Psychological Characteristics of the Obligatory Runner: A Critical Examination of the Anorexia Analogue Hypothesis

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Several aspects of obligatory running are examined with particular emphasis on the anorexia analogue hypothesis. The psychometric characteristics of the Obligatory Exercise Questionnaire were examined in a preliminary study. The OEQ is unrelated to socially desirable responding and has adequate reliability and validity. Data were collected from a second sample to identify obligatory and nonobligatory runners. Validation of the obligatory construct is examined by comparing demographic and training differences between obligatory and nonobligatory runners. Obligatory runners train more miles, days, and hours per week; have faster finishing times; are more likely to continue running when injured; and report feeling higher levels of anxiety when not running. The anorexia analogue hypothesis is examined by comparing the personality characteristics of obligatory and nonobligatory male marathon runners. Obligatory and nonobligatory runners were not significantly different on measures of identity diffusion or trait anger. They were significantly different on measures of perfectionism and trait anxiety.

Key words: obligatory exercise, marathons

Based on their interviews with an initial sample of 60 runners and their clinical experiences with anorexics, Yates and her colleagues (Yates, 1987, 1991; Yates, Leehey, & Shisslak, 1983) argue that a subgroup of middle-aged male runners are similar to adolescent anorexic women. For example, Yates (1991) suggests that anorexics and compulsive runners have similar family backgrounds, socioeconomic status, and personality characteristics, including inhibition of anger, extraordinarily high self-expectations, tolerance of pain, denial of disability, and a tendency toward depression. She further argues that excessive running and excessive dieting both represent partially successful attempts to establish an identity (Yates, 1987). This hypothesis that anorexics and compulsive runners share a core set of personality characteristics was originally labeled the
Anorexia Analogue Hypothesis

Anorexia Analogue Hypothesis (Yates, Leehey, & Shisslak, 1983). More recently, Yates (1991) devoted an entire book to comparing the shared physiological, psychological, and social bases of compulsive exercise and anorexia with the intent of demonstrating that both represent a core disorder of activity. In other words, both anorexics and compulsive exercisers are hypothesized to use an activity (eating or exercise) either to deal with intrapsychic issues or as the result of common personality characteristics.

The presentation of the anorexia analogue hypothesis by Yates et al. in 1983 was met with considerable debate and criticism. The original report was described by one author as “long on conjecture and short on data” (Wells, 1983, p. 47). Likewise, Stewart (1983) questions the validity of trying to “draw broad conclusions without presenting any form of analysis of the personality profiles” (p. 47). Although these criticisms have some merit, the tentativeness of these findings was acknowledged by the authors in the original report. To date, the anorexia analogue hypothesis has not yet been adequately tested. In fact, the literature concerning excessive exercise is filled with a myriad of terms representing the potential motives of hard-core exercisers (e.g., obligatory, compulsive, excessive, addiction, dedication, perfectionism, competition, zealoussness). These terms are often vaguely defined and hastily measured.

Although the research to date has suffered from definitional, measurement, and methodological problems, the continued study of obligatory exercise remains an important issue. The positive physical and psychological benefits of exercise are well known, yet a growing body of literature suggests that exercise can be harmful when used excessively (Dishman, 1985; Morgan, 1979). Of particular concern are individuals who appear to participate in exercise at all costs. So-called obligatory exercisers use large amounts of time to train numerous miles and hours per week. They may exercise despite injury, at the expense of interpersonal relationships, or with other consequences (Morgan, 1979; Yates, 1991; Yates, Leehey, & Shisslak, 1983).

However, only a handful of studies have attempted to address empirically the connection between eating disorders and obligatory exercise or to examine the motives of obligatory exercisers. Blumenthal, O’Toole, and Chang (1984) compared Minnesota Multiphasic Personality Inventory (MMPI) profiles of 43 male obligatory runners and 24 female inpatients diagnosed with anorexia nervosa. Anorexics scored significantly higher than the obligatory runners on 8 of the 10 clinical subscales. This finding was interpreted as indicating that, as a group, anorexics have significantly more pathology than obligatory runners. In fact, the researchers suggested that more differences than similarities existed between the two groups.

Goldfarb and Plante (1984) evaluated whether runners (136 men, 64 women) participating in a 10-kilometer road race obtained fear-of-fat scores similar to anorexics. They found that, on average, runners had low-to-normal fear-of-fat scores. However, “zealous” runners (those who ran more miles and had participated in at least 10 marathons) also exhibited high levels of anxiety, perfectionism, and obsessiveness as measured by the Activity Vector Analysis (Walter V. Clarke Associates, 1973). Goldfarb and Plante (1984) surmise that “the runners most closely resembling ‘obligatory runners’ in terms of their high zealoussness exhibited traits characteristic of anorexia nervosa patients, who are notorious for their obsessive compulsiveness and high anxiety” (p. 296).
Weight and Noakes (1987) examined the incidence of eating disorders among 125 female distance runners. A sedentary control group was drawn from two local university residences. The authors found that 18 of the runners (14%) had abnormal eating attitudes symptomatic of anorexia nervosa. Of these, only 5 (4%) also had low body mass and a past history of amenorrhea, and only 1 subject (0.8%) had been treated for anorexia. The authors interpreted these findings as failing to support Yates’ (1983) hypothesis.

