Postmarathon Affect in First-time and Experienced Marathon Participants: An Exploratory Investigation

Douglas M. Hankes
University of North Texas

Running Head: Postmarathon Depression

Abstract

Anecdotal reports have suggested that some runners, especially first-time participants, experience a mood disturbance following the completion of a marathon. This postmarathon depression has also been reported to occur weeks and even months after the race. Therefore, the present investigation compared first-time (N=64) and experienced (N=63) marathoners and two control groups, aerobic exercisers (N=64) and sedentary individuals (N=59) on several affect measures over a 6 month period following completion of a marathon. Subjects completed the Beck Depression Inventory (BDI), the Tellegen Positive and Negative Affect Schedule (PANAS), a modified Profile of Mood States (POMS), and the Social Readjustment Scale (SRS) approximately 1 week before the marathon and 2 weeks, 2 months, 4 months, and 6 months after the completion of the 1990 Dallas White Rock Marathon. The data from the dependent measures were analyzed by a 4 X 5 (Group X Time) MANOVA. Overall, both marathon groups and the aerobic exercise group had significantly more positive psychological profiles in comparison to the sedentary group. Results indicated that the first-time and experienced marathon groups did not differ on any of the affect measures. Anecdotal reports of postmarathon depression were not substantiated by the present study.

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In recent years, the psychology of the marathon and long-distance running has gained the attention of researchers in both psychology and exercise. Though the running explosion of the late 1970s has leveled off, there are still an estimated 7 million American adults who run and meet the American College of Sports Medicine's (ACSM) recommendations for the frequency, duration, and intensity of exercise to maintain minimal physical fitness (Olsen, 1986). These requirements are for 3-5 exercise bouts per week for approximately 30 minutes at approximately 50-85% of maximum oxygen uptake (American College of Sports Medicine, 1979).

In the early years of the running boom, many runners caught up in the euphoria of the boom participated in marathons and races in record numbers. The beginning of the 1980s brought a decline in marathon participation as many runners either sought moderation or alternate activities after this period of overracing and training. However, TACSTATS, the official record keeper of running, has detected an upward trend in the marathon. Recent surveys have found a renewed interest in racing the marathon as runners appear to miss the sense of accomplishment that comes from completing the distance (Higdon, 1988). Much of running's popularity is that it requires little skill or the gaining of new motor coordinations in order to participate. An individual must only remember what one did as a

child. It is possible for even the neophyte runner to successfully complete the 26 miles and 385 yards after as little as 6 months of training. The possibility of achieving this seemingly overwhelming task in such a brief time period appears to be a factor in the number of individuals who attempt the marathon (Sacks, 1981).

The beneficial physiological aspects of physical exercise have been well-documented in the research literature, ranging from increased cardiovascular adaptation and efficiency (Clausen, 1977; Fox & Haskell, 1978), increased lean body mass and high-density lipoproteins (Barnard, Weber, Weingarten, Bennett, & Pritikin, 1981), care of obstructive pulmonary disease (Atkins, Kaplan, Timms, Reinsch, & Lofback, 1984), obesity prevention and treatment (American College of Sports Medicine, 1983), prevention of hypertension (Seals & Hagberg, 1984), and modified cardiovascular risk profiles in healthy people (Martin & Dubbert, 1982).

Researchers have also focused their attention on the effect regular exercise has on mental health and psychological well-being. There exists a large body of literature supporting the benefit of exercise on psychological well-being in such areas as: decreased Type A behavior patterns (Blumenthal, Williams, Williams, & Wallace, 1980), reduced effects of life stress events (Roth & Holmes, 1987), improved cognitive processes (Tomporowski & Ellis, 1986), reduction of anxiety (Jones & Weinhouse, 1979), improved self-concept (Tucker, 1983), and

decreased depression (Hanaford, Harrell, & Cox, 1988; Ewing, Scott, Mendez, & McBride, 1984).

Not only has exercise been shown to improve psychological well-being, it has been used as a therapeutic intervention for psychological problems (e.g., Berger, 1984; Browman, 1981; Johnsgard, 1990; Ledwidge, 1980; Weinstein & Meyers, 1983; Morgan & Goldston, 1987; Sachs & Buffone, 1984). In the most comprehensive literature review to date, Doan and Scherman (1987) compared pre-experimental, quasi-experimental, and experimental research to determine the effect of physical fitness in the areas of self-concept, mood, anxiety and depression. They concluded that the literature supports the potential efficacy of physical fitness programs in the treatment of personality disorders related to self-concept, mood, anxiety and depression. Seventy-seven percent of the quasi-experimental and experimental studies in which cardiovascular gains were documented indicated improvement on the psychological measures in question. Doan and Scherman (1987) suggest that these results behoove the mental health profession to consider the efficacy of exercise as a psychological intervention.

In particular, running has been the most utilized mode of exercise as both an adjunct to therapy and as a treatment itself. Freemont and Craighead (1987) examined the separate and combined effects of cognitive therapy and aerobic exercise (running) for the treatment of individuals experiencing difficulties coping with dysphoric moods. All

treatment conditions produced significant but not differential improvement. A four-month follow-up indicated that the improvement had been maintained which lends support for the association of physical fitness and a beneficial therapeutic effect

It has been argued that running becomes a "positive addiction" because of the psychological benefits that the individual may accrue through participation (Glasser, 1976). However, Morgan (1979) has warned that running for some individuals may become a negative addiction. Individuals who suffer from a negative addiction to running are driven by a compulsive need to run at least once a day. They run even when injured and often neglect the responsibilities of work, home, and family. The symptoms of negative addiction are most likely to be found in runners who are highly committed. Summers, Machin, and Sargent (1983), using Carmack and Marten's (1979) Commitment to Running scale, found partial support for that contention finding that marathon runners who reported higher commitment also reported more negative consequences of running.

For most individuals, however, it seems that the positive aspects of participation in physical exercise (particularly running) far outweigh the potential hazards. When individuals conscientiously maintain consistent training regimes, they are usually able to see and feel their physical and mental improvements. Currently, social and medical support is readily available to reinforce those who regularly exercise. Given this atmosphere and the minimal amount of skill required in

running, it is not hard to imagine why a new runner might gradually come to consider participation in a marathon.

Though research interest in marathon and long distance running has increased, it has primarily focused on only two facets: the cognitive strategies used by those individuals who do complete the marathon and the reasons why individuals run marathons. The first facet addresses what the individual thinks about during the marathon. In particular, research has focused on whether runners associate (maintain awareness of their body and physical factors critical to performance) or disassociate (purposely cut themselves off from sensory feedback that would normally be available from the body during a run). Masters and Lambert (1989) found that association was preferred by 93.75% of their marathon runners. This contradicts earlier theory that suggested that elite runners characteristically associate, while non-elite runners tend to disassociate (Morgan & Pollock, 1977). Masters & Lambert (1989) also found that the more an individual expressed competitive drive as a reason for running, the more those runners associated while running a marathon. This was a consistent finding regardless of ability level.

