Predictive and Treatment Validity of Life Satisfaction and the Quality of Life Inventory

Michael B. Frisch  
Baylor University

Michelle P. Clark  
Iowa State University Student Counseling Service

Steven V. Rouse  
Pepperdine University

M. David Rudd  
Jennifer K. Paweleck  
Andrew Greenstone  
David A. Kopplin  
Baylor University

The clinical and positive psychology usefulness of quality of life, well-being, and life satisfaction assessments depends on their ability to predict important outcomes and to detect intervention-related change. These issues were explored in the context of a program of instrument validation for the Quality of Life Inventory (QOLI) involving 3,927 clients from various clinical settings. Clinical norms were also generated that supplement existing nationwide norms. The predictive validity of the QOLI and life satisfaction in a university counseling center was supported in terms of its ability to predict academic retention both by itself and in conjunction with cumulative grade point average 1 to 3 years in advance. The QOLI was also found to be sensitive to treatment-related change in two naturalistic clinical settings and samples. The interpretation and intervention utility of measures of quality of life, well-being, and life satisfaction are discussed with respect to clinical and positive psychology research.

This research was supported, in part, by 2000 and 2002 sabbaticals granted to Michael B. Frisch. This article is based, in part, on the following paper: Frisch, Michael B., Clark, Michelle P., Rouse, Steven V., Rudd, M. David, Paweleck, Jennifer, Greenstone, Andrew, and Kopplin, David A. (2001, December). Predictive and Treatment Validity of the Quality of Life Inventory or QOLI in Managed Care, Substance Abuse, Community Mental Health, and Counseling Center Samples. Paper presented at the annual meeting of the International Society for Quality of Life Studies, Washington, D.C. The authors gratefully acknowledge the invaluable assistance of Professors Olga Paradis, Billie Peterson-Lugo, and Jeffrey Steely of the Baylor University Libraries; the following research assistants: Scott Dugan and Aimee Segura; the invaluable assistance of the Waco branch of TDMHMR, especially that of Dr. Manuel Edquist, Grace Walton, Cindy Forcher, and Patricia Kelm; the invaluable assistance of the Behavioral Health Services Division of the Allina Health System of Minneapolis, Minnesota, especially that of Joyce Arendt, Julie Godfrey, and Doug Nemecek; and the invaluable assistance of Virginia (Ginny) Steele of Pearson Assessments. Correspondence regarding this manuscript may be directed to Michael B. Frisch, Ph.D., Professor, Department of Psychology and Neuroscience, Baylor University, P.O. Box 97334, Waco, TX 76798; phone: 254-710-2252/2961; fax: 254-710-3033; e-mail: michael_frisch@baylor.edu

Assessment, Volume 12, No. 1, March 2005 66-78  
DOI: 10.1177/10775439104268006  
© 2005 Sage Publications
Keywords: quality of life; quality of life assessment; health-related quality of life; life satisfaction; subjective well-being; well-being; positive psychology; chemical dependency; substance abuse; managed care; behavioral healthcare; counseling psychology; depression; community mental health

One way to be accountable to clients and to payers is to demonstrate clinically significant change as a result of treatment. According to Kazdin (1993a, 1993b, 1994, 2003)—also see Berzon, 1998; Diener & Seligman, in press; Fava & Ruini, 2003; Frisch, 1998b, 2000, 2000, in press; Frisch, Cornell, Villanueva, & Retzlaff, 1992; Furner, 2000; Gladis, Gosch, Dishuk, & Crits-Christoph, 1999; Heimberg and his colleagues [Eng, Coles, Heimberg, & Safren 2001; Eng, Coles, Turk, Heimberg, & Safren 2001; Eng, Heimberg, Hart, Schneier, & Leibowitz, 2001; Safren, Heimberg, Brown, and Holle, 1997]; Huebner and his colleagues [Huebner, 1994; Huebner, Drane, & Valois, 2000; Valois, Zullig, Huebner, & Drane, 2001]; Jenkins, 1992; Matarazzo, 1992; Mendlowicz & Stein, 2000; Ogles, Lambert, & Masters, 1996; Ogles, Lunnen, & Bonesteel, 2001; Rabkin, Wagner, & Griffin, 2000; Rush, 2000; Seligman, 2002; Sirgy, 2002; Snyder & Lopez, 2002; Spilker, 1996; Strupp and his colleagues [Strupp, 1996; Strupp & Hadley, 1977]), no variable is more clinically important or significant than quality of life, a very noticeable and central part of clients' everyday functioning and experience. To the extent that treatment leads to improved quality of life as well as to symptomatic improvement, it can be said that clinically significant change has occurred. Besides outcome evaluation, quality of life measures can assist in (a) assessing assets and “problems of living” that contribute to or complicate disorders (Frisch, 1992, 1998b; Frisch et al., 1992; Persons & Bertagnolli, 1999), (b) treatment planning and case conceptualization (Frisch, 1992, 2004, in press; Persons & Bertagnolli, 1999), and (c) screening those at high risk for future health, relapse, and work problems (Diener, Suh, Lucas, & Smith, 1999; Frisch, 1998b, 2004, in press; Jenkins, 1992; Lewinsohn, Redner, & Seeley, 1991; Safren et al., 1997; Seligman, 2002; Spilker, 1996; Strupp, 1996).

