cross-country meet of the season. Results from this analysis suggested that intervention participation was not a significant predictor of one's performance in the final meet of the cross-country season. Indeed, the mean running time for non-participants was faster than that for participants.

Taken together, the analyses of athletic performance indicated that participating in **"Thinking for Success"** did not have a significant impact on the girls' performance in their cross-country events. After examining the content of the thought logs, it appeared that the overwhelming majority concerned situations or events that were unrelated to the girls' athletic ability or performance. Perhaps the intervention failed to have an effect on athletic performance, because little monitoring and challenging of thoughts related to being an athlete was conducted by the girls.

Because athletic-performance data were provided for all members of the cross-country team, visual analyses of these data were performed. Mean running times for both intervention cohorts and non-participants were graphed for each timed event. Several trends were noted from this examination. The first intervention group was consistently faster than the non-participants, who were consistently faster than the second intervention group. This pattern was demonstrated at the beginning of the season and persisted throughout. It is possible that this trend can be explained by the distribution of varsity athletes in each group. As girls were randomly assigned to intervention group, more varsity athletes happened to be included in the first cohort. In fact, three of the fifteen participants in the first cohort (20%) were varsity athletes and, thus, tended to produce the quickest running times. Seven varsity athletes (of 48 non-participants; 14.6%) chose not to participate in the intervention, and none

of the twelve participants in the second cohort were varsity runners. Thus, it might have been the athletic performance of the varsity athletes that contributed to this trend.

Second, the athletic performance of all athletes improved from the beginning to the middle of the cross-country season, and all athletes experienced the most significant improvement at the second timed event (Meet 3) included in the analyses. At that time, the girls had been practicing and conditioning for one month. Thus, the noted improvement might be explained by the improvements expected by physical conditioning. Unfortunately, the intervention was not shown to positively influence athletic performance.

A final trend was noted in the athletic-performance data. With some exception, the athletic performance of all athletes tended to decline from the middle to the end of the cross-country season. Because I was able to personally interact with each girl during the course of the intervention, I observed that the girls placed increasing importance on qualifying for district and state meets at this time in the season. For example, it was not atypical for girls to talk with each other prior to the workshop meeting about who would be potential qualifying runners for these more competitive meets. Once the qualified athletes were named ( $n = 7$ ), perhaps non-qualifying athletes ( $n = 68$ ) tended to perceive their athletic performance as less important, thereby making less of a concerted effort to perform at their maximum ability levels.

After analyses of the intervention's effectiveness in improving psychological and athletic measures, follow-up analyses were conducted. These analyses were designed to assess whether significant intervention effects on outcome measures, as assessed after the completion of the first intervention group's participation, were a function of skills learned

during the intervention. The variables of interest for these analyses were the number of completed thought logs and the level of self-efficacy for practicing workshop skills.

After the first intervention cohort completed the intervention, significant cohort effects were found for the following variables: self-efficacy for improving body image, coping with life events, cross-country and physical-fitness abilities, and practicing workshop skills. Girls in the first cohort reported higher levels of efficacy in these areas of their lives than did their peers who had not yet participated in **“Thinking for Success.”** In addition, though nonsignificant, there was a tendency for lower trait anxiety scores in the participants who had completed the intervention, as compared to their counterparts who had not yet begun their participation.

Change scores for these variables were computed, in which pre-intervention scores were subtracted from scores obtained from all girls after the first group had completed the intervention. These change scores were correlated with number of completed thought logs to determine whether a significant relationship existed between level of self-efficacy and/or anxiety and the number of thought logs that participants completed.

Results indicated that a significant relationship existed between number of completed thought logs and change in trait anxiety, indicating that the more thought logs girls completed, the greater their decline in trait anxiety. This finding suggested that the lower level of trait anxiety reported by girls who had completed **“Thinking for Success”** was closely related to the number of thought logs completed by this group. Therefore, it appeared that engaging in a structured activity, in which girls were monitoring, evaluating, and challenging irrational thought patterns, had a positive effect on the level of anxiety experienced by these girls.

A final analysis was performed to examine additional predictors of trait anxiety. A regression analysis was conducted, predicting change in trait anxiety from number of completed thought logs and change in self-efficacy for practicing workshop skills. Change scores were obtained by subtracting pre-intervention scores from scores on measures after the first cohort had completed their intervention participation.

Results from this analysis indicated that both number of completed thought logs and change in self-efficacy for practicing workshop skills significantly predicted change in trait anxiety. Girls who completed thought logs and/or experienced increased levels of efficacy for practicing skills taught in **“Thinking for Success”** after completing the intervention were likely to experience a decline in their subjective experience of anxiety. Thus, not only was it important for girls to engage in a structured activity to evaluate and appropriately challenge unrealistic thought patterns, but they also needed to feel confident in their ability to do so, in order for them to experience reduced levels of anxiety.

Because the intervention included asking the girls to complete daily thought logs for four weeks after the conclusion of the workshop sessions, it was possible that a delayed cohort effect might have occurred. A final set of analyses was performed to test this possibility. Because the first intervention group had exposure to the skills taught in **“Thinking for Success”** for a longer period of time than did the girls in the second group, a delayed cohort effect might have been manifested, such that the first intervention group would have demonstrated significant improvement on at least one dependent measure even after the second group had completed the intervention.

Analyses detecting delayed cohort effects for both psychological and athletic-performance outcomes were performed. Analyses of both psychological and athletic data

indicated that a delayed cohort effect was non-existent. Girls who participated in the first intervention group did not experience improvement on any psychological or athletic-performance variable above and beyond what girls in the second intervention group experienced. Thus, it seemed to be irrelevant that one group of girls was exposed to the skills taught in **“Thinking for Success”** for a longer period of time. Rather, participating in the intervention, in and of itself, seemed to be the determining factor that contributed to any significant cohort effects.

#### Findings in Relation to Cognitive Research with Adolescents

**“Thinking for Success”** was effective in increasing participants’ levels of self-efficacy for coping, cross-country and physical-fitness abilities, practicing workshop skills, and improving body image. In addition, there was a nonsignificant yet suggestive finding that the intervention also contributed to reductions in trait anxiety. Though this study did not yield significant differences between groups on the depression, state anxiety, loneliness, and self-esteem measures, computation of effect sizes and power analyses indicated that a larger sample size would likely have yielded statistically significant differences between intervention cohorts.