In addressing the second facet, demographic information has been gathered in several studies at different marathons that is primarily descriptive in nature, addressing cognitions prior to and immediately after the marathon. There is a great diversity in the motives for running a marathon. Summers et al. (1983) reported that runners

gave 41 specific reasons for running a marathon with the six most common being goal achievement, test of personal worth, physical health, others' influence, curiosity, and enjoyment. Personal achievement and self-satisfaction were the two most frequently perceived outcomes for running in a marathon. Nearly 70% of the respondents also reported that they had had gains in personal insight. Summer, Machin, Levey, & Murray (1982) in looking at first time marathon participants found that the majority of the runners saw the marathon as a challenge or test of both their physical and psychological capabilities. Summer et al. (1982) further asserted that overcoming the challenge produced feelings of deep personal awareness and increased self-image that extended beyond the event itself. Many runners also perceived that other's attitudes toward them changed in a positive direction.

Currently, there is no research that has followed what happens cognitively, affectively, or behaviorally to runners after they have attempted their first marathon. Summers et al. (1982) had first time marathon participants complete a post-questionnaire approximately 1 week after completing the marathon. Given the brief amount of time allowed to pass prior to completing the post-questionnaire, their conclusion that running in a marathon was an extremely positive experience may have been made too quickly. Summers et al. (1983) had their subjects complete a postrace questionnaire as soon as possible following the marathon. The three most frequently cited

perceived outcomes from running a marathon were increased self-confidence, increased knowledge of self, and increased body control. Immediately following the race, 89% of first-time marathon runners stated that they would likely run another marathon. However, postrace questionnaires answered immediately after the marathon may not allow for the full and accurate range of affect and cognitions to be expressed.

Personal experience and anecdotal reports suggest that a first marathon is not always the fulfilling experience that it is often portrayed to be (Bessone, 1986). In running circles, many have had contact with individuals suffering from the "marathoning blues." These are the runners who did not thrive on their first marathon experience. Jeff Galloway, a 1972 Olympic team member and a current running coach, noted that postmarathon depression was not uncommon, and that the severity of the affect disturbance appears to be positively correlated with the importance of the race (Galloway, 1987). Galloway also noted that not enough has been written about postmarathon depression. Several reasons have been suggested to account for those individuals who experience a change in affect and the often subsequent inconsistent, unenjoyable, or discontinuation of participation in running. These include: pushing too hard in training, unfamiliararity with the mental stress accompanying the physical pain, setting unrealistic goals, and disillusionment upon reaching a goal (Bessone, 1986). The insidious factor of this condition is that it

often does not appear until weeks or months after the marathon (Bessone, 1986).

Thus, the major purpose of the present investigation is to determine whether first time participants in a marathon suffer from an increase in affective disturbance, especially depression or dysphoric mood as compared to more experienced runners who have run more than one marathon and two control groups. One control group consisted of individuals who exercised enough to meet ACSM guidelines to maintain minimal fitness. The second control group consisted of sedentary individuals. Unlike previous investigations where marathon participants were questioned immediately after the race, these runners will be followed for a 6 month time period after the marathon. If there is found to be a significant increase in affective disturbance, depression, or dysphoric mood following participation in a marathon, then a second purpose of the study was to determine what psychological and physiological variables contribute to this phenomenon. The lack of previous research in this area does not allow a clear prediction for specific hypotheses. Therefore, the present investigation must be considered as primarily exploratory in nature.

Method

Subjects

Marathon subjects were recruited from entrants in a large marathon (26.2 miles) race in the Southwest, the 1990 Dallas White Rock Marathon. Pre-registration race forms did not indicate whether runners had or had not participated in previous marathons. Therefore, it was not possible to mail questionnaires to a random sample. Subjects were recruited in one of two ways. First, some subjects were recruited via an announcement in a running column of a local newspaper. The remainder of the marathon subjects were recruited by approaching runners as they picked up their race packets in the week prior to the marathon. Research packets containing an informed consent (see Appendix 1) were either mailed to subjects in the week prior to the marathon or distributed at the pre-registration race headquarters.

Initially, 175 marathon runners agreed to participate as subjects after the longitudinal nature of the study was explained. Fully completed premarathon questionnaire packets were returned by 140 marathon runners. Of this group, 127 marathon runners, experienced (N=63) and first-time (N=64), completed the questionnaires at all five times of measurement. The data from these 127 runners were utilized in the statistical analyses. Subjects were not limited by age or gender.

Subjects in the two control groups, consistent aerobic exercisers meeting ACSM guidelines for minimal fitness (N=65) and sedentary individuals (N=59) were recruited from the faculty, staff, and students of a large university in the Southwest.

Instruments

The prerace questionnaire consisted of two parts. The first part requested general demographic information and a running history (see Appendix 2). The running history contained specific questions about the individual's training for the marathon, performance expectations or goals, and reasons for running.

The second part of the questionnaire was comprised of instruments that assess various aspects of psychological well-being and affect/mood. These self report instruments were chosen for their sound psychometric properties. The Commitment to Running scale (Carmack & Martens, 1979) was used to assess addiction to running (see Appendix 3). Summers et al. (1983) found the scale to be a viable measure of running addiction. The Masters-Ogles Marathon Scale (Masters & Ogles, 1990) was given to measure the self-report motivations of marathon runners (see Appendix 4). This measure has nine subscales which include: health orientation, self-esteem, personal striving, weight concern, psychological coping, life meaning, social recognition, socialization, and competition. The Beck Depression Inventory (Beck & Steer, 1987) was used as a sensitive measure of

syndrome depression (see Appendix 5). The Positive and Negative Affect Schedule, a relatively new scale, was used to measure two distinctive dimensions (Watson, Clark, & Tellegen, 1988). Positive Affect reflects the extent that a person feels enthusiastic, active, and alert. Negative Affect reflects a general dimension of subjective distress and unpleasurable engagement (see Appendix 6). Smith, Smoll, and Schutz (1990) have developed a short form of the Profile of Mood States (McNair, Lorr, & Droppleman, 1971). This instrument was used to assess mood fluctuations (see Appendix 7). The six POMS subscales and their description include: tension-anxiety (somatic tension), depression-dejection (feelings of personal inadequacy), anger-hostility (feelings of overt anger), vigor-activity (mood of high energy), fatigue-inertia (mood of weariness and low energy), and confusion-bewilderment (cognitive inefficiency). Finally, the Social Readjustment Rating scale (Holmes & Rahe, 1975) was given in an attempt to verify other stressful life factors which might affect scores on the other measures in a confounding manner (see Appendix 8).

The postrace questionnaire consisted of two parts. The first part dealt with immediate prerace illnesses or injuries and medical problems which might occur during and after the race. Part 1 also included a questionnaire which tracked the runners' training and exercise patterns following the race. The second part of the postrace questionnaire included the Commitment to Running scale, the Masters-Ogles Marathon Scale, the Beck Depression Inventory, the Positive and

Negative Affect Schedule, the Profile of Mood States, and the Social Readjustment Rating Scale. Actual performance in the race was collected from the official race results.