Quality of life is often equated with life satisfaction in psychology and psychiatry and to a lesser extent in general medicine and cancer treatment (Cornell, Saunders, Paunovich, & Frisch, 1997; Crowley & Kazdin, 1998; Ferrans & Powers, 1992; Frisch, 1998b, 2004, in press; Kazdin, 1993a, 1993, 1994, 2003; Heimberg and his colleagues [Eng, Coles, Heimberg, et al., 2001; Heimberg, 2002; Safren et al., 1997]); Huebner and his colleagues [Gilman & Huebner, 2000; Huebner 1994; Huebner et al., 2000; Valois et al., 2001; Zullig, Valois, Huebner, Oeltmann, & Drane, 2001]; Ogles et al., 1996; Ogles et al., 2001; Rabkin et al., 2000; Snyder, Stanley, Novey, Averill, & Beck, 2000; Strupp and his colleagues [Strupp, 1996; Strupp & Hadley, 1977]). For example, all three general purpose or “non–disease specific” quality of life measures chosen for inclusion in the American Psychiatric Association’s Handbook of Psychiatric Measures are life satisfaction measures (Rabkin et al., 2000). When quality of life is not equated with life satisfaction, life satisfaction is usually included as an essential component of a quality of life battery of assessments (Berzon, 1998; Diener & Seligman, in press; Ferrans, 2000; Frisch 1998b; Gladis et al., 1999; Spilker, 1996). Treatment that alleviates symptoms and restores basic contentment—defined in terms of life satisfaction by Strupp (1996) and others (e.g., Diener & Seligman, in press)—is viewed as successful and as clinically significant; satisfaction or contentment is reflected in a client’s answers when asked, “Are you basically satisfied with your life?” or “Are you satisfied with the parts of life that matter most to you?”

The QOLI (pronounced kwal’i) or the Quality of Life Inventory is a measure of life satisfaction, well-being, positive psychological, and positive mental health (Frisch, 1994a, 1994b; Frisch, 2004, in press). Despite some positive evaluation with respect to the QOLI (e.g., see Ben-Porath, 1997; Crits-Christoph & Connolly, 1997; Crowley & Kazdin, 1998; Eng, Coles, Heimberg, et al., 2001; Horowitz, Strupp, Lambert, & Elkin, 1997; Kazdin, 1993a, 1993b, 1994, 2003, 2003; Rabkin et al., 2000; Mendlowicz & Stein, 2000; Moras, 1997; Ogles et al., 1996; Persons & Bertagnolli, 1999), its predictive validity has never been assessed. Indeed, quality of life measures in general and the QOLI in particular need further evaluation with respect to predictive validity, sensitivity to treatment-related change, and diverse norms for determining the amount of change needed to denote clinical significance (Berzon, 1998; Frisch, 1998b; Spilker, 1996).