Pasman and Thompson (1988) studied 15 male and 15 female obligatory runners. The extent of running obligation was measured with the Obligatory Exercise Questionnaire (OEQ). A cutoff score of 50 on the OEQ and a requirement that the subject runs at least 25 miles per week defined the sample. The control group for the study consisted of 15 male and 15 female sedentary individuals ranging in age from 18 to 60. Control subjects had an average OEQ score of 31. The subjects were required to estimate body size at four sites for themselves and for a mannequin. Subjects also completed paper-and-pencil inventories that measured body satisfaction and eating disturbance. The results of the study indicated that the obligatory runners made no more errors in size estimation than controls did. Runners also reported greater eating disturbance. Females were more dissatisfied with their body than males were, and the females also evidenced greater eating psychopathology. The authors concluded that these results partially support the connection between obligatory running and eating disorders.

Although the studies above provide mixed results regarding the anorexia analogue hypothesis, several criticisms of the studies deserve mentioning. First, the anorexia analogue hypothesis has often been misinterpreted, and as a result many studies do not directly address the hypotheses made by Yates et al. (1983). For the most part, the dependent variables do not assess diffusion of identity, expression of anger, perfectionism, or need for control. For example, Weight and Noakes (1987) examined the incidence of eating disturbance among female runners. Similarly, Nudelman, Rosen, and Leitenberg (1988) compared 20 “high-intensity male runners,” 20 sedentary male controls, and 20 women with bulimia in terms of anxiety about eating, preoccupation with food, excessive binge-eating, purging, negative preoccupation with weight, intent on losing weight, high personality traits presumed to underlie bulimia, and depression or low self-esteem.

Although the occurrence of eating disorders and eating disturbance among exercisers is an important issue, it is only an indirect component of the anorexia analogue hypothesis. The anorexia analogue hypothesis proposes that compulsive exercisers are similar to anorexics because they engage in excessive and sometimes dangerous levels of an activity (exercise) in an attempt to establish an identity (Yates et al., 1983). The analogue hypothesis does not propose that compulsive exercisers have eating disturbances. Direct evaluation of the personality characteristics that compulsive exercisers and anorexics are hypothesized to share is needed.

Second, there are mixed and untidy methods of determining obligatory running. Some of the studies use behavioral criteria whereas others use unvalidated measures. For example, Blumenthal et al. (1984) developed the 21 items of the obligatory running scale based on Yates et al.”s (1983) description of typical characteristics of the obligatory runner. Subjects endorsed each applicable characteristic by rating the item true. Items that did not apply to them were rated
false. Although the conceptual foundation of the instrument seems plausible, no reliability data were presented regarding the instrument. Similarly, the validity of the instrument was only superficially examined by comparing the mean rating of the runners to the mean of 20 volunteer controls. Other studies identify obligatory runners by using behavioral criteria such as miles of training per week or number of completed marathons (e.g., Goldfarb & Plante, 1984). Behavioral criteria are limited because they do not include the assessment of motives—runners who train a low number of miles could be considered obligatory because they refuse to take days off or run despite injury. Likewise, high-mileage runners may be highly competitive, but take days off when stale, taper before big races, and cross train when injured, all of which are contraindicative of obligatory exercise. Certainly, no agreed-upon measurement method or definition of obligatory exercise has been identified to date.

Third, some of the studies do not include appropriate control groups or use samples of women runners rather than men. The anorexia analogue hypothesis is specific to men. Although the examination of women runners in comparison to anorexics is a viable and interesting research area, the anorexia analogue hypothesis was originally restricted to men and has not yet been adequately tested.

**Purpose of the Present Study**

The present investigation attempted to improve upon previous evaluations of obligatory exercise by addressing four weaknesses of the earlier research. First, we attempted to improve upon the assessment of obligatory running by conducting a preliminary study using the Obligatory Exercise Questionnaire (Pasman & Thompson, 1988) in order to evaluate its reliability, sensitivity to socially desirable responding, and validity among a larger sample of runners. Second, we attempted to validate the obligatory construct by examining demographic and training differences between obligatory and nonobligatory runners. Third, when directly testing the anorexia analogue hypothesis, we included a control group consisting of nonobligatory runners. Fourth, we evaluated the following four specific aspects of the anorexia analogue hypothesis as proposed by Yates (1991) using psychometrically sound instruments:

1. Yates (1991) argues that obligatory runners and anorexics experience a sense of identity diffusion and that extreme commitment to running and extreme dieting both represent means of establishing identity. As a result, it was predicted that obligatory runners would show significantly more identity diffusion than nonobligatory controls as measured by the Ego Identity Scale (Tan, Kendis, Fine, & Porac, 1977).

2. Obligatory runners are hypothesized to share the anorexic woman's tendency to have extraordinarily high self-expectations. It was therefore predicted that obligatory runners would show higher levels of perfectionism than controls on the Multidimensional Perfectionism Scale (Frost, Marten, Lahart, & Rosenblate, 1990).

3. Yates (1991) argues that anorexics and obligatory runners have difficulty expressing anger. It was therefore hypothesized that obligatory runners would have higher levels of "trait anger" as that concept is defined by Spielberger and his colleagues (Spielberger, 1975; Spielberger, Jacobs, Russell, & Crane, 1982).
4. Obligatory runners were hypothesized to have higher levels of anxiety than nonobligatory runners (Yates, 1991). Group differences in trait anger and trait anxiety were assessed using the trait form of Spielberger’s State-Trait Personality Inventory (Spielberger, 1975, 1979).