Research on cognitive-restructuring interventions with adolescents has found that such interventions can decrease depressive symptoms (Butler et al., 1980; Marcotte & Baron, 1993), improve self-esteem (Butler et al., 1980; Nielsen et al., 1996), and reduce symptoms of test anxiety (Sud, 1993). When the findings of this study are considered in the context of research in this area, several hypotheses exist that might explain the discrepancy in research findings.

Of the literature reviewed, all of the studies utilized a workshop format, similar to **“Thinking for Success.”** However, the number of sessions included in the reviewed interventions generally included more than the two-session format of this study’s intervention. Studies in which depressive symptoms were reduced (Butler et al., 1980; Marcotte & Baron, 1993) and in which self-esteem was improved (Butler et al., 1980; Nielsen et al., 1996) included meeting for four to twelve sessions during the course of the intervention. It might have been that it was more beneficial for adolescents to engage in an intervention that included meeting over an extended period of time. Meeting for two sessions in this intervention might not have provided participants with enough opportunity to implement the cognitive-change techniques to positively influence their mood states.

Next, some of the studies reviewed in this area included larger sample sizes than the current study’s sample. While **“Thinking for Success”** included 32 participants, other research in the area has employed larger samples. An intervention (Butler et al., 1980) that was effective both in reducing depressive symptoms and in increasing self-esteem included 54 participants, while another intervention (Nielsen et al., 1996) that positively influenced self-esteem involved 85 participants. These sample sizes were quite a bit larger than the sample size utilized in this study ( $N = 32$ ).

Of the reviewed literature, the intervention that most closely resembled the format of **“Thinking for Success”** was one that was designed to reduce test anxiety (Sud, 1993). This intervention was a one-session workshop in which 30 participants were provided with didactic information regarding irrational beliefs and means in which one may recognize personal irrational beliefs. Sud’s (1993) program also incorporated a modeling component, similar to **“Thinking for Success.”** I, like Sud (1993), shared examples from my own life



that would be relevant to the lives of the participants in my study, as a means of providing examples of the application of cognitive-restructuring techniques. One component unique to Sud's (1993) intervention was the inclusion of exposure to anxiety-provoking stimuli; in this study, test situations. The intervention designed for the **"Thinking for Success"** program might have been more effective if a similar component were included in the workshop sessions. For example, perhaps imagining oneself preparing for, and competing in, a cross-country meet, while simultaneously engaging in a mental exercise of challenging one's irrational beliefs about that event, might have increased the effectiveness of my intervention. Other suggestions for improving this intervention in future studies will be discussed in a subsequent section of this paper.

#### Limitations

Although the intervention had a positive influence on girls' level of efficacy for performance in a variety of areas of their lives, and showed a trend towards decreased levels of trait anxiety, the intervention did not have a significant impact on other psychological variables (i.e., depression, self-esteem, loneliness). Nor did the intervention enhance girls' cross-country performance. In this section, potential reasons for the intervention's limited effectiveness will be discussed.

First, **"Thinking for Success"** was designed to occupy as little of the participants' time as possible. The intervention consisted of two hour-long workshop sessions. I believed that creating an intervention that produced minimal intrusions on the busy lives of these adolescent athletes would increase the likelihood that girls would choose to participate. As discussed in the previous section, two sessions might not have provided enough time for the

participants to fully comprehend the concepts involved and may not have prepared them adequately to apply the skills independent of the workshop setting.

A related concern involves the independent implementation of the thought-log process. Intervention participants were directed to complete one thought log daily for four weeks subsequent to the second workshop session. I considered meeting with each participant on a weekly basis to assess whether they were completing the logs, and to provide an opportunity to clarify any difficulties they encountered with the thought logs. However, such meetings would have increased the time demands on the participants. Instead, I chose to make weekly phone contact with each participant to monitor her progress and to provide any necessary instruction. Nonetheless, several participants did not complete the recommended number of thought logs (min = 2, max = 29). In order for the intervention to have a positive effect, it was necessary for participants to complete thought logs consistently. Because many participants did not adhere to this guideline, this may have weakened the intervention's impact.

An additional concern involves the number of girls who chose to participate in the intervention. Though some significant effects resulted from participating in **"Thinking for Success,"** it is possible that the intervention would have demonstrated more statistically significant effects if the sample size were larger. While the team from which participants were recruited consisted of 90 girls, only one-third of the team chose to participate. Results from power analyses indicated that a larger sample size (i.e., approximately 35 people per intervention group for most variables) likely would have yielded statistically significant differences between intervention groups.

A related concern involves potential self-selection of participants. It may have been the case that some characteristic of those who chose to participate differentiated them from those who did not. For example, perhaps those who tend to be anxious or fraught with worry found this intervention to be more appealing than did their less anxious teammates. Anxiety level is but one example. Thus, one should consider this study's findings with this consideration in mind.

Other limitations concern issues of measurement. First, all psychological measures relied on participants' self-report. Social desirability bias and demand characteristics may have been an issue, as participants may have been concerned with presenting themselves in a positive light and/or with pleasing me, as the intervention facilitator. Another measurement issue involves the self-efficacy measure designed for this study. Unlike the other measures of psychological variables, there currently exists no validity data on this measure. Finally, two measures of self-efficacy were single items. This was the case for self-efficacy for improving body image and for coping with daily life events. Thus, these measures do not measure the constructs with high reliability, and the findings involving these measures should be interpreted with caution.

### Future Studies

Should this intervention be implemented in future research endeavors, several suggestions are offered in an effort to improve its effectiveness. First, issues of social desirability are an issue with self-report measures. Therefore, it is recommended that a measure that screens for social desirability be included in future studies. In this way, one may determine whether demand characteristics were responsible for any reported improvement in psychological well-being.

A similar recommendation involves the inclusion of behavioral indices of improvement. For example, utilizing participants' school work and academic standing as additional outcome measures would provide behavioral support for participants' reported levels of efficacy for school work and academic concerns.