Predictive Validity

Although some have decried the use of quality of life measures as an unnecessary frill compared with measures of symptoms, domain-based life satisfaction measures such as the QOLI may have the potential to predict and to identify those at high risk for health problems, relapse, and impaired functioning in school, work, and social relationships. Once identified, those at risk may be preventively treated (Frisch 1998b, in press; Frisch et al., 1992). Domain-based life satisfaction/QOL scales significantly predict such practical, “bottom-line” outcomes as
job performance and satisfaction as many as 5 years in advance (Judge & Hulin, 1993; Judge & Watanabe, 1993); job incidents; unit profitability, and productivity (Harter, Schmidt, & Hayes, 2002); school performance (e.g., functioning in high school, Valois et al., 2001; Zullig et al., 2001); healthcare expenditures (e.g., treatment costs) (Moreland, Fowler, & Honaker, 1994; Stewart, Ware, Sherbourne, & Wells, 1992; Ware, 1986); suicide (Koivumaa-Honkanen et al., 2001); deaths resulting from fatal injuries (Koivumaa-Honkanen, Honkanen, Koskenvuo, Vinamaki, & Kaprio, 2002); response of depressed patients to pharmacotherapy and the need of both medication and psychotherapy treatments for some depressed clients (Miller et al., 1998); “chronic pain syndrome” (Dworkin et al., 1992); cardiovascular diseases such as myocardial infarction (Vitaliano, Dougherty, & Siegler, 1994, for a review); other physical illnesses such as respiratory tract infections and colds in both healthy individuals and those afflicted with cancer (Anderson, Kiecolt-Glaser, & Glaser, 1994); willingness to participate in prevention programs aimed at eliminating unhealthy behaviors like smoking (Wagner et al., 1990); adolescent substance abuse (Gilman & Huebner, 2000); adolescent and adult violent and aggressive behaviors (Valois et al., 2001); peer relationship problems in adolescents (Ford, Fisher, & Larson, 1997; Gilman & Huebner, 2000); impulsive and reckless behavior such as unsafe sex practices (Kalichman, Kelly, Morgan, & Rompa, 1997); somatoform disorders (Baruffol et al., 1995; Lundh & Simonsson-Sanneck, 2001); anxiety disorders (Baruffol et al., 1995); and major depression—both initial onset and relapse.

In one of the few prospective studies of its kind and in a study using a domain-based life satisfaction measure similar to the QOLI, Lewinsohn et al. (1991) found that low life satisfaction preceded or predicted episodes of clinical depression in an underdepresed subsample of community volunteers. Participants evidenced low life satisfaction just prior to the onset of clinical depression. Life satisfaction ratings tended to become worse during the depressive episode, only to move up into the average or normal range once the depression abated. Low life satisfaction was the only variable found to be “prodromal, or an early manifestation, of depression’s onset” (p. 163) both in this study and in a prospective study of depressive relapse that followed patients after being successfully treated for depression (Gonzales, Lewinsohn, & Clarke, 1985). Like Lewinsohn et al. (1991), Frisch (1998b) offers a theory in which low life satisfaction is a distinct precursor to either successful or unsuccessful coping, with the latter leading, in some cases, to clinical depression. In keeping with the theory and the findings of Diener and others, cognitive life satisfaction judgments are distinct from either positive or negative affects, although together, these three elements constitute subjective well-being or personal happiness (Crowley & Kazdin, 1998; Diener, 1984, 2000; Diener et al., 1999; Frisch et al., 1992; Gonzales et al., 1985; Headey, Kelley, & Wearing, 1993; Lewinsohn et al., 1991; Lucas, Diener, & Suh, 1996; Lyubomirsky, Sheldon, & Schkade, in press; McNamara & Brooker, 2000; Schimmack, Diener, & Oishi 2002; Snyder et al., 2000).

Thus, life satisfaction can be seen as a cognitive construct quite independent of any mood state, although it can lead to the development of mood symptoms and is often present in acute depressive episodes (Frisch 1998b).

The results of these studies by Lewinsohn and his colleagues (1991) were corroborated and extended in a prospective study of 184 randomly selected community volunteers in which levels of life satisfaction assessed 2 years earlier significantly predicted the onset of Diagnostic and Statistical Manual (DSM)–diagnosed depressive, anxiety, and somatoform disorders (Baruffol et al., 1995). The authors concluded that low life satisfaction is a major risk factor for psychological disturbance. Similarly, Gilman and Huebner (2000) review evidence supporting the view that life satisfaction is not an irrelevant byproduct of other factors or simply part of an outcome like depression; instead, they argue, in keeping with Frisch (1998b), that low life satisfaction itself leads to significant personal and social outcomes, such as adolescent depression, substance abuse, and negative peer interactions.

The present study aimed to extend quality of life predictive validity studies to an entirely new domain by assessing the ability of life satisfaction to predict academic retention in university counseling center clients. By using the QOLI in this analysis, its predictive validity could be assessed for the first time in the literature.