Non-marathon subjects in the two control groups answered the questionnaires associated with psychological well-being and mood/affect. These subjects also answered a brief questionnaire addressing exercise patterns during the 6 month time period.

Procedure

Prerace questionnaires, including stamped return envelopes, were distributed approximately 1 week prior to the marathon. Subjects were asked to complete the prerace questionnaires immediately and return the questionnaires via the stamped return envelopes. Separate postrace questionnaires were sent at four different time periods after completion of the marathon. The four separate mail outs were chosen to insure a maximum of respondents. It was thought that while a single packet of postrace questionnaires would ensure that subjects received all of the materials, it would decrease response rate as the time intervals after the races increased. These time intervals were at 2 weeks, 2 months, 4 months, and 6 months after participation in the marathon. Anecdotal reports have suggested that postmarathon depression does not always occur immediately after participation in the marathon, but may not fully manifest itself until months after the race (Bessone, 1986). Therefore, four different time intervals were selected in the tracking of the dependent measures assessing

psychological well-being and affect/mood. Subjects were again asked to complete the questionnaires immediately and return the questionnaires via the enclosed stamped return envelopes.

Non-marathon subjects in the ACSM minimal aerobic exercise group and the sedentary group completed the same questionnaires related to psychological well-being and affect/mood. These subjects also completed a brief questionnaire assessing exercise patterns (or lack of) during the previous 3 months. A limitation of the present investigation was that it did not completely standardize the time period in which the questionnaires were completed.

Results

Premarathon Demographic and Training Variables

Descriptive statistics were gathered on a number of demographic and training variables for the marathon participants (see Table 1 for means and standard deviations). A series of one-way ANOVAs conducted on the demographic and training variables revealed both similarities and differences between the two marathon groups. Alpha levels were set at .01 in order to minimize the possiblity of Type 1 error. Results revealed that experienced marathoners had been running for a longer time period than the first-time marathoners (10.4 years versus 6.7 years), $F(1,118)=8.88$, $p< .003$. First-time marathoners' average training pace (M=8:29) was slower than the experienced marathoners (M=8:01), $F(1,118)=7.94$, $p< .006$. In

addition, experienced marathoners had run approximately 4.5 previous marathons prior to the present marathon.

Data more specific to training for the present marathon and expectations about their marathon performance also indicated similarities and differences. There was not a significant difference between the two marathon groups in their average weekly mileage for the 3 months prior to the marathon (first-timers-36.5 miles, experienced-39.9 miles). There was also not a significant difference in the two marathon groups' average weekly long run for the 2 months prior to the marathon (first-timers-15.4 miles, experienced-14.8 miles). Subjects were asked several questions about their perceptions and expectations regarding the marathon. On a 7-point Likert scale with response choices ranging from 1 (completely unprepared) to 7 (completely prepared), subjects were asked how well they thought they had prepared for the marathon. First-time marathoners (M-5.3) thought they were better prepared than experienced marathoners (M-4.7), $F(1,118)=7.55$, $p<.007$. A second question asked the marathon subjects how difficult they anticipated it would be to complete the marathon, with responses ranging from very hard (1) to very easy (7). First-time marathoners (M-3.5) anticipated the marathon to be more difficult to complete than the experienced marathoners (M-4.2), $F(1,118)=6.70$, $p<.01$. Finally, a question was asked whether the runners expected to "hit the wall" during the race with the scale anchored with the items certain I will (1) to certain I

won't (7). First-time marathoners (M=3.4) were significantly more likely to expect to "hit the wall" than experienced marathoners (M=4.0), $F(1,118)=3.9$, $p<.01$.

The experienced marathoner subjects (3:35) set significantly lower time goals than first-time the first-time marathon subjects (4:01), $F(1,118)=19.7$, $p<.001$. A question asking how certain subjects were that they could reach their stated goal revealed no significant differences, with the scale anchored with not certain at all (1) to absolutely certain (7), (first-timers=5.1, experienced=4.7). Prior to the present marathon, experienced marathoners' average personal best time for the marathon was 3:33.

The Masters-Ogles Marathon Scale (MOMS) was given to measure the self-report motivations of the marathon runners (see Table 2 for means and standard deviations on the nine scales). Results indicated that the two marathon groups were similar in their motivations for running a marathon as the overall MANOVA was not significant across the nine scales.

A commitment to running index (the CRS) was computed by summing 12 questions with 5-point Likert scales that asked the runners to rate their general feelings about running. There was not a significant difference between experienced (49.8) and first-time (47.9) marathoners on the Commitment to Running Scale (CRS). Scores for the CRS may range from 12 to 60 with 60 representing the highest possible amount of commitment. The scores of the experienced and

first-time marathoners indicate a level of commtiment which is associated with running addiction (Carmack & Martens, 1979).

Descriptive statistics were also gathered for the two control groups, consistent aerobic exercisers and sedentary individuals. By definition, the sedentary group did not participate in regular aerobic exercise. The exercise groups' average weekly number of exercise bouts ranged from 3.2 to 3.6 days per week over the 6 month testing period. Their average workout length ranged from 45.0 minutes to 49.8 minutes per exercise bout during the 6 month testing period.

Psychological Factors

Initially, the data from the dependent measure scores from the Beck Depression Inventory (BDI), the Positive and Negative Affect Schedule (PANAS), the Profile of Mood States (POMS), and the Social Readjustment Scale (SRS) were analyzed by a 4 X 5 (Group X Trials) repeated measures multivariate analysis of Variance (MANOVA). Results indicated a significant main effect for both group, $F(3, 233)=2.32$, $p < .001$ and trials, $F(3, 233)=4.62$, $p < .001$. Similarly, the Group X Trials interaction was significant, $F(3, 233)=1.99$, $p < .001$. Therefore, univariate ANOVAs were used to further investigate the interactive effect by comparing the four groups for each of the dependent measures at each time of measurement. Means and standard deviations for each of the dependent (affect) measures are presented in Tables 3-7.

The SRS was utilized to measure stressful life events which might have occurred during the 6 months of the study and therefore influenced self-report on the affect measures. There were no significant differences between the four groups on the SRS at any of the five times of measurement. Means and standard deviations on the SRS may also be found in Tables 3-7.

An overall consistent pattern emerged from the follow-up ANOVAs. There was not a single significant difference found between the first-time and experienced marathon groups on any of the affect measures (BDI, PA, NA, or POMS) at any of the different times of measurement (pre-marathon, 2 weeks postmarathon, 2 months postmarathon, 4 months postmarathon, or 6 months postmarathon). In general, the follow-up ANOVAs indicated that the two marathon groups scored significantly higher on the positive psychological factors and lower on the negative psychological factors in comparison to the sedentary control group. This finding also mostly occurred when comparing the aerobic exercise control group to the sedentary control group. The differences and similarities in affect were more mixed when comparing the marathon groups and the aerobic exercise group. Each of the findings for the specific dependent measures will be briefly described.

The first-time and experienced marathon groups, as well as the aerobic exercise group, scored significantly lower on the BDI than the the sedentary group at premarathon, $F(3, 247) = 5.99$, $p < .001$. 2 weeks

postmarathon, $F(3, 247) = 10.24$, $p < .001$, and 2 months postmarathon. No significant differences were found at 4 or 6 months postmarathon.