**Methods**

**Subjects and Procedures**

Potential subjects were recruited at the prerace registration for three midwestern marathons and for a half-marathon and through a runners’ club. Questionnaires for the preliminary psychometric study were distributed to 250 runners with a total of 119 (48%) returned packets. The majority of the sample was drawn from runners registered to participate in a marathon (58.5%). However, runners registering to participate in half-marathon (36.8%), 10K (2.8%), and 5K (1.9%) races were also represented. The runners in the sample had participated in an average of 7.58 marathons (SD = 11.72) and had been running an average of 10.18 years (SD = 6.47). The modal number of completed marathons was only one, however (median = 30).

The second study, which examined the construct validity of the Obligatory Exercise Questionnaire (OEQ) and evaluated the anorexia analogue hypothesis, samples 375 male marathon runners. A total of 142 completed packets were returned, yielding a return rate of 38%. The return rate, along with the training and demographic characteristics, is comparable to other surveys of marathon runners and with the information of entire marathon registrations (Masters, Ogles, & Jolton, in press). The sample was divided into obligatory and nonobligatory groups based on subjects’ scores on the OEQ. A median split was used to define the two groups. The sample had an average age of 44.07 years (SD = 10.38 years) was predominantly white (96.5%) and married (65.7%). The average years of education was 15.89 years (SD = 2.66).

**Instruments**

**Information Sheet.** An information sheet was included in the questionnaire packet to gather demographic information about the sample. The information sheet also contained questions about training activities, including the number of miles run each week, the average amount of time spent running each week, the marathons completed, and the runner’s best marathon finishing time. Questions about exercise injuries were also included.

**The Obligatory Exercise Questionnaire.** The OEQ (Pasman & Thompson, 1988) is a 20-item scale modified from Blumenthal et al.’s (1984) Obligatory Running Questionnaire. The OEQ was selected instead of the Obligatory Running Questionnaire because the OEQ’s psychometric properties have been more extensively studied. In addition, the OEQ uses a 4-point Likert-type scale (never, sometimes, usually, always) rather than the original true/false format. By further evaluating the OEQ, we also hoped to assist in the validation of a measure of the obligatory construct that can be used with a variety of exercise groups (e.g., runners, cyclists, swimmers).

The scale has excellent internal consistency (α = .96) and test–retest reliability (r = .96). Early evidence for the validity of the scale has also been presented
(Pasman & Thompson, 1988). The scale has successfully discriminated among exercisers and control subjects and has demonstrated a relationship between anxiety and the inability to exercise or reluctance to stop exercising when injured. The total score was also correlated with external measures of exercise behavior such as number of hours/minutes spent exercising each week, number of miles run, and number of times participating in other forms of exercise each week.

The Ego Identity Scale (EIS). The Ego Identity Scale (Tan et al., 1977) is a brief, easily scored objective test of ego identity. Ego identity is defined as acceptance of one’s physical and psychological self, a sense of inner sameness and continuity, and an ability to make decisions. It also implies congruence between real and ideal self-images. Identity diffusion, on the other hand, is characterized by doubts about one’s self, a sense of discontinuity over time, and an inability to make decisions or commitments. The EIS is comprised of 12 item pairs that reflect Erikson’s (1950) concept of identity achievement. One statement in each pair represents identity diffusion, and the other indicates ego identity. The EIS is scored by assigning a score of 1 to each ego-identity statement circled by the respondent.

The scale was initially developed by first reviewing Erikson’s characterizations of ego-identity achievement. Statements reflecting identity achievement and identity diffusion were devised and grouped together in a forced-choice format. Items were then selected for the final scale based on their ability to discriminate between high and low scorers while being unrelated to social desirability. The remaining 12 items had an average interitem correlation of .114 and a split-half reliability of .68. In a second study, the EIS was significantly correlated in the predicted directions with four personality dimensions: internal control, intimacy, dogmatism, and extent to which values are derived from personal life experiences. Ego identity was also positively correlated with political and occupational commitment. Factor analysis of the scale extracted only one factor with an eigenvalue greater than one, which was interpreted as an indication of scale homogeneity.

The Multidimensional Perfectionism Scale (MPS). The available literature on perfectionism has emphasized the setting of excessively high personal standards of performance. The major difficulty with defining perfectionism in this manner is that it fails to distinguish perfectionistic people from those who are highly competent and successful. Hamachek (1978) makes a distinction between normal and neurotic perfectionists. Normal perfectionists set high personal standards yet “feel free to be less precise as the situation permits” (p. 27). Neurotic perfectionists, however, allow themselves little freedom to make mistakes. They are likely to feel that nothing is ever done completely enough or well enough. In addition, neurotic perfectionists are overly concerned about mistakes in performance. This overconcern leads them to strive for goals because of a fear of failure rather than because of a need for achievement. Neurotic perfectionists also have a tendency to doubt the quality of their own performance. This characteristic makes the perfectionists reluctant to complete a given task. Neurotic perfectionists are also overly concerned with the evaluations of parents and significant others. They may feel that ever-increasing levels of perfection are needed to gain love and approval. Finally, neurotic perfectionists are characterized by an overemphasis on order, precision, and organization. To others, these perfectionists may appear fussy and exacting.
The authors of the Multidimensional Perfectionism Scale (Frost et al., 1990) have attempted to develop a valid and reliable measure that taps each of the dimensions described above. The six subscales (Concern Over Mistakes, Personal Standards, Parental Expectations, Parental Criticism, Doubts About Action, and Organization) are composed of 36 items (6 items per scale).