Treatment Validity or Sensitivity to Treatment-Related Change

In the interest of parsimony and clarity, the cumbersome phrase sensitivity to treatment-related change may also be referred to as treatment validity. While it is a requirement for psychometric adequacy, treatment validity is not always documented for quality of life measures (Frisch, 1998b; Ogles et al., 1996). Only a few clinical trials and case studies (see Ford et al., 1997; Frisch 2004; Kazdin, 1993a, 2003; Paunovic & Ost, 2001; Petry et al., 2001; Woody & Adessky, 2002) have examined the QOLI’s treatment validity. In a study of cognitive-behavioral treatment for chronic and treatment-resistant social phobia, QOLI scores were low at pretreatment (9th percentile of nonclinical standardization sample) and improved significantly after therapy (Safren et al., 1997); this finding has been replicated with social phobics and extended to patients with generalized anxiety disorder (Eng, Coles,
Heimberg, et al., 2001; Eng, Coles, Turk, et al., 2001; Turk, Mennin, Fresco, & Heimberg, 2000). In a study of quality of life therapy (Frisch, in press), QOLI scores improved significantly in depressed patients with gains maintained at a follow-up assessment (Grant, Salcedo, Hynan, & Frisch, 1995). According to initial results, the QOLI seems to be sensitive to change in the National Institute on Aging’s PEARL (Project to Enhance Aged Rural Living) study insofar as the quality of life of older rural home health care patients and their caregivers improved following a psychosocial intervention aimed at improving their emotional well-being and the quality of life, whereas the quality of life of delayed treatment patients and caregivers did not (Forrest Scogin, personal communication, August 7, 2002). The present study aimed to extend these findings to larger samples in more naturalistic settings—that is, a managed care, HMO program for substance abuse and the ongoing treatment program of a university counseling center.

Clinical Norms

Clinical significance is defined both in terms of (a) a construct, such as quality of life or life satisfaction, that is deemed clinically and practically important, a basic or central aspect of a client’s experience or functioning that is easily noticeable to the client (Kazdin, 1993a; 2003); and (b) the amount of change on a measure deemed to be of clinical or practical importance (Kazdin 2003; Kendall & Grove, 1988; Jacobson & Truax, 1991; Ogles et al., 1996). In terms of the latter, change to within 1 standard deviation of a functional, nonclinical norm group or change that is 2 standard deviations or more away from a clinical, dysfunctional norm group is considered to be a clinically significant amount of change, using the most stringent standards (Kazdin, 2003; Ogles et al., 1996). Although comparisons of patients to nonclinical functional peers is the preferred “gold standard” for establishing clinical significance in the amount of change on a measure (Jacobson & Truax, 1991; Kazdin, 1998; Kendall & Grove, 1988; Miller et al., 1998; Ogles et al., 1996), clinical, dysfunctional norm groups can be necessary, as in cases of highly impaired or chronic samples in which change approaching a nonclinical sample is unrealistic even when treatment has been rather successful as in the case of patients with schizophrenic disorders or patients with very few resources such as very poor battered women (Frisch & Mackenzie, 1991). Dysfunctional norms can also be helpful in cases of overlapping nonclinical and clinical distributions (Jacobson & Truax, 1991).

Despite nationwide nonclinical norms in a sample that approximates the U.S. Census in ethnic makeup, clinical or dysfunctional norms for the QOLI are lacking. The present study tried to address this deficiency by collecting data from naturalistic samples of community mental health center (CMHC) patients and university counseling center clients.

METHOD

Validation Samples, Measures, and Procedures

University counseling center sample. The 3,638 participants in this study were composed of college students presenting themselves for counseling at a mid-sized land-grant university counseling center located in the Midwestern United States. The predominantly female (57.2% vs. 42.8% male) sample averaged 23.01 years of age (SD = 5.42). The sample was predominantly White (86.0%) with some international students (5.5%) as well as African American (4.7%), Hispanic American (2.2%), Asian American (1.3%) and Native American (0.3%) participants. The percentage of participants classified as freshmen, sophomores, juniors, seniors, graduate, and special (e.g., non-degree seeking) students was 18.4, 20.1, 22.0, 25.1, 13.2, and 1.2, respectively. Prior to being seen at the center, participants gave their informed consent for the center to gather test data and academic performance information as part of an ongoing effort at research and program evaluation.

During a 4-year period, all 3,638 clients referred for individual psychotherapy were first administered the QOLI and a demographic questionnaire prior to their first session of therapy. As part of this process, clients who had a planned termination from therapy were asked by their counselor to complete a second, posttreatment QOLI. Of the clients who had a planned termination from counseling (n = 1,505) during this period, 56.9% (n = 857) were administered a posttreatment QOLI.

In an effort to predict academic retention and assess outcome, retention status was checked in 1998 for students who had either completed counseling or dropped out of counseling in between 1995 and 1997 and in 2000 for students who had either completed counseling or dropped out of counseling between 1997 and 1999.