On the positive affect (PA) scale of the PANAS, the same results were found at all five times of measurement. Specifically, both marathon groups and the aerobic exercise group reported significantly higher positive affect than the sedentary group. Results for each of the five times of measurement were as follows: premarathon, $F(3, 247) = 11.75$, $p < .001$; 2 weeks postmarathon, $F(3, 247) = 6.30$, $p < .0004$; 2 months postmarathon, $F(3, 247) = 4.65$, $p < .003$; 4 months postmarathon, $F(3, 247) = 7.00$, $p < .001$; 6 months postmarathon, $F(3, 247) = 8.81$, $p < .001$.

At the pre-marathon and 4 and 6 months postmarathon, there were no significant differences between the groups on negative affect (NA) of the PANAS. However, at 2 weeks postmarathon, $F(3,247) = 14.13$, $p < .001$ and 2 months postmarathon, $F(3, 247) = 7.16$, $p < .001$, the two marathon groups were reporting less negative affect than the aerobic exercise and sedentary control groups.

The marathon groups and the aerobic exercise group reported significantly greater vigor on that POMS subscale than the sedentary group at all five times of measurement. Results for each of the five times of measurement were as follows: premarathon, $F(3, 247) = 17.50$, $p < .001$; 2 weeks postmarathon, $F(3, 247) = 7.71$, $p < .001$; 2 months postmarathon, $F(3, 247) = 6.78$, $p < .001$; 4 months postmarathon, $F(3, 247) = 4.85$, $p < .002$; 6 months postmarathon, $F(3, 247) = 8.28$,

$p < .001$.

Both marathon groups scored significantly lower on the depression subscale of the POMS than either the exercise or sedentary control groups at premarathon, $F(3, 247) = 5.23$, $p < .001$ and 2 weeks postmarathon, $F(3, 247) = 8.04$, $p < .001$. There were no differences in the groups at 2, 4, or 6 months postmarathon.

On the anxiety subscale of the POMS, both marathon groups scored significantly lower than the two control groups at premarathon, $F(3, 247) = 7.49$, $p < .001$ and 2 weeks postmarathon, $F(3, 247) = 11.05$, $p < .001$. No significant differences were found between the groups on the final three measurement times.

At pre-marathon, $F(3, 247) = 6.04$, $p < .001$, 2 months postmarathon, $F(3, 247) = 3.50$, $p < .01$, and 4 months postmarathon, $F(3, 247) = 3.79$, $p < .01$, both marathon groups and the aerobic exercise group reported significantly less fatigue than the sedentary control group. There were no significant differences at 2 weeks and 2 months postmarathon. And finally, there was not a consistent pattern of results on the tension or confusion subscales of the POMS.

The various affect measures were also analyzed using a polynomial trend analysis to test for linear, quadratic, cubic, and quartic trends. While there were sporadic significant F-tests indicating trends, there was not any consistency in the trends, and the specific results will not be reported.

Due to the exploratory nature of the investigation and the lack of differences found between the first-time and experienced marathoners as groups, a frequency distribution was utilized using the sole clinical dependent measure, the BDI. Table 8 illustrates the percentages of each group scoring within the ranges suggested by Beck (1967) as general guidelines when using the BDI. These ranges are: 1) 0 to 9 are considered to be within the normal range or asymptomatic; 2) 10 to 18 indicate mild-moderate depression; 3) 19-29 indicate moderate-severe depression; and 4) 30-63 indicate extremely severe depression.

Using the BDI score at the pre-marathon measurement as the baseline score, first-time marathoners who scored greater than the baseline BDI score and whose score was greater than 15 were selected out to compare against the other groups. Oliver and Simmons (1984) suggest that within normal populations BDI scores greater than 15 may detect possible depression, although a clinical interview is critical for confirmation. No first-time marathoners met this criteria at the 2 week postmarathon measurement. At 2, 4, and 6 months postmarathon, only one first-time marathoner at each time of measurement met this criteria. Therefore, further analysis was not merited.

Postmarathon Descriptive Variables

A series of one-way ANOVAs were conducted on postmarathon variables. More stringent alpha levels ($p < .01$) were adopted in order

to minimize Type 1 error. The results of the one-way ANOVAs revealed similarities and differences in the first-time and experienced marathoners. Experienced marathoners (3:43) ran the marathon significantly faster than the first-time marathoners (4:06), $F(3, 247)=12.00$, $p < .001$. The marathoners did not differ in their satisfaction with their times in the marathon (first-timers= 5.2, experienced=4.9). The time satisfaction question was anchored with completely dissatisfied (1) to completely satisfied (7). The marathon groups also did not differ in their perception of the difficulty in completing the marathon. First-time (4.4) and experienced (4.0) marathoners expressed equal difficulty on a question ranging from very easy (1) to very hard (7). On a question regarding whether the time and energy spent training for the marathon justified the benefits, first-time marathoners ($M=6.4$) were significantly more satisfied than experienced marathoners ($M=5.9$), $F(3, 247)=4.70$, $p < .01$ with the question anchored with (1) absolutely did not and (7) absolutely did. Two weeks after the race, marathoners did not differ in their feelings about their recovery from the marathon (first-timers=4.9, experienced=5.1) on a question anchored by (1) much slower recovery and (7) much faster recovery.

At 2, 4, and 6 months postmarathon, first-time and experienced marathoners did not differ significantly on questions about general happiness with their running. Potential responses to the question ranged from (1) not happy to (7) very happy. On the running

happiness question, scores across time were 4.1, 4.3, and 4.3 for first-timers and 4.3, 4.4, and 4.6 for experienced marathoners. Similarly, the marathon groups did not differ on how they reported they felt overall mentally and physically. This question was anchored by the responses (1) tired and stale to (7) rested and refreshed. For the general mental-physical feeling question, scores across time were 4.8, 4.5, and 4.6 for first-time marathoners and 4.6, 4.7, and 4.7 for experienced marathoners.

A 2 X 4 (Group X Trial) MANOVA was conducted on postmarathon training for the first-time and experienced marathoners using the number of days run and the number of miles run as dependent variables. Means and standard deviations can be seen in Table 9. The overall MANOVA was not significant indicating that the two marathon groups were similar in their physical training after the marathon.

Discussion

The results of the present study do not appear to support anecdotal reports by runners that postmarathon depression or "marathoning blues" exists as a significantly occurring phenomenon. In fact, the results add to the body of literature supporting the psychological benefits of chronic exercise. Both first-time and experienced marathoners and the aerobic exercise control group had a significantly more positive psychological profile over the 6 month testing period than the sedentary control group. The lack of significant differences on the SRS between the four groups indicates that no individual

groups' affect measurements were being unduly influenced by stressful life events. Therefore, the overall positive affect of the three groups (first-time and experienced marathoners and aerobic exercise control group) engaged in exercise as compared to the sedentary control group would seem to be associated with exercise.