The coefficients of internal consistency range from .77 to .93, and the reliability of the total scale was .90. Validity studies have demonstrated that each of the MPS subscales was significantly correlated with the Burns (1980) Perfectionism Scale, the Self-Evaluative Scale from the IBT (Jones, 1968), and the Perfectionism Scale from the EDI (Garner, Olmstead, & Polivy, 1983). Additional support for the scale’s validity comes from other investigations reported by Frost et al. (1990). For example, the scale and several of its subscales were correlated with other psychopathological symptoms such as procrastination, self-critical and dependency depression, guilt, and compulsivity. These findings suggest that the Multidimensional Perfectionism Scale possesses adequate reliability and validity.

The State-Trait Personality Inventory (STPI). The STPI is a 60-item, self-report inventory designed to measure the state and trait dimensions of anxiety, anger, and curiosity. The state form instructs the subject to rate how he or she is presently feeling. The trait form requires the respondent to rate how he or she generally feels. Each form consists of 30 items, 10 per dimension, which are rated along a 4-point Likert-type scale. A large number of studies have supported the reliability and validity of both forms of the STPI (e.g., Spielberger, 1975, 1979; Spielberger, Jacobs, Russell, & Crane, 1982). The mean scores for male college students on the state dimensions of anxiety, anger, and curiosity are 17.95, 13.42, and 26.85, respectively. The mean scores on the same trait dimensions are 17.88, 18.65, and 29.67, respectively. Only the trait dimensions were used in the present study.

Marlowe-Crowne Social Desirability Scale (MCSD). The Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960) is a 33-item self-report instrument consisting of items “defined by behaviors which are culturally sanctioned and approved but which are improbable of occurrence” (p. 350). It was designed to measure deviant response sets that are commonly characterized as “faking good” or “faking bad.” The instrument is often used to assess social desirability, particularly on paper-and-pencil self-report tests and has become a standard measure for this purpose.

Results

Evaluation of the Obligatory Exercise Questionnaire

In order to evaluate the psychometric properties of the Obligatory Exercise Scale and to provide information regarding the scale’s distribution using a larger sample of runners, we conducted a preliminary psychometric study by distributing the OEQ, MCSD, and an information sheet to a sample of runners participating in races of varying lengths. This pilot study provided an opportunity to evaluate the degree to which the questionnaire was susceptible to a social desirability response bias and to provide additional support for the validity of the questionnaire by examining its relationship to training and demographic variables.
Runners in the sample ran an average of 39.75 miles ($SD = 16.69$) per week in the 2 months prior to the race in which they were competing, and they planned to run an average of 39.79 miles ($SD = 16.34$) per week after completing the race. As a group, they ran slightly more than 5 days per week both before and after the race, $M = 5.38, SD = 1.25,$ and $M = 5.43, SD = 1.19,$ respectively.

The majority (80.5%) of the sample reported having experienced a running-related injury, and 66% of those who did report an injury continued to run even when injured. The runners in the sample had an average anxiety rating of 5.29 ($SD = 1.43$) on a 7-point Likert-type scale if they were unable to exercise for a period of one week. They reported a moderate likelihood of continuing to run following a persistent, painful injury, $M = 4.17, SD = 1.82$ on 7-point scale.

The Obligatory Exercise Questionnaire (Pasman & Thompson, 1988) was completed by 113 respondents. The OEQ scores appeared to be normally distributed, and no outliers were observed. There was no evidence for ceiling or floor effects; scores ranged in magnitude from 35 to 74. The sample had a mean score of 52.41 ($SD = 7.098$). The modal score was 48, and the median score was 52. Cronbach’s coefficient alpha for the present sample was .79. Although this figure suggests adequate internal consistency, it is somewhat lower than the .96 value reported by Pasman and Thompson (1988).

Bivariate correlation coefficients were computed between the total OEQ and each of the demographic and training variables. The correlation between the OEQ and the Marlowe-Crowne Social Desirability Scale was also computed. Two correlations were significant at the $p < .05$ level: miles run per week in the 2 months prior to the race ($r = .22$) and anticipated miles per week following the race ($r = .21$). Five additional correlations were significant at the $p < .01$ level: OEQ score and self-reported anxiety if unable to run for one week ($r = .47$), likelihood of running despite injury ($r = .33$), number of days run per week after having completed a marathon ($r = .34$), number of days run per week prior to the marathon ($r = .40$), and hours run per week prior to the race ($r = .27$). Interestingly, OEQ scores were unrelated to best finish times, $p > .05$. The correlation between OEQ scores and the Marlowe-Crowne Social Desirability scale were not significant ($r = .01$).

**Validation of the Obligatory Construct**

In order to further investigate the construct validity of the obligatory construct and to further test the anorexia analogue hypothesis, a second sample of runners were administered the OEQ, MPS, STPI, EIS, and the information sheet. Again, OEQ scores appeared to be normally distributed, and no outliers were observed. Scores ranged in magnitude from 40 to 74. The sample had a mean score of 51.74 and a standard deviation of 6.08. The median score was 51. Thus, respondents who scored 51 or greater were placed in the obligatory group and those who scored less than 51 comprised the nonobligatory group. This cutoff score was similar to that used in the Pasman and Thompson (1988) study. The split score was also conceptually meaningful in that subjects who scored above 50 were rating the items on the average closer to the anchors labeled “3 = usually” or “4 = always,” whereas those below 50 were rating the average item closer to the anchors labeled “2 = sometimes” and “1 = never.” Thus, runners with scores above 51 were rating the items as typical for them while the identified nonobligatory group rated the items as infrequent. The obligatory group had a
mean total score of 56.64 (SD = 4.60) and included 65 runners; the nonobligatory group had a mean score of 47.60 (SD = 3.57) and included 77 runners. This difference was statistically significant, \( t(140) = 13.19, p < .001 \).