The time between QOLI testing and the check on students' retention status ranged from 12 months to 36 months with a mean of 24.8 months. Students who were still enrolled or had graduated at the time that their enrollment status was checked were considered "retained," whereas students who were no longer enrolled and had not graduated were considered "not retained." Of the students who completed counseling between 1995 and 1999, registration data was available for 2,245 participants. Of these, 2,179 had complete QOLI data. Of the participants with
complete data, 1,796 (82.4%) were counted as retained, and 383 (17.6) were counted as not retained. In the discriminant analysis, the most recent QOLI score the client had obtained prior to terminating services was utilized. For those students who failed to follow through on counseling, the pretest was their most recent QOLI (n = 1,568). For those students who completed a planned termination from counseling, the posttest was utilized (n = 611). Because 1 year had not elapsed since the completion of their counseling, data from 246 counselees that were used in the treatment validity analyses were excluded from the prediction of retention analyses.

Managed care substance abuse sample. To assess the QOLI’s treatment validity, a Midwestern managed care substance abuse sample was administered the QOLI at intake, discharge, and at 3-month and 6-month follow-up assessments. A demographic questionnaire was also administered at intake; follow-up assessments were administered by mail. Of 90 participants, 67% were admitted for outpatient treatment (M duration = 71 days), and 33% were admitted for inpatient treatment (M duration = 19 days). The predominantly male (73.33% vs. 26.66% female) sample averaged 38.50 years of age (SD = 9.20). The sample was overwhelmingly White (94.4%) with a few (5.6%) African American, Hispanic American, Asian American, and Native American participants. The percentage of participants married, divorced, widowed, or single was 28.9, 17.8, 13.3, and 38.9, respectively.

As clients first entered the treatment program at intake, they were asked for their informed consent to participate in the study. Data collection stopped after 90 participants successfully completed the program. In addition to the 90 clients who successfully completed treatment and agreed to participate, 5 clients did not wish to participate, and 2 dropped out of treatment prematurely—data from these 7 clients are not included in these analyses. Of the 90 participants, 82 (91.11%) were treated for alcohol dependence and 8 (8.88%) were treated for methamphetamine, cocaine, benzodiazepine, cannabis, or opioid dependence.

Community Mental Health Center (CMHC) sample. This sample of 199 patients was tested to obtain normative statistics on the QOLI for a CMHC. The predominantly female (63.6% vs. 36.4% male) sample averaged 34.52 years of age (SD = 9.85). The sample was predominantly White (71.6%) with significant African American (17.6%) and Hispanic American (10.8%) representation. All of the Hispanic American participants were Mexican American. The percentage of participants married, separated, divorced, widowed, or single was 19.8, 6.4, 30.7, 3.0, and 40.1, respectively.

Until such time that about 200 participants gave their informed consent to participate, all clients presenting for treatment at a CMHC in the greater Waco area of about 200,000 inhabitants were first administered the QOLI. Twenty clients were unable or unwilling to participate because of illiteracy or acute agitation, and 2 patients submitted data with missing values that were unusable; thus, data from 221 patients yielded usable data for 199 participants. A demographic questionnaire was completed archivally at a later date on the basis of clients’ medical records.

RESULTS

Normative Statistics for Clinical Samples

CMHC norms. The QOLI normative statistics for the CMHC sample are presented in Table 1. A one-way ANOVA of QOLI raw scores revealed a significant difference in terms of ethnicity, F(2, 192) = 5.46, p < .01, effect size (eta^2) = .05, such that Mexican Americans scored higher than either Whites or African Americans, according to Bonferroni-adjusted contrasts. Whites and African Americans did not differ significantly. Because the magnitude of effect calculated for the observed ethnic difference in QOLI scores did not even meet Cohen’s (1988) threshold for a “weak” effect, separate norms for Mexican Americans do not seem necessary in interpreting the scores of CMHC patients. Women and men did not differ significantly in QOLI scores, F(195) = 1.68, p > .05.

Counseling center norms. The QOLI normative statistics for the counseling center sample are presented in Table 1. Ethnic differences in pretreatment QOLI scores were not statistically significant in the counseling center sample, F(6, 3,015) = 0.86, p > .05, supporting the practice of using aggregate norms—in terms of ethnicity—for college counseling center clients. While men from the counseling center scored significantly higher on the QOLI than female counselees, F(1, 3,634) = 14.89, p < .001, effect size (eta^2) = .004, the effect size was so small that separate norms for male and female counselees do not seem to be necessary. In terms of class standing, freshman counselees scored higher on the QOLI than junior, senior, graduate, and special students, and sophomores scored higher than senior and graduate students, F(5, 3,028) = 14.99, p < .001, effect size (eta^2) = .024, followed by Bonferroni-adjusted pairwise tests. Once again, the effect size for class standing was so small that separate norms for freshman or sophomore counselees do not seem to be necessary.