Because the intervention did not positively affect athletic performance, its focus on athletic performance should be intensified. As previously noted, the overwhelming majority of completed thought logs did not pertain to issues of athletic performance. Hence, it may not be surprising that athletic performance did not improve as a result of participating in this intervention. Perhaps, including a requirement that some thought logs are completed on a weekly basis that relate to one's athletic ability and/or performance would increase the likelihood of enhanced athletic performance.

Final recommendations concern ways in which the quality of the intervention could be enhanced. For example, it may have been the case that the examples used throughout the intervention were not of situations with which participants could easily identify. A measure soliciting information related to relevance of examples could be provided to participants upon completion of the intervention to gain more information about this possibility. Similarly, the quality of the intervention could be assessed by inquiring about participants' satisfaction ratings with the intervention. Examining whether participants' goals for the intervention had been met would provide useful data. Finally, observers could be employed to assess the quality of this intervention. Individuals with expertise in designing and implementing clinical intervention programs could review the content of the intervention to provide information useful for subsequent revision of the intervention material. If more data

on the quality of the intervention were available, subsequent findings could be considered in light of this information.

### **Implications**

The study results have implications for future directions of cognitive-change intervention research. To date, sport psychology research in which cognitive-restructuring methods have been employed have generally been implemented in individual meetings, in which each athlete meets individually with a counselor to evaluate and appropriately challenge self-defeating thought patterns. Such an arrangement seems to be most effective in working with athletes that are experiencing impaired performance on an individual level. However, individual sessions would be extremely time-consuming if one is working with an entire team. It seems that further research in applying cognitive-change techniques with athletes in a group format is needed, in order to appropriately evaluate the utilization of such methods with this population.

The second implication relates to the use of cognitive-change techniques with the adolescent population. As the results from this study demonstrated, cognitive restructuring positively influenced levels of self-efficacy for various areas of the lives of the sample's participants. This intervention was relatively time-limited, yet it contributed to enhancing the emotional well-being of its participants.

As adolescence is considered to be a transitional period in cognitive development (Keating, 1990), it seems that providing adolescents with skills to monitor and challenge irrational thought patterns would be especially beneficial during this transition. As the thought processes of adolescents are developing and becoming increasingly complex, it would likely be useful for them to be able to successfully employ cognitive-change

techniques to their evolving thought processes. Thus, further research implementing cognitive-change techniques with the adolescent population is strongly encouraged.

A final implication concerns using the school environment as a context for the implementation of cognitive-change methods. Incorporating the instruction of these techniques into the general school curriculum should be seriously considered, perhaps by including this material in the context of health class. Implementing cognitive-change methods into the curriculum might decrease the amount of emotional turmoil experienced during the adolescent period. Doing so would provide a context in which adolescents would evaluate their thought patterns in a supervised environment on a regular basis. Perhaps increased use of such techniques would prevent the adolescent period of development from being experienced as tumultuous as it has been historically considered.

# Appendix A

Last name of principal investigator Schilder <sup>72</sup>

## CHECKLIST FOR ATTACHMENTS: PLEASE CHECK ALL THAT ARE ATTACHED.

- ☒ Letter and/or posting form and/or telephone script used to solicit participants that clearly indicates:
  - a) purpose of the research
  - b) the use of any identifier codes (names, #'s), how they will be used, and when they will be removed (see item 13)
  - c) an estimate of time needed for participation in the research and the place
  - d) if applicable, location of the research activity
  - e) how you will ensure confidentiality
  - f) in a longitudinal study, note when and how you will contact participants later
  - g) participation is voluntary; nonparticipation will not affect evaluations of the participant
- ☒ Consent form, if applicable.
- ☒ Letter of approval for research from cooperating organizations or institutions, if applicable.
- ☒ Data gathering instruments

### 12. Anticipated dates for contact with participants:

First Contact 08/14/00  
Month/Day/Year

Last Contact 12/01/01  
Month/Day/Year

### 13. If applicable, anticipated date that identifiers will be removed from completed survey instruments and/or audio or visual tapes will be erased:

12/01/01

Month/Day/Year

### 14. Signature required for approval by the Department of Psychology:

*This research is within the guidelines established by the "Department of Psychology Ethical Principles and Policies Relevant to Research with Human Participants." I understand that it is my responsibility to ensure that all current and future researchers associated with this project are informed of the contents of the proposal and of the aforementioned guidelines.*

Kelly Schilder  
PI Signature

6.20.00  
Date

Proposal Approval Number \_\_\_\_\_  
(assigned by Department review committee)

### 15. Signature of Departmental Executive Officer

Date

Department or Administrative Unit

Craig Anderson

6/22/00

Psychology

### 16 Decision of the University Human Participants Review Committee:

X Project Approved

\_\_\_\_ Project Not Approved

\_\_\_\_ No Action Required

Patricia M. Keith  
Name of Committee Chairperson

6/29/00  
Date

PM Keith  
Signature of Committee Chairperson

Appendix B  
**INFORMED CONSENT**  
**"Thinking for Success"**

73

**Description**

"Thinking for Success" is a program designed to alter the way you currently think about important aspects of your life (e.g., sport performance, school, relationships) to a manner that may be more realistic given the particular situation or event. You will learn how to evaluate your current thoughts about situations that are important to you as well as to evaluate the accuracy of these thoughts and to create a more balanced way of thinking about these life events.

You are asked to participate in two one-hour workshops, located in your school, in which you will learn skills relevant to identifying and altering your current way of thinking. In addition, you will be asked to keep a daily thought log (this procedure will be explained in the workshops) for the next four weeks. This activity should only require 15-20 minutes of your time each day. Finally, you are asked to complete a series of short questionnaires about some of your thoughts and feelings. You will complete questionnaires prior to the first workshop, immediately upon completion of the second workshop, and approximately four weeks after workshop completion. You are encouraged to participate in all aspects of the "Thinking for Success" program in order to experience the maximum benefits of the program.