The two groups did not differ significantly in racial composition, \( p > .05 \). As a whole, the sample was 96.5% white and 3.5% nonwhite. The groups also did not differ in terms of marital status, \( p > .05 \). By self-report, 18.6% of the sample had never been married, 65.7% were presently married, and 15.7% were divorced. The obligatory and nonobligatory groups did not differ significantly in their response to the question, ‘‘Have you ever been seriously injured while running?’’ \( p > .05 \). Slightly less than half of the sample (47.9%, \( n = 68 \)) answered this question affirmatively and described their injury or injuries. Although the type of injury was not specifically coded, the most commonly described injuries appear to have resulted from overuse (e.g., plantar fasciitis). Of those who reported a serious injury, 87.3% reported stopping training for some length of time. The effect of obligatory group was significant for this variable, \( \chi^2 (1, n = 71) = 5.33, p < .05 \). The obligatory group had a higher proportion of runners who did not stop running because of injury than was expected. There were no group differences in length of time stopped between obligatory runners and nonobligatory runners who did stop running because of injury, \( p > .05 \). The two groups did not differ in age, \( p > .05 \). They also did not differ in number of years of education, \( p > .05 \).

Several training and competition variables were significantly different for the two groups (Table 1). The obligatory group ran more miles per week than the nonobligatory group. Likewise, the obligatory group spent more time running each week than did the nonobligatory group. In direct contrast to the preliminary study in which OEQ scores were not significantly related to finish times, the obligatory group in our second study had faster finish times than the nonobligatory runners. Although the obligatory group had faster finish times, they had not participated in more marathons.

Testing the Anorexia Analogue Hypothesis

The two running groups were then compared using measures of personality characteristics thought to be common to anorexics: MPS, STPI, and EIS. Means, standard deviations, and significance levels for the STPI and EIS are shown in Table 1. The groups did not differ in terms of identity diffusion as measured by the EIS. Although obligatory runners had slightly higher levels of trait anger than nonobligatory runners, the difference was not significant. However, both groups had substantially higher levels of trait anger than the normative sample described by Spielberger et al. (1982). Finally, as expected, the obligatory group did have higher levels of anxiety than the nonobligatory group.

The degree of perfectionism observed in each group was tested using a one-way multivariate analysis of variance (MANOVA). The 142 cases with complete Multidimensional Perfectionism Scale data were selected for the analysis, 77 from the nonobligatory group and 65 from the obligatory group. The preliminary tests of normality and homogeneity of variance and covariance tests indicate that the MPS data met the assumptions of MANOVA. The main effect for group membership was significant, Pillai’s = .116, \( F(6, 135) = 2.96, p < .05 \). The squared canonical correlation was .116, indicating that the multivariate effect explained 11.6% of the total variance. Four of the six univariate \( F \) tests were
Table 1
Means, Standard Deviations, and Significance of Comparisons for Obligatory and Nonobligatory Groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obligatory M</th>
<th>SD</th>
<th>Nonobligatory M</th>
<th>SD</th>
<th>Significancea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>43.55</td>
<td>9.25</td>
<td>44.48</td>
<td>11.24</td>
<td>p &gt; .05</td>
</tr>
<tr>
<td>Education (years)</td>
<td>15.95</td>
<td>2.39</td>
<td>15.84</td>
<td>2.87</td>
<td>p &gt; .05</td>
</tr>
<tr>
<td>Miles per week</td>
<td>37.69</td>
<td>16.36</td>
<td>31.53</td>
<td>12.00</td>
<td>p &lt; .01</td>
</tr>
<tr>
<td>Hours per week</td>
<td>6.54</td>
<td>3.52</td>
<td>5.37</td>
<td>2.49</td>
<td>p &lt; .05</td>
</tr>
<tr>
<td>No. of marathons</td>
<td>10.30</td>
<td>14.24</td>
<td>8.23</td>
<td>17.08</td>
<td>p &gt; .05</td>
</tr>
<tr>
<td>Best time (hours)</td>
<td>3.39</td>
<td>0.50</td>
<td>3.75</td>
<td>0.62</td>
<td>p &lt; .01</td>
</tr>
<tr>
<td>Time not running after injury (weeks)</td>
<td>10.46</td>
<td>11.12</td>
<td>9.60</td>
<td>16.15</td>
<td>p &gt; .05</td>
</tr>
<tr>
<td>Trait anxiety score</td>
<td>18.85</td>
<td>5.87</td>
<td>16.45</td>
<td>4.45</td>
<td>p &lt; .01</td>
</tr>
<tr>
<td>Trait anger score</td>
<td>20.88</td>
<td>6.03</td>
<td>19.25</td>
<td>5.30</td>
<td>p &gt; .05</td>
</tr>
<tr>
<td>Ego identity scale</td>
<td>8.34</td>
<td>2.18</td>
<td>8.68</td>
<td>1.96</td>
<td>p &gt; .05</td>
</tr>
</tbody>
</table>

aAll comparisons were independent t tests that used pooled estimates of error. The alpha level was adjusted to .01 to account for the multiple tests of seven interrelated demographic and training variables. The alpha level was .05 for the independent anxiety, anger, and identity tests.

significant using an alpha level of .05. The concern over mistakes, personal standards, organization, and doubts about action subscales were relatively elevated for the obligatory group. The subscale means, standard deviations, and significance levels are shown in Table 2.