Use of clinical norms. As with Derogatis (1994), Derogatis and Fitzpatrick (2004), and others (Maruish, 1999), the normative statistics presented in Table 1 are taken as somewhat representative of CMHCs and univer-
sity counseling centers because all participants presenting for treatment were administered the QOLI prior to their first session; in this way, the norms may reflect an adequate sample of typical patients from these settings. Clients’ whose scores after treatment match or exceed the cutoff scores in Table 1 may be said to have demonstrated “clinically significant change” in that their score has moved 2 standard deviations or more away from the dysfunctional, clinical mean (Ogles et al., 1996). In other words, a score at or above the cutoff in Table 1 denotes a positive treatment outcome (Ogles et al., 1996).

### Treatment Validity

**Counseling center sample.** Evidence in support of the QOLI’s treatment validity is displayed in Table 2. According to the results of a correlated t-test, QOLI raw scores increased significantly from pretreatment to posttreatment in the counseling center sample, \( t(857) = -20.23, p < .001, \) effect size = .57. When evaluating the between-group differences, caution was not to emphasize differences that were statistically but not clinically significant; for this reason, Cohen’s (1988) cutoffs—.20 standard deviation units for a small or “weak,” but important, effect size; .50 for a “moderate” effect size and; .80 for a “large” effect size— were used in analyzing results. Thus, the effect size of .57 was evaluated as moderate.

**Managed care substance abuse sample.** Treatment validity data from the managed care substance abuse sample is presented in Table 2. The repeated measures ANOVA for the QOLI administered at pretreatment, posttreatment, and 3- and 6-month follow-up assessments to the managed care substance abuse sample was significant, QOLI \( F(3, 38) = 8.97, p < .001, \) effect size = .42 (see Table 2 for means and standard deviations). Bonferroni-adjusted pairwise comparisons revealed a significant increase in QOLI raw scores from pretreatment to posttreatment that was maintained at 3- and 6-month follow-up assessments.

### Predictive Validity of the QOLI

**Validation sample results.** Using the cross-validation approach of Butcher and his colleagues at the University of Minnesota (Rouse, Butcher, & Miller, 1999), a discriminant analysis was conducted to determine the predictive utility of clients’ QOLI scores and cumulative grade point average (GPA) in assessing academic retention to 3 years in advance (see Method section for procedural details). The sample of 2,179 participants was randomly divided into two halves, with 1,089 participants in the validation sample and 1,090 participants in the cross-validation sample. The mean GPA and QOLI scores of the two samples did not differ significantly.

Three discriminant function equations were generated from the validation sample, with GPA and QOLI scores considered separately as predictors of retention, followed by a stepwise discriminant analysis in which both variables were included. These three equations, each of which was statistically significant, and their associated group centroids are presented in Table 3. Efficiency statistics are presented in Table 4. All three discriminant equations and both of the predictor variables in the third equation reached statistical significance at a level of \( p < .001. \) The classification ratio and all efficiency statistics were highest for the stepwise analysis containing both GPA and QOLI scores, which had standardized beta weights of .82 for GPA and .55 for the QOLI.

Table 5 contains the classification rates from the stepwise discriminant function; 69.5% of the cases were
correctly classified when both GPA and QOLI scores were considered. In a two-sample case with equal membership in each group, the percentage of correct predictions based on chance would be 50%. When the group sizes are unequal, however, as they were in this study with 898 or 82.4% of students retained and 191 or 17.6% students not retained, the percentage of correct predictions based on chance is higher than 50%. In cases with unequal distributions, Betz (1987) recommends two methods for determining the chance rate of correct prediction. If the risk of misclassification is equal for both groups, the formula \(n/N\) (where \(n\) is the size of the largest group, and \(N\) is total sample size) is appropriate. In this case, that would result in a chance rate of prediction of \((898/1,089)\) 82.4%. However, that would classify all students as likely to be retained. In this situation, where the cost of misclassifying a student as retained when they are likely to drop out is higher than the reverse, Betz suggests using a formula that assumes a comparable rate of error across all groups: \(p_1a_1 + p_2a_2 + p_3a_3 + \ldots + p_ka_k\) (where \(p = \) proportion of cases in each group, \(a = \) proportion actually classified in that group, and \(k = \) the number of groups). In this case, the formula would calculate a chance rate of correct prediction of (.175)(.342) + (.825)(.657) = 59.3%. The 69.5% rate of correct prediction using the discriminant function is significantly higher than the 59.3% chance rate of correct prediction, according to the \(z\) test for the difference in proportions (Glass & Stanley, 1970; \(z = 6.84, p < .05\)). Thus, the discriminant function was significantly more accurate than chance in predicting which students would not be retained. This finding is corroborated by the significant Wilks's lambda for the stepwise discriminant function, Wilks's lambda = .909, with a chi-square distribution of \((2) = 103.585, p < .001, R = .302\). Thus, significant differences in the group centroids were found, with the predictor variables (GPA and QOLI) accounting for 9% of the variance in retention.