The marathon subjects in the present investigation compare favorably to other studies involving marathon runners in terms of the runners' characteristics including age, years running, training miles, goal time for the marathon, and motivation for running a marathon (e.g. Masters & Lambert, 1989; Masters & Ogles, 1990; Okwumabua, 1985; Summers et al., 1982; Summers et al., 1983; Tharion, Strowman, & Rauch, 1988). For example, on the MOMS, the two marathon groups when compared to subjects in the Masters and Ogles (1990) study reveal virtually the identical rank ordering of mean per item score on each of the nine factors. Therefore, it would be unlikely that the two present marathon groups represent an aberrant sampling of marathoners on the chosen affect measurements.

Though there were some statistical differences in the first-time and experienced marathoner groups regarding descriptive variables, overall, the two groups were remarkably similar to one another. In particular, the 6.7 years of previous running experience of the first-time marathoners indicate that although they were first-time marathon participants, they were not neophyte runners, but rather a group of experienced runners with a pattern of commitment to the

activity of running. The similar postmarathon training of the first-time and experienced marathoners also lends credence to that assertion.

The sole clinical measurement utilized in this study was the BDI and was therefore an important test for indication of depressive symptomology. A perusal of Table 8 reveals the small percentage of marathoners who scored greater than 9, a score indicating mild-moderate depression, on the BDI. When a slightly more stringent criteria of greater than 15 on the BDI as recommended for use with normal populations is used (Oliver & Simmons, 1984), then the the number of marathoners scoring this high is virtually eliminated in the two groups. At least with this clinical measurement, it would appear that postmarathon depression does not occur in a sizeable number of runners to warrant concern.

It should be noted that an expectancy or lie scale to detect individuals who "fake good" was not utilized in this study. Many of the marathoners returned questionnaires and wrote in a comment section available to them that the survey seemed overly negative. This comment was made especially in regard to the BDI. The BDI consists of 21 groups of statements with four possible selections. Three of the statements are clearly negatively focused while the remaining statement is merely the absence of a negative factor. There is not a positive or healthy statement that can be chosen. There is the possibility that marathoners might be incorporating a self-protection

factor in disclaiming any affect disturbance or depression. In order to offset their perception of the questionnaire as being negatively focused, the marathoners may have biased their answers toward those items that were less negative.

Both marathon groups scored high in commitment to running as proposed by (Martens & Carmack, 1979). Given the amount of time invested in training for the marathon, these runners might have some reason to deny any negative consequences associated with the training and running of a marathon. It has also been suggested that marathoners may be running away from other problems, and that the tranquilizing effect of exercise allows them to ignore other very real life difficulties (Bayless, 1990). Similarly, Rudy & Estok (1990) and Barrell, Chamberlain, Evans, & Holt (1989) have noted a complex relationship existing between desired level of involvement and what is achieved within the constraints of family and work commitments. A self-serving bias ignoring problems associated with training for and running a marathon might explain the lack of affect disturbance as measured by self-report. Family members and significant others might be able to offer an alternative perspective in describing the effects of running a marathon.

Results of the present investigation help provide a better understanding of marathon runners and specifically their affect following participation in a marathon. Marathoners represent a select group of individuals who exhibit the discipline and focus to pursue a

physical goal involving stress and fatigue beyond the normal range of fitness experience. Therefore, they are a select population offering unique opportunities regarding research. Several problems including a potential self-serving bias on the part of the marathon groups and a negative appearing self-report instrument (the BDI) have been noted in the present exploratory investigation and modifications addressing those problems are warranted in order to clarify results.

Further research might follow several avenues. Pistacchio, Weinberg, & Jackson (1989) attempted to develop a psychobiologic profile of individuals who experience and do not experience exercise related mood enhancement. Individuals completing a marathon might serve as a more extreme group on the exercise adherence continuum and who consistently experience improved affect. Researchers studying affect changes during the months of training prior to the marathon race might be revealing in comparison to affect after the marathon. Any research continuing to locate postmarathon depression would benefit from the addition of measures besides self-report instruments. Families and significant others might be able to provide a more accurate judgement of affect in the marathon runners. And finally, the motivations and commitment of marathoners to exercise should continue to be studied, especially as it might relate to those unable to adhere to fitness programs.

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Table 1

Means and standard deviations for premarathon demographic and training variables

	First-time		Experienced	
	M	SD	M	SD
Age	35.6	6.4	38.0	7.2
Years of running	6.7	5.8	10.4	7.7
Training pace (sec)	509.2	53.0	481.0	56.6
(min)	8:29		8:01	
Weekly mileage	36.5	11.2	39.9	14.7
Average long run	15.4	4.1	14.8	4.0
Marathon goal (min)	240.5	30.2	215.6	31.2
CRS	47.9	6.0	49.8	5.6

Table 2

Rank orderings of mean per item score on MOMS

First-time marathoners

SE	PS	HO	WC	SOC	PC	SR	LM	COMP
4.7	4.4	4.0	3.3	3.1	2.9	2.9	2.9	2.3

Experienced marathoners

SE	PS	HO	WC	PC	SOC	LM	SR	COMP
4.9	4.9	4.3	3.7	3.3	3.3	3.3	3.2	2.9

Note: SE=Self-esteem; PS=Personal Striving; HO=Health Orientation; WC=Weight Control; PC=Psychological Coping; LM=Life Meaning; SOC=Socialization; SR=Social Recognition; COMP=Competition with Others

Table 3

Means and standard deviations for BDI, PANAS, POMS, and SRS at pre-marathon time of measurement

	Group							
	First-time (n=64)		Experienced (n=63)		Exercise (n=65)		Sedentary (n=59)	
	M	SD	M	SD	M	SD	M	SD
BDI	4.0	4.3	4.8	5.6	5.5	5.0	7.8	5.7
PA	38.4	5.4	36.8	6.0	35.2	5.4	32.6	5.7
NA	17.4	6.8	18.4	6.7	20.4	7.4	20.7	7.8
V	10.6	2.9	9.6	3.1	9.0	2.7	6.9	3.2
A	2.2	2.9	2.4	3.0	3.5	2.7	4.3	2.6
T	4.8	3.5	5.0	3.6	4.8	3.5	5.5	3.5
F	3.4	2.7	4.3	3.7	4.3	3.0	5.9	4.1
C	3.4	5.6	2.6	2.7	4.4	3.7	5.7	4.0
D	1.7	2.4	1.9	2.9	2.9	2.7	3.4	3.2
SRS	108.1	78.4	106.1	78.4	105.6	13.1	93.1	12.1

Table 4

Means and standard deviations for BDI, PANAS, POMS, and SRS at 2 weeks postmarathon time of measurement