Discussion

This study set about to improve research regarding obligatory exercise by enhancing the reliable measurement of obligatory exercise through psychometric examination of the Obligatory Exercise Questionnaire, substantiating the existence of the obligatory construct by cross-validating the relationship of the Obligatory Exercise Questionnaire to training and demographic variables, and by examining the relationship of obligatory running to specific personality characteristics thought to be present in both compulsive exercisers and anorexics.

Obligatory Exercise Questionnaire

The results of the pilot study suggested that the Obligatory Exercise Questionnaire (Pasman & Thompson, 1988) is an instrument that provides a useful index of the obligatory exercise construct. The items of the scale were adequately homogeneous and appear to be content valid. The total scores were normally distributed with no outliers and were unaffected by restriction of range. The instrument was unrelated to a social desirability response bias. Finally, the scores were conceptually meaningful in that the average (52) was approximately midway between the lowest possible score (20) and the highest possible score (80). This
Table 2

Perfectionism Subscale Means, Standard Deviations, and Significance of Group Comparisons

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Obligatory</th>
<th>Nonobligatory</th>
<th>F*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Concern over mistakes</td>
<td>22.91</td>
<td>6.34</td>
<td>19.58</td>
</tr>
<tr>
<td>Personal standards</td>
<td>25.14</td>
<td>4.60</td>
<td>23.62</td>
</tr>
<tr>
<td>Parental expectations</td>
<td>13.92</td>
<td>3.95</td>
<td>13.66</td>
</tr>
<tr>
<td>Parental criticism</td>
<td>8.77</td>
<td>3.29</td>
<td>8.31</td>
</tr>
<tr>
<td>Doubts about action</td>
<td>9.83</td>
<td>2.60</td>
<td>8.35</td>
</tr>
<tr>
<td>Organization</td>
<td>23.37</td>
<td>4.82</td>
<td>21.71</td>
</tr>
</tbody>
</table>

*aAll univariate F tests with (1, 140) degrees of freedom.

*p < .05.

indicates that the average respondent was endorsing a descriptor midway between sometimes and usually for each obligatory item. In sum, the Obligatory Exercise Questionnaire appears to be a psychometrically sound and conceptually useful instrument.

**Construct Validity**

Not only is the Obligatory Exercise Questionnaire a reliable instrument, it also appears to tap the appropriate behavioral dimensions of the obligatory construct that it purports to measure. Runners who had higher scores on the OEQ were more likely both to report anxiety when unable to run and to run despite injury. They were also more likely to indicate that they would continue to run if injured in the future. Higher scores on the OEQ were also related to the intensity of training. Runners who had higher scores were more likely to train more miles, days, and hours per week. It was not surprising, then, to find that these same runners had faster finishing times in a marathon. In addition, the nonsignificant findings may be as important as the significant findings. The OEQ was not related to race, marital status, age, years of education, number of injuries, or number of previous marathons. Overall, the OEQ appears to be validly assessing the broadly defined construct of obligatory running. Runners with higher scores are more likely to train more intensely, run despite injury, and experience anxiety when not running.

**Anorexia Analogue Hypothesis**

The anorexia analogue hypothesis as it is set forth by Yates et al. (1983) translates into several specific hypotheses. The first of these is that obligatory runners use running to shore up a poorly developed sense of self. They purportedly use running as a means of establishing an identity in much the same way that an anorexic woman uses the rituals and habits of dieting to define her identity. Yates (1991) argues that extreme dieting and extreme running represent partially
successful attempts to establish identity. It was predicted that nonobligatory runners would show a more highly developed sense of identity than the runners in the obligatory group. This prediction was not supported in the present study. Although the nonobligatory runners had an average Ego Identity Scale (Tan et al., 1977) score that was higher than that obtained by the obligatory group, the difference was not statistically significant. One explanation for this finding is that group differences in ego identity development do not exist. A second possible explanation is that feelings of identity diffusion begin to recede as the obligatory runner begins to run purposefully, and group differences that initially existed begin to disappear. Alternatively, failure to find significant differences between the two groups may simply reflect a lack of sensitivity in the method of measurement. Clearly, identity is a difficult concept to define. Future research should focus on multidimensional assessment of this elusive construct. The present study used an instrument that was based on the Eriksonian theory of ego development. Other theoretical approaches or longitudinal methodologies may provide conflicting results.