Cross-validation sample results: Discriminant analysis is a maximization procedure that capitalizes on random, sample-specific error (Betz, 1987; Klecka, 1980). For this reason, a prediction equation developed on one sample may not be as effective when utilized with a subsequent sample. To address this problem, the second half of the sample was used to cross-validate the discriminant equation generated with the first sample. Using the discriminant function generated by the initial stepwise procedure (GPA [.948] + QOLI [.313] - .012), we classified each subject in the cross-validation sample as retained or not retained. The correct classification rate for the cross-validation sample was 69%, compared with 69% for the validation sample. The efficiency statistics generated for the cross-validation sample—sensitivity = .698, specificity = .689, percentage of subjects in the group predicted “not retained” who actually were not retained (PPP) = .324, percentage of subjects in the group predicted “retained” who actually were retained (NPP) = .914—actually increased in accuracy from those of the validation sample, suggesting no shrinkage when the prediction equation from the first sample was applied to the second sample.

DISCUSSION

In terms of overall results, (a) clinical norms for CMHCs and university counseling centers were generated for the QOLI that supplement existing nationwide, nonclinical norms; (b) further evidence for the QOLI's treatment validity was found—that is, the QOLI was found to be sensitive to treatment-related change in two naturalistic clinical settings and samples: a managed care/substance abuse and a university counseling center setting;
and (c) the predictive validity of the QOLI was supported in terms of its ability to predict academic retention both by itself and in conjunction with cumulative GPA 1 to 3 years in advance.

The QOLI was found to be sensitive to treatment-related change in two clinical samples. In both the managed care/substance abuse and counseling center samples QOLI scores increased significantly with treatment and moved to within 1 standard deviation of the functional, nonclinical normative sample mean after treatment—from a mean T-score of 38 to a score of 47 for both samples at posttest with scores of 48 and 50 at the 3- and 6-month follow-ups for the managed care/substance abuse sample. This change signifies a clinically, and not just a statistically, significant amount of change in that scores further than 1 standard deviation from a nonclinical norm mean moved to within 1 standard deviation of that mean, recalling that mean for standardized T-scores is 50 with a standard deviation of 10. Of course, this finding is positive only to the extent that the QOLI measures a construct that is distinct from other commonly used outcome variables, such as psychiatric symptoms or depression. Life satisfaction in general and the QOLI in particular have been found to be discriminable from the constructs of psychiatric symptoms, negative and positive affect, depression, and anxiety in both clinical and nonclinical samples (Crowley & Kazdin, 1998; Diener, 2000; Frisch et al., 1992; Gonzales et al., 1985; Headley et al., 1993; Lewinsohn et al., 1991; Lucas et al., 1996; McNamara & Brooker, 2000; Schimmack et al., 2002; Snyder et al., 2000).

Disagreement exists as to how quality of life results should be interpreted (Frisch, 1998b, 2004, in press; Spilker, 1996). While quality of life in psychiatry is increasingly defined in terms of the rather psychological construct of life satisfaction, which assumes some cognitive mediation of quality of life judgments, general medicine and the pharmaceutical industry almost always ignore the psychological aspects of quality of life by defining it exclusively in terms of functional abilities or impairments as measured by either the ‘Standard Form’ or the SF-12 or SF-36 (Niemcryk, 2001; Ware, 2004). Thus, in addition to a cure or management of symptoms/disease/disability, there is a desire to see a patient’s ability to function in everyday life enhanced or at least maintained after treatment. Unfortunately, such measures of functioning can be misleading and can miss deep dissatisfaction and a very low quality of life as in patients with anxiety disorders who are extremely dissatisfied and unhappy with their life even though their functioning is only mildly or moderately impaired (Eng, Coles, Turk, Heimberg, et al., 2001; Turk et al., 2000—also see Frisch 2004; McNamara & Brooker, 2000). For example, the SF-36 is not significantly correlated with the QOLI in a sample of patients screened for bariatric surgery (Lana Bouchacoff, personal communication, June 11, 2004). In addition, patient concerns about functional impairments often dissipate with time as patients partially adapt to even such severe disabilities such as paraplegia and blindness (Diener et al., 1999; Lyubomirsky, Sheldon, et al., in press). Thirdly, life satisfaction can improve without changes in life circumstances or functional abilities (Frisch 1992, 1998b, in press); life satisfaction is a function of attitude and expectations and not just “objective” factors. Diener and Seligman (in press) exhaustively review studies and show little if any relationship between objective and subjective quality of life indicators (also see Lyubomirski, Sheldon, et al., 2000, for a review of cognitive and intentional factors influencing happiness, QOL, and life satisfaction). In this regard, perhaps impairments in functioning that do not affect life satisfaction should not be considered in quality of life assessment to begin with. Thus, from a psychological perspective, particular functional impairments may or may not discourage, demoralize, or ruin patients’ basic contentment or quality of life, suggesting the need to assess life satisfaction, happiness, “subjective well-being,” or well-being (Diener, 2000; Diener & Seligman, in press; Diener et al., 1999; Frisch 1998a, 1998b, 2004) to fully assess quality of life—that is, whether life satisfaction replaces measures of “functional ability” or supplements them as part of a “quality of life assessment battery” (Frisch 1998b).