	Group							
	First-time (n=64)		Experienced (n=63)		Exercise (n=65)		Sedentary (n=59)	
	M	SD	M	SD	M	SD	M	SD
BDI	2.5	3.0	3.9	5.0	5.2	5.9	7.5	6.5
PA	36.0	7.3	34.4	6.9	34.8	6.8	30.7	6.9
NA	14.4	5.2	14.4	4.2	18.7	7.7	20.4	7.7
V	9.1	3.2	8.9	3.8	8.8	3.6	6.4	3.5
A	1.6	2.4	2.2	2.5	4.0	3.5	4.1	3.2
T	2.7	2.4	2.5	2.3	4.9	3.8	5.3	3.3
F	3.9	4.5	3.9	3.4	4.5	3.4	5.4	3.7
C	2.1	2.6	2.3	2.2	4.4	3.8	5.0	3.5
D	1.3	2.0	1.5	2.8	3.1	3.4	3.1	3.2
SRS	80.0	62.5	72.2	60.8	107.0	98.8	89.4	72.6

Table 5

Means and standard deviations for BDI, PANAS, POMS, and SRS at 2 months postmarathon time of measurement

	Group							
	First-time (n=64)		Experienced (n=63)		Exercise (n=65)		Sedentary (n=59)	
	M	SD	M	SD	M	SD	M	SD
BDI	3.5	5.4	3.7	4.8	5.1	6.0	7.2	7.0
PA	35.2	7.7	35.4	8.0	35.0	6.8	31.2	6.0
NA	15.5	7.2	15.3	6.3	18.6	7.2	20.2	7.5
V	9.5	3.1	9.2	3.6	8.9	3.2	7.0	3.3
A	2.4	3.5	2.6	3.3	3.5	3.0	4.8	3.6
T	3.2	3.3	3.2	3.3	4.6	3.1	5.5	3.7
F	3.5	3.1	3.7	3.7	4.2	3.1	5.4	4.1
C	2.9	3.1	2.5	2.7	3.9	3.6	5.3	3.9
D	2.3	3.2	1.7	2.6	2.8	3.0	3.4	3.3
SRS	72.6	65.3	75.2	74.0	81.2	78.9	88.8	75.3

Table 6

Means and standard deviations for BDI, PANAS, POMS, and SRS at 4 months postmarathon time of measurement

	Group							
	First-time (n=64)		Experienced (n=63)		Exercise (n=65)		Sedentary (n=59)	
	M	SD	M	SD	M	SD	M	SD
BDI	3.6	3.8	5.2	6.8	5.3	6.0	6.4	6.9
PA	34.6	6.8	36.1	7.0	35.1	6.7	30.9	6.2
NA	17.1	6.3	18.3	7.4	18.7	7.2	20.3	7.9
V	9.5	3.3	9.1	4.1	9.0	3.3	7.3	3.1
A	3.1	3.2	2.4	3.0	3.6	3.1	3.8	3.3
T	3.5	2.6	4.3	3.3	4.4	3.4	5.7	3.9
F	3.9	3.6	4.4	3.8	4.1	2.9	5.9	3.9
C	3.0	2.8	3.9	6.9	3.9	3.4	5.3	3.6
D	2.1	2.3	1.6	2.3	2.7	2.8	3.1	3.4
SRS	93.7	95.7	96.0	76.8	89.5	79.8	80.4	73.9

Table 7

Means and standard deviations for BDI, PANAS, POMS, and SRS at 6 months postmarathon time of measurement

	Group							
	First-time (n=64)		Experienced (n=63)		Exercise (n=65)		Sedentary (n=59)	
	M	SD	M	SD	M	SD	M	SD
BDI	3.4	3.2	3.8	4.8	4.8	5.1	6.1	7.2
PA	35.0	7.8	36.4	6.1	34.7	6.6	30.4	6.5
NA	16.9	6.1	16.8	5.8	18.0	6.4	19.7	8.3
V	9.5	3.6	9.3	3.6	9.3	5.2	6.4	3.3
A	3.0	2.7	2.4	3.2	3.6	3.1	4.1	3.7
T	3.4	2.5	3.7	3.0	4.6	3.7	5.1	3.6
F	4.5	6.4	3.9	3.0	4.6	4.5	5.4	3.9
C	3.1	2.9	2.5	2.5	4.4	4.7	5.2	4.0
D	2.0	2.1	1.7	2.3	3.6	8.7	3.3	3.3
SRS	99.3	72.0	96.6	80.6	88.5	93.3	86.8	71.7

Table 8

Number and percentage of first-time and experienced marathoners and exercise and sedentary control groups falling within BDI ranges

		Time of Measurement				
		BDI1	BDI2	BDI3	BDI4	BDI5
First-time:	0-9	59/92.2%	60/93.8%	57/89.1%	55/87.3%	55/87.3
	10-18	3/4.7%	4/6.2%	6/9.4%	9/12.7%	8/11.1
	19-29	2/3.2%				1/1.6%
	30 63			1/1.6%		
Experienc:	0-9	53/84.1%	55/87.3%	53/84.1%	52/82.5%	56/88.9
	10-18	8/12.7%	7/11.1%	9/14.3%	7/11.1%	5/7.9%
	19-29	2/3.2%	1/1.6%	1/1.6%	3/4.8%	2/3.2%
	30-63				1/1.6%	
Exercise:	0-9	51/78.5%	51/78.5%	51/78.5%	49/75.4%	50/76.9%
	10-18	12/18.4%	12/18.4%	12/18.4%	13/19.9%	14/21.6%
	19-29	2/3.1%	2/3.0%	2/3.0%	3/4.5%	1/1.5%
	30-63					
Seden:	0-9	40/67.8%	38/64.4%	38/64.4%	47/79.7%	45/76.3%
	10-18	16/27.1%	18/30.5%	16/27.1%	7/11.8%	9/15.2%
	19-29	3/5.1%	2/3.4%	5/8.5%	5/8.5%	4/6.8%
	30-63		1/1.7%			

Table 9

Mean and standard deviations of miles and days run in postmarathon training

	First-time				Experienced			
	days run		miles run		days run		miles run	
	M	SD	M	SD	M	SD	M	SD
0-2 weeks	5.0	3.2	27.7	21.3	5.6	3.5	31.8	21.8
3-8 weeks	20.2	9.0	114.9	74.9	23.0	9.5	135.0	73.6
9-16 weeks	43.0	19.0	235.2	134.2	49.5	19.5	301.2	169.4
17-24 weeks	22.5	9.1	117.2	53.0	24.7	10.0	133.6	72.2

Appendix 1

INFORMED CONSENT

The present investigation is concerned with the thoughts and feelings that occur before and after participation in a marathon. You will be asked to fill out several questionnaires prior to running the marathon. You will also be asked to fill out and return several questionnaires which will be mailed to you after running in the marathon. These questionnaires will be sent to you at a variety of times after the marathon. The data from the questionnaires will be reported only in group form, so that individual scores will remain confidential. Information obtained in this study will be recorded with a code number, so that only the primary investigator will have knowledge of individual data. You may discontinue participation in this research at any time without prejudice. There are no foreseeable harmful effects that might occur through your participation in the research project.

I hereby give voluntary consent to Doug Hankes of the University of North Texas in order that I might participate in the present investigation. I understand the procedure and am aware that I may discontinue my participation at any time.