The second tested hypothesis involved the trait of perfectionism. Yates et al. (1983) argued that obligatory runners were similar to anorexic women in terms of their pursuit of personal perfection. Both groups appear to be overly concerned with issues of achievement and control. They are also often described as having extraordinarily high self-expectations. The present study predicted that obligatory runners would have higher Multidimensional Perfectionism Scale (Frost et al., 1990) scores than their nonobligatory counterparts. This prediction was supported in the present study. The obligatory group was indeed more perfectionistic than the nonobligatory group. Not all components of perfectionism, however, were equally important. In particular, neither the Parental Expectations nor the Parental Criticism subscales were particularly useful in distinguishing the two groups of runners. Issues of parental control and parental expectations were of remote concern for this primarily middle-aged sample. In fact, one respondent noted that “[my] parents have been dead for 30 years... it is hard to remember some of this stuff.” Moreover, the Parental Expectations and Parental Criticism subscales may not be central to the concept of perfectionism. They account for only 3.5% and 8.6% of the total scale variance, respectively. These dimensions are also weakly correlated with other measures of perfectionism such as the Burns (1980) Perfectionism Scale, the Self-Evaluative Scale of the Irrational Beliefs Test (Jones, 1968), and the Perfectionism Scale from the EDI (Garner et al., 1983).

Age-relevant concerns about organization, doubts about action, and worry over mistakes, however, were more characteristic of the obligatory group. Concern about or fear of making mistakes appears to be a major difference between obligatory and nonobligatory runners. According to Hamachek (1978), overconcern for mistakes is the central component of perfectionism. Fear of failure, rather than a need for achievement, drives the perfectionistic individual to strive for goals. Frost and his colleagues (1990) also argue that the perfectionist engages in the dichotomous thinking style that often characterizes depression. The perfectionist may feel that his or her performance must be flawless, or it is worthless. Any minor error or departure from expectations constitutes failure. As it applies to running, it would appear that at least a portion of the motivation driving obligatory runners is related to a fear of failure. Obligatory runners may believe
that making a mistake will cause others to think less of them; they believe that the fewer mistakes they make, the more others will like them; and they may also believe that a partial failure is as bad as a complete failure. For obligatory runners, acceptance and approval of friends and family may be contingent on their performance. Obligatory runners are, perhaps, more likely to view themselves as failures when missing a planned training run or cutting back on miles and therefore train more intensely.

Runners in the obligatory group also reported higher personal standards. They were more likely to agree with statements such as “I set higher goals than most people.” They may believe that if they accept less than their best, then they are likely to end up a second-rate person. Meeting these standards is an impossible and frustrating task that may leave the obligatory runner feeling frustrated, angry, or depressed. According to Frost et al. (1990), the Personal Standards subscale is moderately correlated with depression and anxiety as measured by the Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983). On the other hand, the Personal Standards subscale is also correlated with the Efficacy subscale of the Depressive Experiences Questionnaire (DEQ; Blatt, D’Afflitti, & Quinlan, 1976) and is associated with a more positive self-concept.

Besides an overconcern with mistakes and extraordinarily high personal standards, obligatory runners show a tendency to have doubts about the quality of their work. They report a pervasive feeling that something “is not quite right.” They may also take longer to complete some tasks because they repeat the task until it is done to their satisfaction. Obligatory runners also appear to emphasize organization more than their nonobligatory counterparts do. They are more likely to endorse items that reflect a concern for precision, order, and neatness. Frost et al. (1990) argue that this tendency may cause the perfectionistic individual to be seen by others as “fussy and exacting” (p. 451).

In summary, obligatory runners appear to be more perfectionistic than nonobligatory runners. In particular, they seem overly concerned with making mistakes and achieving high personal standards. They may unduly emphasize organization and neatness and may have a tendency to ruminate about the quality of their performance. Each of these characteristics has also been reported to occur with anorexia nervosa (Yates, 1991; Yates et al., 1983). Thus, it appears that there is some descriptive overlap between these two syndromes. However, it would certainly be premature to conclude that this similarity represents a common etiology. Future research should attempt to investigate the origins of perfectionism in both groups.

The third and fourth hypotheses involve the experiences of anxiety and anger. Yates et al. (1983) argue that both anorexics and obligatory runners have difficulty in affective expression. In particular, they are purported to have trouble discharging feelings of anger and anxiety. Therefore, it was predicted that the obligatory group would have higher levels of trait anger and trait anxiety than the nonobligatory group.

The difference in trait anger was in the expected direction, but was not statistically significant. However, it is worth noting that both groups had high levels of trait anger. Thus, a ceiling effect may have been operating that prevented the detection of group differences. High levels of trait anger are interpreted as a proneness to anger arousal. Individuals who score high on this scale are likely to “perceive a wide range of situations as anger-provoking” (Spielberger et al.,
1982, p. 169). They are also more likely to experience any given situation as frustrating, annoying, or irritating. Individuals with high levels of trait anger are also likely to respond to such situations with intense elevations in state anger.

The groups did differ significantly in trait anxiety; the obligatory group had substantially higher levels of trait anxiety. The trait anxiety scale is purported to measure relatively stable differences in anxiety proneness (Spielberger, 1975). An individual with a high level of trait anxiety is likely to perceive a wide range of situations as threatening and will react to these situations with elevations in state anxiety. Moreover, these elevations in state anxiety will be more intense than those observed in an individual with a low level of trait anxiety. Spielberger (1975) also argues that "persons high in anxiety proneness are disposed to perceive greater danger in relationships with other people that involve threats to self-esteem and to respond to these ego threats with greater elevations in state anxiety" (p. 137) than would persons low in anxiety proneness. Persons with high and low trait anxiety do not appear to differ in their response to actual physical dangers (Spielberger, 1975). Thus, the profile of the obligatory runner that emerges is of an individual who has a dispositional proneness to more frequent and intense anxiety experiences. He is particularly vulnerable to situations that might be perceived as threatening his ego or self-esteem. Given this profile, one might expect a high correlation between trait anxiety and several of the perfectionism subscale scores. High correlations were noted between anxiety and doubts about action and between anxiety and concern for mistakes within both cells.