Due to limited capacity to run this program, "Thinking for Success" will be conducted twice. To determine in which group you will participate, you will be randomly assigned to one of two groups. (Group 1 will begin workshop participation in August, 2000, and Group 2 will begin in September, 2000.) Regardless of group assignment, you will receive the same information from these workshops as those participating in the other group.

**Purpose, Benefits, and Risks**

This experience is designed to teach you to identify and evaluate your current thinking style as well as to alter some thoughts as necessary to create a more balanced and realistic view of situations or events that are important to you.

You may experience multiple benefits from participating in "Thinking for Success". For example, this program has the potential to produce various types of changes, including improvements in athletic or academic performance, reduction in worry or disappointment about a particular situation or event, or change in behavior in specific situations. Such positive changes are all possible, but they may not occur for everyone. Your likelihood of experiencing such shifts greatly increases if you participate in all aspects of the "Thinking for Success" program.

This program is not designed to place you at any type of risk. However, it may be the case that thinking about your thinking or answering some questions about your thoughts and feelings may cause you some mild discomfort. If such discomfort occurs for you, please let me know. I will be happy to meet with you individually and evaluate the best way to remediate the situation for you.

**Participation and Confidentiality**

Your participation in "Thinking for Success" is strictly voluntary, and you may withdraw from this program at any time.

Once you agree to participate, you will be assigned an ID number. This number will be the only identifying information on your questionnaires as well as your thought logs. Thus, all of your responses and thoughts are completely confidential.

There are a few very infrequent exceptions to this policy. These include situations in which thoughts as noted in thought logs seriously give the impression that you (a) may cause harm to yourself or (b) may cause harm to someone else. In such situations, I am ethically and legally obligated to take necessary steps to protect and preserve the lives of those in danger, even if that means breaking confidentiality. All ID numbers will be removed once all information from this program has been reviewed and analyzed, which is estimated to be December, 2001.

**Contact Information**

I am a doctoral student in Counseling Psychology at Iowa State University and am conducting the "Thinking for Success" program as part of my dissertation research. At any time prior to or during your participation in this program, please do not hesitate to call or e-mail me with questions or concerns. I will be happy to talk with you in more detail about your concerns. My contact information is: Kelly K. Schilder, M.S. 294-0280 [schilder@iastate.edu](mailto:schilder@iastate.edu)

**MY PARENT/GUARDIAN AND I HAVE READ, UNDERSTOOD AND ACCEPTED THE POLICIES AND PROCEDURES FOR THE "THINKING FOR SUCCESS" PROGRAM DESCRIBED ABOVE.**

\_\_\_\_\_  
Student signature \_\_\_\_\_ Parent/Guardian signature \_\_\_\_\_ date



## APPENDIX C

### Thinking for Success Workshop 1

#### Workshop Introduction

- Hand out workshop materials; oversee participants' assignment of ID numbers; document residential information.
- What is **"Thinking for Success"**? Changing current thinking to more realistic thinking. It is not:
  - Kidding yourself into believing something that isn't true. Instead, you will learn to evaluate the accuracy of your current thoughts and alter them to be more in line with the reality of the situation.
  - Just learning positive thinking. Positive thinking only accounts for information that is optimistic. Instead, you will learn to weigh the facts—positive and negative—to create a more balanced way of thinking about the situation.
- How?: This workshop will teach you how to identify your thoughts, especially those that may involve ways that you think about stressful situations. You will be taught how to keep track of your thoughts every day (will only take 15-20 minutes each day). You will learn how to change your current thinking into a more balanced way of viewing the situation that is particularly important to you.
- Why: Doing so can enhance performance in sports:
  - increasing free-throw accuracy in college basketball players (Hamilton & Fremouw, 1985; Silva, 1982)
  - reducing fouls committed in college basketball (Silva, 1982)
  - enhancing volleyball performance (Crocker, Alderman, & Smith, 1988)
  - enhancing golf performance (Kirschenbaum & Bale, 1980)
  - reducing penalty time in hockey (Silva, 1982)
  - enhancing performance in track athletes (Spinelli & Barrios, 1978; Suinn, 1972)
- Monitoring unhelpful thoughts helps athletes to worry less, which allows them to maintain the optimal level of energy needed to perform successfully in their sport (Burton, 1988; Gould, Petlichkoff, Simons, & Vevera, 1987; Sonstroem & Bernardo, 1982).
- **Question:** How many of you have found yourselves worrying or thinking about your performance prior to your cross-country event? This is very common in sports and happens to most athletes at some point in their athletic career, even professional athletes.
- Worrying or thinking unrealistically about a situation may contribute to being less successful in sport (Morgan, 1985).
- This process can also help athletes to become more motivated, increase their concentration, and increase their level of confidence, all of which have been

shown to contribute to increased athletic as well as academic performance (Holm, Beckwith, Ehde, & Tinius, 1996).

- **Question:** How many of you have ever gotten nervous before taking a test? This is also common.
- The main purpose of this workshop is to help you examine and alter those thoughts that are not working for you. It is my hope that doing so will help you to feel less stressed about a certain situation when you begin to think about it in a more balanced manner.
- So, changing bothersome thoughts can potentially help you in cross-country, at school, and in other important situations (e.g., relationships) of which you are a part.
- **Who?:** Adolescent girls involved in high school athletics, because:
  - We don't know as much about female athletes as we do about male athletes, so I was particularly interested in devoting attention to girls.
  - We know that, unfortunately, adolescence is more challenging for girls than boys. For example, adolescent girls report more unhappiness, emotional distress, and shame than do adolescent boys (Covey & Feltz, 1991).
  - I hope that this workshop will minimize the chances that you all will experience, or continue to experience, similar feelings of unhappiness, stress, or worry.
  - Because your whole team is not involved in tonight's workshop, I ask that you not share what you have learned tonight with those teammates who are not here. They will also participate in the same workshops, but will do so in a couple of weeks. In order for me to see how effective this program is, it is very important that you not share what you have learned with your other teammates. Does anybody have any questions or concerns about this?
  - To give you an idea as to how groups were selected, because of limited availability to conduct this program, each member of your team was randomly assigned to participate in one of two workshop series.
- **When?:** Two workshops
  - The first is tonight. You will complete some questionnaires that ask you about some of your thoughts and feelings. You will then learn the skills and tools necessary to "think for success." As part of this program, you will practice keeping track of your thoughts every day for the next five weeks. This week will be considered the "practice" week after which we will get together to check in on the use of these skills.
  - The second workshop will be in one week. You may notice that you run across some problems or questions as you implement the skills you will learn today. At our next meeting, you will have the opportunity to have your questions answered as well as to review the concepts you will learn today. You will also fill out similar questionnaires to those you complete today.
  - Four weeks after our second workshop, we will get together briefly so you can complete the same questionnaires. These questionnaire measures are used to help me determine how effective this program is.
  - To be eligible for the Younker's gift certificates, you must attend both workshops, complete your thought-tracking records (i.e., thought logs), and complete all three rounds of the questionnaire measures. Your name will be entered in a lottery