Date _____

Name _____ (PRINT)

Signature_____

Appendix 2

DEMOGRAPHIC INFORMATION/RUNNING HISTORY

NAME _____

ADDRESS _____

_____

PHONE _____

1. Age _____ 2. Marital status _____

3. How many children are/were there in your family? _____ What was your ordinal position?_____

4. What is your finishing time goal for the marathon? _____

5. How certain are you that you can reach this goal?

1 2 3 4 5 6 7

not certain at all absolutely certain

6. For the 3 months prior to the marathon, approximately how many miles per week did you average?

_____miles

7. For the 2 months prior to the marathon, what was the average distance of your longest weekly run?

_____miles

8. At what pace do you run the majority of your mileage? _____ mins. _____ secs.

9. What is your personal best 10K time? _____

10. How many previous marathons have you run? _____

11. What is your personal best marathon time? _____

12. How many years have you been running? _____ years

13 When did you start training specifically for this marathon? _____

Appendix 2 cont.

14. How well do you think you have prepared for this marathon?

1	2	3	4	5	6	7
completely unprepared						completely prepared

15. How important is it for you to do well in this marathon?

1	2	3	4	5	6	7
not important						very important

16. How difficult do you anticipate it will be to complete the marathon?

1	2	3	4	5	6	7
very hard						very easy

17. Do you expect to "hit the wall" during the race?

1	2	3	4	5	6	7
certain I will						certain I won't

18. In the future, do you expect to run another marathon? ____Yes ____No

19. Why did you begin running?

1) _____

2) _____

20. What benefits do you get from running?

1) _____

2) _____

21. Are there negative consequences because you run?

1) _____

2) _____

Appendix 2 cont.

22. Have you suffered any running related injuries in the 3 months prior to the marathon?

_____Yes _____No If Yes, what were those injuries?

Appendix 3

Commitment to Running Scale

The following statements may or may not describe your feelings about running. Read each statement and then circle the appropriate number to indicate how well the the statement describes your feelings most of the time. There are no right or wrong answers. Do not spend too much time on any one item, but give the answers which seem to describe how you generally feel about running.

	strongly disagree	disagree	uncertain	agree	strongly agree
1. I look forward to running.	1	2	3	4	5
2. I wish there were a more enjoyable way to stay fit.	1	2	3	4	5
3. Running is drudgery.	1	2	3	4	5
4. I do not enjoy running.	1	2	3	4	5
5. Running is vitally important to me.	1	2	3	4	5
6. Life is so much richer as a result of running.	1	2	3	4	5
7. Running is pleasant.	1	2	3	4	5
8. I dread the thought of running.	1	2	3	4	5

Appendix 3 cont.

9. I would arrange or change my schedule to meet the need to run.	1	2	3	4	5
10. I have to force myself to run.	1	2	3	4	5
11. To miss a day's run is sheer relief.	1	2	3	4	5
12. Running is the high point of my day	1	2	3	4	5

Appendix 4

Masters-Ogles Marathon Scale

Please rate each of the following items according to the scale below in terms of how important it is as a reason for why you trained for and ran a marathon. A score of 1 would indicate that the item was "not a reason" for training for or running the marathon; a score of 7 indicates that the item was "a most important reason" for your training for and running the marathon; and scores in-between represent relative degrees of each reason.

Not A Reason						A Most Important Reason
1	2	3	4	5	6	7

1. _____ To help control my weight.
2. _____ To compete with others.
3. _____ To earn respect of peers.
4. _____ To reduce my weight.
5. _____ To improve my running speed.
6. _____ To earn the respect of people in general.
7. _____ To socialize with other runners.
8. _____ To improve my health.

Appendix 4 cont.

9. _____ To compete with myself.
10. _____ To become less anxious.
11. _____ To improve my self-esteem.
12. _____ To have something in common with other people.
13. _____ To add a sense of meaning to life.
14. _____ To prolong my life.
15. _____ To become less depressed.
16. _____ To meet people.
17. _____ To become more physically fit.
18. _____ To distract myself from daily worries.
19. _____ To make my family or friends proud of me.
20. _____ To make my life more purposeful.
21. _____ To look leaner.
22. _____ To try and run faster.
23. _____ To feel more confident about myself.
24. _____ To participate with my family or friends.
25. _____ To make myself feel whole.
26. _____ To reduce my chance of having a heart attack.
27. _____ To make my life more complete.
28. _____ To improve my mood.
29. _____ To improve my sense of self-worth.
30. _____ To share a group identity with other runners.
31. _____ It is a positive emotional experience.

Appendix 4 cont.

32. _____ To feel proud of myself.
33. _____ To visit with friends.
34. _____ To feel a sense of achievement.
35. _____ To push myself beyond current limits.
36. _____ To have time alone to sort things out.
37. _____ To stay in physical condition.
38. _____ To concentrate on my thoughts.
39. _____ To solve problems.
40. _____ To see how high I can place.
41. _____ To feel a sense of belonging with nature.
42. _____ To stay physically attractive.
43. _____ To get a faster time than my friends.
44. _____ To prevent illness.
45. _____ People look up at me.
46. _____ To see if I can beat a certain time.
47. _____ To blow off steam.
48. _____ Brings me recognition.
49. _____ To have time alone with the world.
50. _____ To get away from it all.
51. _____ To make my body perform better than before.
52. _____ To beat someone I've never beaten before.
53. _____ To feel mentally in control of my body.
54. _____ To get compliments from others.

Appendix 4 cont.

55. _____ To feel at peace with the world.

56. _____ To feel like a winner.

Appendix 5

Beck Depression Inventory

This questionnaire consists of 21 groups of statements. After reading each group of statements carefully circle the number (0, 1, 2, or 3) next to the statement which **best** describes the way you have been feeling the **past week, including today**. If several statements within a group seem to apply equally well, circle each one. **Be sure to read all the statements in each group before making your choice**.

1. 0 I do not feel sad.
   1 I feel sad.
   2 I am sad all the time and I can't snap out of it.
   3 I am so sad or unhappy that I can't stand it.
2. 0 I am not particularly discouraged about the future.
   1 I feel discouraged about the future.
   2 I feel I have nothing to look forward to.
   3 I feel the that the future is hopeless and that things. cannot improve
3. 0 I do not feel like a failure.
   1 I feel I have failed more than the average person.
   2 As I look back on my life, all I can see is a lot of failure.
   3 I feel I am a complete failure as a person.

Appendix 5 cont.

4. 0 I get as much as much satisfaction out of things as I used to.
   1 I don't enjoy things the way I used to.
   2 I don't get real satisfaction out of anything anymore.
   3 I am dissatisfied or bored with everything
5. 0 I don't feel particularly guilty.
   1 I feel guilty a good part of the time.
   2 I feel quite guilty most of the time.
   3 I feel guilty all of the time.
6. 0 I don't feel I am being punished.
   1 I feel I may be punished.
   2 I expect to be punished.
   3 I feel I am being punished.
7. 0 I don't feel disappointed in my self.
   1 I am disappointed in myself.
   2 I am disgusted with myself.
   3 I hate myself.
8. 0 I don't feel I am any worse than anybody else.
   1 I am critical of myself for my weaknesses or mistakes.
   2 I blame myself all the time for my faults.
   3 I blame myself for everything bad that happens.