Conclusions, Limitations, and Final Comments

In summary, the present study provides evidence regarding the definition, measurement, and validity of the obligatory construct and provides partial support for the anorexia analogue hypothesis. Obligatory runners appear to be more perfectionistic and to have higher levels of trait anxiety than nonobligatory runners. These qualities do not seem to cause much impairment, however. Running appears to represent a successful coping mechanism for most individuals. It becomes problematic only when the obligatory individual is unable to run because of injury or other circumstances. The obligatory runner is more likely to continue running despite injury. This tendency may lead to more serious and longer lasting injuries. He is also likely to experience higher levels of anxiety when unable to run. The increased anxiety when unable to run suggests that the obligatory runner uses a limited repertoire of coping responses. The examination of differences in coping styles offers a valuable direction for future research. The two groups of runners did not differ in terms of trait anger or identity development. The robustness of these findings also needs to be determined by additional research.

The present study also concludes that obligatory running is a bona fide syndrome. It is characterized for the men in this study by a variety of training and psychological variables. The obligatory runner trains intensely, runs more miles per week, and spends more time running. The obligatory runner feels guilty or anxious when he is unable to run. The obligatory runner is also more likely to continue running even when bothered by the persistent pain of a running injury. He feels compelled to run, pushed on to achieve a personal goal. The obligatory runner is a perfectionistic individual. He is overly concerned about
making mistakes and has a tendency to doubt the quality of his performance. The obligatory runner may also emphasize precision, order, and neatness. The obligatory individual also shows a tendency to inhibit his affective expression. He may feel more anxious than the nonobligatory runner. These feelings probably become most intense when running becomes impossible. These psychological characteristics of perfectionism and inhibited affective expression have some similarity to the portrait of the young anorexic that is often presented in the clinical literature. The anorexic woman is often described as hardworking, self-effacing, and achievement oriented (Yates et al., 1983). She may also have difficulty expressing her emotions and have a poorly developed sense of self. These similarities suggest a link between obligatory running and anorexia nervosa. However, at the present time, this link is purely speculative. Anorexia has similarities to a number of other syndromes, including depression and obsessive-compulsive disorder. It seems premature to conclude that obligatory exercise and anorexia nervosa represent a common pathology. Future research is needed to directly compare obligatory runners and anorexics.

The findings of the present investigation also must be evaluated within the limits of the study's design. Clearly, the present study has some characteristics that restrict the generalizability of the results. For example, the present study employed a survey design. Obviously, those individuals who chose to participate represent a self-selected sample. Even though the samples are similar to other studies conducted using runnings, it is unclear whether their responses would generalize to all runners. Likewise, the present study included only runners who were competing in road races. Obligatory runners who do not participate in marathons may present different psychological profiles. The present study used only male runners. Future research should investigate the characteristics of the female obligatory runner. Finally, the present study used only the OEQ to define the obligatory and nonobligatory groups. Future researchers might wish to use multiple inclusion and exclusion criteria.

It is difficult to determine what implications the present study has for the future of the anorexia analogue hypothesis simply because Yates et al. (1983) conceptualized that hypothesis so loosely. For example, the authors never really explained what they meant by obligatory running and how that construct should be operationalized. They also did not offer any guidelines about the prevalence of obligatory running in the general population. If obligatory running is indeed related to anorexia nervosa, should the two conditions afflict similar numbers of individuals? If so, the operational definition of obligatory running used in the present study would certainly be much too broad.

Yates and her colleagues (Yates, 1991; Yates et al., 1983) also did not sufficiently describe the characteristics that obligatory runners and anorexics are purported to share. It is not clear, for example, what components of perfectionism were hypothesized to be relevant to both groups. As we have seen, perfectionism is a multidimensional construct that might include components as diverse as an overconcern for order and organization or an emphasis on parental standards and criticism. The present study has indicated that not all of these components are equally important in distinguishing obligatory and nonobligatory runners. Research has yet to demonstrate which components are most useful in distinguishing anorexics from other groups (e.g., other eating disorders, controls). Yates (1991) was also vague in the description of the obligatory runner's emotional state. Yates
reported that the obligatory individual and the anorexic patient both demonstrate a restricted expression of affect despite having internal experiences of anger, anxiety, and so forth. The present study has interpreted this as meaning that these groups should show higher trait levels of certain emotions because these emotions are seldom discharged actively. It is unclear whether Yates would agree with this interpretation. Finally, much of the anorexia analogue hypothesis hinges on the argument that excessive running and excessive dieting are a means of establishing identity. As was noted previously, identity is an elusive concept. There are perhaps as many notions of identity as there are theories of personality. Although Yates (1991) did not specify what she meant by identity diffusion, the present study used an Eriksonian conceptualization of identity. Clearly, other methods of operationalizing identity might yield different results.

It is hoped that the present study and others like it will lead to a restatement of the anorexia analogue hypothesis in more precise terms. A model stated in testable terms would better allow researchers to determine the link between anorexia and obligatory exercise.

References


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Authors’ Note

This paper is based on a dissertation submitted by Stephen Paul Coen in partial fulfillment of the requirements for the doctoral degree at Ohio University.