drawing for a \$50 gift certificate to Younker's department store. (Each group of girls is eligible in one drawing, so there are two total lottery drawings.) The drawing will take place at the same meeting as the final round of questionnaires, and the winners will be given the gift certificates then.

- **Questionnaires:** Each participant will complete the first round of paper-and-pencil measures about their thoughts and feelings.
- **ACTIVITY:** As whole group. I'm going to give you an example of a situation that I experienced in high school. Think about and write down what your first thought may have been in this situation? What feelings coincide with the thoughts that you had?
  - **Example:** When I was a junior in high school, I was advanced from an average junior-level math course into an Honors course in Calculus. I was intimidated by the other students in the class, because many of them were seniors. The teacher relied heavily on class participation in the way she structured the course. On one occasion, I was confident in my answer to the question that she posed to the class. I looked around and no one else was raising their hand. I began to wonder if the question was as easy as I had thought. If I knew the answer, how come nobody else did?
  - What are some thoughts you had in this situation? Some thoughts that I had included: I'm not as smart as the other students, I guess I don't know what the teacher is talking about, I'm not good enough to be in this class. What are some feelings that go along with each of these thoughts?
- ◆ **Explanation of activity:** In any situation, there are many ways to think about what the event means, which is why we were able to come up with so many different thoughts that I may have had in just one situation. What is interesting is that the interpretations that we make of any situation, not the situation itself, are what determine our feelings and overall mood.
- ◆ **Explanation of Automatic Thoughts (ATs):** ATs are the thoughts that pop into our heads automatically throughout the day. We are often unaware that we are having these thoughts, but instead may recognize the mood that is triggered in us by a certain event or situation. For example, those thoughts that we identified as the "first thoughts" that came to mind in the Calculus class situation are ATs. ATs can be words ("I'm going to fail this test") or images (laboring over difficult math test). To identify ATs, imagine that you have a mini tape recorder in your mind. If you had a tape recording your thoughts all of the time, pretend that you're replaying the tape of all the thoughts you were saying to yourself in certain situations, especially those situations in which you're feeling stressed or down. This is similar to what I did when I recalled the thoughts I had in my Calculus class. The more we pay attention to our thoughts, the easier it is to identify those thoughts that are tied to our feelings or mood in the specific situation.
- ◆ **We've identified several thoughts that I may have had in my Calculus class.** You may realize that one thought seems to be more powerful than the others, in terms

of its believability or your emotional reaction. Those thoughts that seem to carry emotional “power” are known as power thoughts (PTs).

- ◆ **Explanation of Power Thoughts (PTs):** Power thoughts are automatic thoughts that are most connected to our mood, or the way that we *feel* about a certain situation. When we are feeling stressed out, worried, or disappointed about a situation, it is important for us to identify which AT is causing us to feel this way. (In the example I gave you, I really felt doubtful about my intellectual ability in math. The thought that seemed to cause this feeling of doubt was that I wasn’t smart enough to be in this class.) Once we identify the AT that is causing our reaction (i.e., the power thought), we next examine its accuracy and may change this thought, so that we may improve the way that we feel about the situation or event. We will use our thought logs to guide us in this process.
- **Thought logs:** You will find these located in your packet of materials. This activity will walk you through the steps involved in identifying your thoughts and resulting mood as well as weighing the evidence that does/does not support your thought, which will help you to create a more realistic thought that pertains to your situation or event. (Refer to **Thought Log** worksheets.)
- **ACTIVITY:** Divide into 3 small groups. Each group will receive a written scenario. After one group member reads the scenario, each person is to complete the Situation, Mood (how you were feeling in this situation), and AT (at least 3 thoughts) columns of their thought logs. A designated note-taker will write at least one thought per group member down on flip-chart.
  - **Situation 1:** One of your friends is interested in joining the cross-country team. You have been a member of this team for years. You have been really excited about her involvement on the team for the past couple of weeks. However, you two have not been getting along well the past couple of days, which includes arguing with each other. When you show up to the team’s initial meeting for the season, you find her whispering to the teammates to whom you feel closest. What is the first thought that comes to your mind as you see her interacting with them? How might you feel in this situation?
  - **Situation 2:** You are at a cross-country team meeting. As your coach prepares your team for a big meet that is coming up this weekend, you become aware that there is some pretty intense competition in the other runners (both at your school and the competing schools) who are participating in your event. You have been questioning your performance in the past couple of meets, because you feel like your times have been just awful. In addition, you notice that your teammates have been consistently improving in their performance during these most recent meets. You are concerned about how you will perform in this next meet. What is the first thought that comes to your mind? How might you feel in this situation?
- ◆ **Groups will reconvene into larger group.** Group note-taker will share their scenario and their small group’s generated thoughts and feelings.