Appendix 5 cont.

9. 0 I don't have any thoughts of killing myself.
   1 I have thoughts of killing myself, but I would not carry them out.
   2 I would like to kill myself.
   3 I would kill myself if I had the chance.

10. 0 I don't cry anymore than usual.
   1 I cry more than I used to.
   2 I cry all the time now.
   3 I used to be able to cry, but now I can't even though I want to.

11. 0 I am no more irritated now than I ever am.
   1 I get annoyed or irritated more easily than I used to.
   2 I feel irritated all the time now.
   3 I don't get irritated at all by the things that used to irritate me.

12. 0 I have lost interest in other people.
   1 I am less interested in other people than I used to be.
   2 I have lost most of my interest in other people.
   3 I have lost all of my interest in other people.

13. 0 I make decisions about as well as I ever could.
   1 I put off making decisions more than I used to.
   2 I have greater difficulty in making decisions than before.
   3 I can't make decisions at all anymore.

Appendix 5 cont.

14. 0 I don't feel I look any worse than I used to.
    1 I am worried that I am looking old or unattractive.
    2 I feel that there are permanent changes in my appearance that make me look unattractive.
    3 I believe that I look ugly.
15. 0 I can work about as well as before.
    1 It takes an extra effort to get started at doing something.
    2 I have to push myself very hard to do anything.
    3 I can't do any work at all.
16. 0 I can sleep as well as usual.
    1 I don't sleep as well as I used to.
    2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
    3 I wake up several hours earlier than I used to and cannot get back to sleep.
17. 0 I don't get more tired than usual.
    1 I get tired more easily than I used to.
    2 I get more tired from doing almost anything.
    3 I am too tired to do anything.
18. 0 My appetite is no worse than usual.
    1 My appetite is not as good as it used to be.
    2 My appetite is much worse now.
    3 I have no appetite at all anymore.

Appendix 5 cont.

19. 0 I haven't lost much weight, if any, lately.

1 I have lost more than 5 pounds.

2 I have lost more than 10 pounds.

3 I have lost more than 15 pounds.

I am purposely trying to lose weight by eating less.

Yes_____No_____

20. 0 I am no more worried about my health than usual.

1 I am worried about physical problems such as aches and pains; or upset stomach; or constipation.

2 I am very worried about my physical health and it's hard to think or much else.

3 I am so worried about my physical problems that I cannot think about anything else.

21. 0 I have not noticed any recent change in my interest in sex.

1 I am less interested in sex than I used to be.

2 I am much less interested in sex now.

3 I have lost interest in sex completely.

Appendix G

Positive and Negative Affect Schedule

This scale consists of a number of words that describe different feelings and emotions. Read each word and then circle the appropriate number in the space next to it. Indicate to what extent you have felt this way during the **past week**.

	1 Very slightly or not at all	2 A little	3 Moderately	4 Quite a bit	5 Extremely
Active	1	2	3	4	5
Afraid	1	2	3	4	5
Alert	1	2	3	4	5
Ashamed	1	2	3	4	5
Attentive	1	2	3	4	5
Distressed	1	2	3	4	5
Determined	1	2	3	4	5
Enthusiastic	1	2	3	4	5
Excited	1	2	3	4	5
Guilty	1	2	3	4	5
Hostile	1	2	3	4	5
Inspired	1	2	3	4	5
Interested	1	2	3	4	5

Appendix 6 cont.

Irritable	1	2	3	4	5
Jittery	1	2	3	4	5
Nervous	1	2	3	4	5
Proud	1	2	3	4	5
Scared	1	2	3	4	5
Strong	1	2	3	4	5
Upset	1	2	3	4	5

Appendix 8

Social Readjustment Scale

Which of the following situations have you experienced in the last 3 months? Check those that apply to you.

_____ 1. Death of a spouse.

_____ 2. Divorce.

_____ 3. Marital separation

_____ 4. Jail term

_____ 5. Death of a close family member

_____ 6. Personal injury or illness.

_____ 7. Marriage.

_____ 8. Fired at work.

_____ 9. Marital reconciliation.

_____ 10. Retirement.

_____ 11. Change in health of family member.

_____ 12. Change in personal income.

_____ 13. Sex difficulties.

_____ 14. Gain of new family member.

_____ 15. Business readjustment.

_____ 16. Change in financial state.

_____ 17. Death of close friend.

_____ 18. Change to different line of work.

Appendix 8 cont.

_____ 19. Change in number of arguments with spouse.

_____ 20. Mortgage over $10,000.

_____ 21. Foreclosure of mortgage or loan.

_____ 22. Change in responsibility at work.

_____ 23. Son or daughter moving away.

_____ 24. Trouble with in-laws.

_____ 25. Outstanding personal achievement.

_____ 26. Wife or husband begins or stops work.

_____ 27. Begin or end school.

_____ 28. Change in living conditions.

_____ 29. Revision or personal habits (for example, self care).

_____ 30. Trouble with boss.

_____ 31. Change in work hours or conditions.

_____ 32. Change in residence.

_____ 33. Change in schools.

_____ 34. Change in recreation.

_____ 35. Change in church activities.

_____ 36. Change in social activities.

_____ 37. Mortgage or loan less than $10,000.

_____ 38. Change in sleeping habits.

_____ 39. Change in number of family get togethers.

_____ 40. Change in eating habits.

_____ 41. Vacation.

Appendix 8 cont.

_____ 42. Christmas

_____ 43. Minor violations of the law.

_____ 44. Outstanding medical bills.

_____ 45. Additional care giving responsibilities (spouse, child, grandchild, sibling, others).

_____ 46. Son or daughter returning home.

_____ 47. Birth of a grandchild.

_____ 48. Your birthday.

_____ 49. Loss of driver's license or restrictions in ability to drive.

_____ 50. Impending institutionalization of a family member.

Appendix 9

Postmarathon Questionnaire

NAME_____

1. Did you complete the marathon?_____yes _____no
2. What was your time for the marathon? _____
3. How well do you think you prepared for the marathon?

1	2	3	4	5	6	7
completely unprepared						completely prepared

4. How difficult was it for you to complete the marathon?

1	2	3	4	5	6	7
very easy						very hard

5. In the future, do you expect to run another marathon?_____yes_____no
6. Did you experience a "runner's high" during the marathon?_____yes_____no
   If yes, when did it occur?_____mile
7. Did you "hit the wall" during the marathon?_____yes_____no
   If yes, when did it occur?_____mile
8. In general, what do you think you gained by running this marathon?
   1)_____
   2)_____
   3)_____

Appendix 9 cont.

9. Did what you gain by running the marathon justify the time and energy spent in training for the event?

1 2 3 4 5 6 7

absolutely did not absolutely did

10. In the 2 weeks since the marathon, how many days have you run?_____days

How many miles?_____

11. What other exercise have you done (e.g. swimming, cycling), and how much?

12. Have you suffered any injuries related to participation in the marathon?

_____yes_____no

If yes, please explain.

13. Are you recovering from the marathon as you expected?

1 2 3 4 5 6 7

much slower much faster

recovery recovery