- To identify your power thought—the thought that resulted in your emotional reaction/mood—think about how you were feeling in the cross-country example that your group discussed. You’ve written down how you felt in each situation in the Mood column of your thought log. Now, we need to figure out which AT caused us to feel this way. To do this, I want you to rate each AT in terms of its emotional “power” (i.e., 1 represents “hardly causes this feeling” to 5 for “almost entirely causes this feeling”). The thought ranked with the highest number is most likely the PT. If none of the ATs appear to cause the way we were feeling, refer to **Worksheet 1 – How to Spot an Automatic Thought** to help identify other thoughts that could be contributing to the way you feel about the situation.
- In order for us to feel better about the situation, the next step is to list all of the **facts**, not assumptions, that support the power thought that we’ve identified in the AT column. Write down information that supports your PT in the Supporting Evidence column of your thought log.
- The key is to consider your power thought as a *guess* as to what is actually occurring in this situation, so we are going to list evidence that does not support your power thought in the Contradictory Evidence column. It is especially important to list facts that challenge our hot thoughts, because we tend to dwell on only the evidence that supports our belief. This is usually not useful, though, because sometimes our thinking can make us feel worse than we actually need to about a given situation. Weighing the evidence both for and against our thought will help us to think more realistically and, ultimately, to feel better and worry less. You may notice changes in your mood even as you list evidence that counters your thoughts. To help you challenge your thought, use **Worksheet 2 – How to Challenge a Power Thought**.
- Creating a balanced thought. The next step is to change your power thought (which may not be entirely true) to a more balanced way of thinking about the situation. (They may either create a new thought that seems to be more consistent with the evidence they’ve listed in your thought log, or they can follow the steps listed on **Worksheet 3 – How to Create a Balanced Thought**.) It is important to remember that balanced thinking is not just thinking positively, because this new way of thinking considers both sides of the evidence, not just the positives. Ask yourself if you believe this new, more balanced thought. If you do, you’re ready to move on! If not, try creating another thought that may be more believable to you. (You may use **Worksheet 3** to help you do this.)
- After you create a more balanced thought about your situation, make note of the changes you observe in your athletic or academic performance, mood, worries, stress, and/or feelings. Do you notice any changes in your behavior? Do you feel differently, or have a different reaction than you did before? Do you think differently about the situation? After you have created a believable balanced thought, note the changes you observe in the Observations column of your thought log.
- **ASSIGNMENT:** I’m interested in seeing what keeping track of your thinking does for you in helping the way you feel, think, and behave in different areas of your life. Now that you’ve learned how to use a thought log, your task is to complete a thought log every day for the next week (until we meet again). Each thought log should include at least one situation you encountered that day, but you are not limited to just

one. You may find that it is most helpful to carry your log with you, jotting down thoughts as they occur, and working through the other columns of the worksheet when you have time later in the day, perhaps when you have some quiet time at home that evening.

- **NEXT WORKSHOP:** We will meet again next week. As you practice tracking your thinking, you may realize that you have some questions. Please bring any questions to ask me next time. If you have questions early in the week, feel free to e-mail or call me.
- Brief time for questions before ending Workshop 1

## Thinking for Success Workshop 2

- Open forum for discussing questions regarding assignment of tracking thoughts from last workshop
- **ACTIVITY:** Whole group.
  - Facilitator will present the following thoughts one at a time:
    - ❖ “I just ran into my romantic partner in the middle of the hallway between class periods. I’m pretty sure that he/she saw me, but he/she didn’t even take the time to stop and talk to me. He/She must really be mad at me. I wonder what I did to upset him/her?”
    - ❖ “I just got my first math test back. I thought I knew what I was doing, but I guess I was wrong, because I got a “C-“ on it. My parents are going to kill me! I only have two more tests left to try to raise my grade. I just know I’m going to flunk this class!”
  - Each participant is to imagine that her best friend offered these thoughts to her. What questions might you ask of this person to challenge their thinking, or to help this person create contradictory evidence for the thoughts? I want you to use this activity as a reference when you are brainstorming contradictory evidence for your own thoughts, which is often more difficult to do.
- **ACTIVITY:** Have group divide into pairs. You will help each other to identify power thoughts and combat them.
  - Using a **Thought Log** worksheet, each participant will complete the Situation, Mood, Automatic Thoughts, and Supporting Evidence columns for the situation presented. With their partners, they may work on brainstorming evidence that does not support their power thought, which will be listed in the Contradictory Evidence column. Individually, they may then complete the thought log for each scenario (create balanced thought, note changes in mood, etc.). This activity is designed to assist each participant in finding evidence that does not support her immediate thought. It is often easier for an objective person to find such evidence; therefore working in pairs may assist in this process.
  - **Situation 1:** It’s the beginning of cross-country season, and the weather seems to be hotter and more humid than usual. Although you have practice today, you are not very excited about running in this heat. It’s very tempting to tell Coach that you won’t be able to attend practice today. What are some thoughts that you’re having in this situation? What might you be feeling?
  - **Situation 2:** Each person will generate a potentially stressful situation. This situation may involve athletic performance, academic performance,

specific worries, relationship conflicts, or other relevant scenario. What are you thinking and feeling in this situation? What is your partner thinking and feeling in this situation?

- Open forum for questions on tracking thoughts.
- **Questionnaires:** Participants will complete the second round of paper-and-pencil measures about their thoughts and mood.
- **ASSIGNMENT:** Once questions have been answered and participants seem to have a grasp on using the thought logs, purpose, etc., each girl will keep a daily thought log for the next 4 weeks. (Each thought log should include at least one situation, but not limited to just one.) I will be available by phone or e-mail should any questions arise in the process. I will have a drop box located in the main office of their school in which participants may drop off thought logs one day per week.
- **Follow-up Questionnaires:** The group will briefly meet in 4 weeks to complete the final round of questionnaire measures (upon completion of 4 weeks of tracking and altering unrealistic thinking).
- **Gift Certificate Drawing:** The lottery drawing for a \$50 gift certificate to a local department store will take place at the final assessment meeting and will be distributed to two participants then.
- **Workshop results:** Those who are interested in the results of this workshop's effectiveness are encouraged to provide me with their address. Once results are analyzed, I will be happy to provide interested persons with a copy of the results.



## **How to Spot an Automatic Thought**

### **Worksheet 1**

1. It is the first thought that comes to your mind.
2. It is usually negative.
3. It feels like the truth.

## **How to Challenge a Power Thought**

### **Worksheet 2**

1. When I have felt this way before, what did I think about that made me feel better?
2. Has anything happened to me that shows that this thought is not always true?
3. Am I jumping to conclusions that are not based on the facts?
4. If my best friend was thinking this way, what would he/she say to me?
5. If my best friend had this thought, what would I tell him/her to make him/her feel better?

## **How to Create a Balanced Thought**

### **Worksheet 3**

1. Based on the facts that I have listed in my thought log, is there another way to think this situation?
2. Can someone I trust think about this situation differently?
3. If someone that I cared about had this thought, what would I say to him/her? How would I help them to explain the situation?

## Thought Log

Situation	Mood(s)	Automatic Thoughts	Supporting Evidence	Contradictory Evidence	Balanced Thought	Observations
<b>Who with?</b> <b>Where?</b> <b>When?</b> <b>What were you doing?</b>	<b>Name the feeling.</b> <b>See Feelings Worksheet.</b>	<b>See Worksheet 1.</b> <b>Rank thoughts 1-5 to determine "power" thought.</b>	<b>What are the facts that support your power thought?</b>	<b>See Worksheet 2.</b>	<b>See Worksheet 3.</b>	<b>Changes in behavior?</b> <b>Worries?</b> <b>Mood?</b>

**APPENDIX D**  
**DEPENDENT VARIABLES AND MEASURES**

<b>Dependent Variable</b>	<b>Measure</b>
Depression	Depression Adjective Checklist, Form A (Lubin, 1965)
Self-Esteem	Rosenberg Self-Esteem Scale (Rosenberg, 1965)
Self-efficacy for adolescent-athlete concerns (i.e., coping, improving body image, cross-country and physical-fitness abilities, school, close relationships, practicing workshop skills)	Self-Beliefs Questionnaire (created by Schilder for this study)
Anxiety (i.e., state anxiety, trait anxiety)	State-Trait Anxiety Inventory, Form Y (Spielberger, 1983)
Loneliness	UCLA Loneliness Scale, Version 3 (Russell, 1994)
Athletic performance	Running time in cross-country meet(s)

## APPENDIX E INTERVENTION TIMELINE

<b>Date</b>	<b>Cohort 1</b>	<b>Cohort 2</b>
8/14/00	Full assessment	Full assessment
8/17/00 – 8/19/00	Workshop #1	
8/22/00 – 8/24/00	Workshop #2 Self-efficacy assessment	
9/25/00	Full assessment	Full assessment
9/25/00 – 9/28/00		Workshop #1
10/2/00 – 10/4/00		Workshop #2 Self-efficacy assessment
11/6/00	Full assessment	Full assessment

Note. Full assessment included measures of depression, anxiety, loneliness, self-esteem, and self-efficacy for adolescent-athlete concerns. Self-efficacy assessment included only the measure of self-efficacy for adolescent-athlete concerns.

## **APPENDIX F MEASURES**

ID \_\_\_\_\_

### **ROSENBERG PERSONAL OPINION SURVEY**

- 1 = Strongly agree  
2 = Agree  
3 = Disagree  
4 = Strongly disagree

- \_\_\_\_\_ 1. I feel that I'm a person of worth, at least on an equal plane with others.
- \_\_\_\_\_ 2. I feel that I have a number of good qualities.
- \_\_\_\_\_ 3. All in all, I am inclined to feel that I am a failure.
- \_\_\_\_\_ 4. I am able to do things as well as most other people.
- \_\_\_\_\_ 5. I feel I do not have much to be proud of.
- \_\_\_\_\_ 6. I take a positive attitude toward myself.
- \_\_\_\_\_ 7. On the whole, I am satisfied with myself.
- \_\_\_\_\_ 8. I wish I could have more respect for myself.
- \_\_\_\_\_ 9. I certainly feel useless at times.
- \_\_\_\_\_ 10. At times I think I am no good at all.

**SELF-BELIEFS SCALE**

**DIRECTIONS:** Respond to each of the following questions, using the scale below, in terms of what is true for you concerning **THE NEXT TWO WEEKS**.

0 = Not at all confident  
1 = Somewhat confident  
2 = Moderately confident  
3 = Very confident

1. \_\_\_\_\_ How confident are you that you will complete and hand in your homework on time?
2. \_\_\_\_\_ How confident are you that you will do well in your most difficult class?
3. \_\_\_\_\_ How confident are you that you will feel self-assured before taking tests in your hardest class?
4. \_\_\_\_\_ How confident are you that you will be satisfied with your body's shape?
5. \_\_\_\_\_ How confident are you that your cross-country times will improve?
6. \_\_\_\_\_ How confident are you that you will successfully solve conflicts in your personal relationships?
7. \_\_\_\_\_ How confident are you that you will be a good friend to those who are close to you?
8. \_\_\_\_\_ How confident are you that you will get along well with your parents?
9. \_\_\_\_\_ How confident are you that you will improve in your overall level of physical fitness this year?
10. \_\_\_\_\_ How confident are you that you will improve in cross-country performance this year?
11. \_\_\_\_\_ How confident are you that you will not be excessively nervous prior to running your next cross-country event?
12. \_\_\_\_\_ How confident are you that you will be satisfied with your cross-country time at your next meet?
13. \_\_\_\_\_ How confident are you that you will be able to identify your negative thoughts?
14. \_\_\_\_\_ How confident are you that you will be able to challenge at least one of your negative beliefs?
15. \_\_\_\_\_ How confident are you that you will be able to counter some of your negative thoughts with more balanced, positive thoughts?



16. \_\_\_\_ How confident are you that you will be able to handle the stresses that face you at this time of year?
17. \_\_\_\_ How confident are you that you will be able to develop more balanced thoughts that help you feel less worried about stressful situations in your life?
- 

**Note.** Self-efficacy for body image is assessed by item 4. Self-efficacy for effectiveness in close relationships is measured by items 6, 7, and 8 (subscale alpha = 0.83.) Self-efficacy for coping and managing stress is assessed using item 16. Self-efficacy for cross-country and physical-fitness abilities is measured with items 5, 9, 10, 11, and 12 (subscale alpha = 0.75.) Self-efficacy for managing schoolwork is assessed by items 1, 2, and 3 (subscale alpha = 0.66.) Self-efficacy for practicing workshop skills is measured by items 13, 14, 15, and 17 (subscale alpha = 0.88.) Alpha coefficients could not be computed for body image and coping subscales, as each was represented by one item.

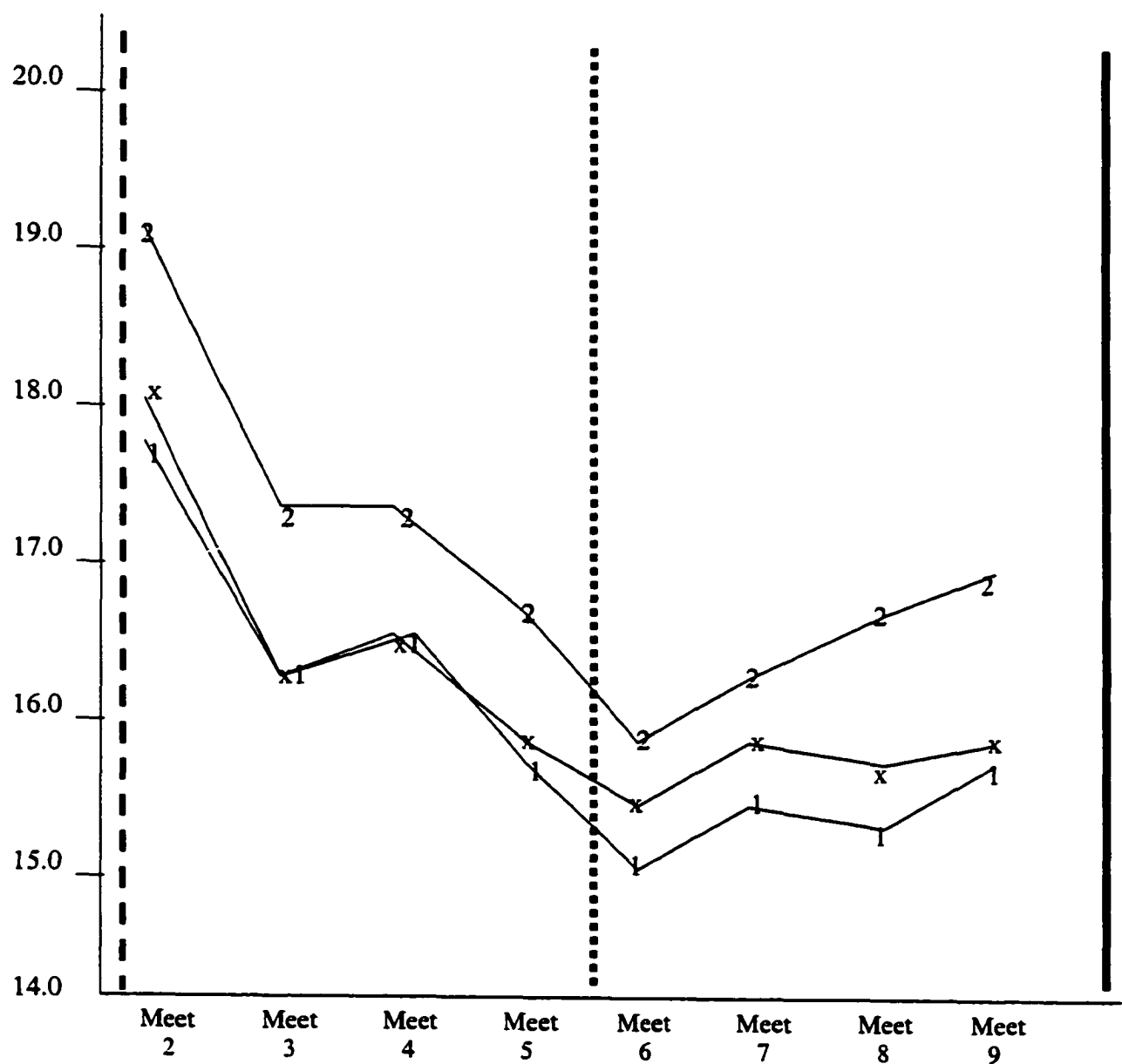
**UCLA SCALE**




**DIRECTIONS:** The following statements describe how people sometimes feel. For each statement, please indicate how often you feel the way described by writing a number from the following scale in the space provided.

- 1 = Never  
 2 = Sometimes  
 3 = Much of the time  
 4 = Always

1. How often do you feel that you are "in tune" with the people around you? \_\_\_\_\_
2. How often do you feel that you lack companionship? \_\_\_\_\_
3. How often do you feel that there is no one you can turn to? \_\_\_\_\_
4. How often do you feel alone? \_\_\_\_\_
5. How often do you feel part of a group of friends? \_\_\_\_\_
6. How often do you feel that you have a lot in common with the people around you? \_\_\_\_\_
7. How often do you feel that you are no longer close to anyone? \_\_\_\_\_
8. How often do you feel that your interests and ideas are not shared by those around you? \_\_\_\_\_
9. How often do you feel outgoing and friendly? \_\_\_\_\_
10. How often do you feel close to people? \_\_\_\_\_
11. How often do you feel left out? \_\_\_\_\_
12. How often do you feel that your relationships with others are not meaningful? \_\_\_\_\_
13. How often do you feel that no one really knows you well? \_\_\_\_\_
14. How often do you feel isolated from others? \_\_\_\_\_
15. How often do you feel you can find companionship when you want it? \_\_\_\_\_
16. How often do you feel that there are people who really understand you? \_\_\_\_\_
17. How often do you feel shy? \_\_\_\_\_
18. How often do you feel that people are around you but not with you? \_\_\_\_\_
19. How often do you feel that there are people you can talk to? \_\_\_\_\_
20. How often do you feel that there are people you can turn to? \_\_\_\_\_

# **APPENDIX G** **MEAN CROSS-COUNTRY TIMES PER GROUP**



**Note.** Plots denoted with “1” represent mean running times for Cohort 1, “2” represent mean running times for Cohort 2, and “x” represent times for intervention non-participants.  indicates the beginning of Cohort 1’s intervention.  marks the co-occurrent beginning and ending of Cohort 1’s and Cohort 2’s intervention, respectively.  indicates the ending of Cohort 2’s intervention.

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