Alternatively, life satisfaction may be viewed as a cognitive/experiential “function” in its own right worthy of inclusion in such popular instruments as the SF-36 or SF-12. That is, life satisfaction may reflect a consciousness “function” or functional ability in which a general...
sense of satisfaction or contentment (a) makes a person's conscious inner experience pleasant, (b) motivates him or her to pursue goals, and (c) makes him or her attractive to friends and loved ones who then may share resources and social support (Diener, 2000; Folkman & Moskowitz, 2000; Frisch, 1999b; Lazarus, 1991; Lyubomirsky, King, Diener, in press). If, as Hans Strupp (1996) maintains, basic contentment—defined as life satisfaction—is the most important sign of mental health and positive outcome in psychology and psychiatry, it could be recast as a vital human function along with the abilities to love, work, and toilet oneself. Thus, one's basic contentment, satisfaction with life, or subjective well-being may be impaired by illness, injury, or psychiatric disorder in the same way that one's ability to drive or work may be impaired.

Since "the ultimate purpose of all health interventions (that is, medical and psychological—Kazdin, 1993a) is to enhance patients' quality of life" (Jenkins, 1992, p. 367—also Diener and Seligman, in press), quality of life interventions (also quality of life assessments) may be implemented to (a) augment the effects of disorder- or disease-specific treatments on quality of life in both the acute and relapse prevention phases of treatment (see Frisch, in press, for illustration with Beck's cognitive therapy), (b) to minimize the negative quality of life side effects of some treatments such as chemotherapy or prolonged exposure, and (c) to enhance patients' quality of life in areas that have little or nothing to do with their malady but nevertheless compensate for the quality of life decrements caused by the malady or its treatment. Additionally, quality of life interventions have a place in the burgeoning field of positive psychology in which professional groups at risk, such as lawyers, can benefit from quality of life—also known as well-being or positive psychology—interventions (for example, Diener, 2003, makes this points and he uses these terms interchangeably).

The results of the present study extend the predictive validity of life satisfaction in general and the QOLI in particular to an entirely new domain—that is, the QOLI was able to significantly predict academic retention both by itself and in conjunction with cumulative GPA 1 to 3 years in advance. This finding lends further credence to the view that life satisfaction may be a "transtheoretical" and interdisciplinary construct of great heuristic and practical value (Frisch et al., 1992). On the basis of findings here and studies reviewed above, research is called for in which quality of life or well-being measures are used in schools, businesses, employee assistance programs (Frisch, 1998a), and clinics/hospitals—both general medical and mental health—to assess their potential to screen those at high risk for job or school failure, particular mental disorders (i.e., depressive, anxiety, substance use, and somatoform disorders), suicide, general medical conditions, respiratory infections, heart disease, cancer, and excessive health care utilization and expenditures. Except for the present study, such screening has not been studied in everyday clinical and social settings. When used in connection with job or school well-being, independent of health—as suggested by Frisch et al. (1992)—these studies may be viewed as part of the positive psychology movement to study and to enhance the happiness of the general population (Diener, 2003; Seligman, 2002).

In the context of college counseling centers, the QOLI may be used as a harbinger of academic failure that can alert both psychologists and clients to the need for aggressive intervention (Frisch, 1998a, in press; Frisch, Elliot, Atsadies, Salva, & Denney, 1982; Frisch & Froberg, 1987; Frisch & Gerrard, 1981). Specifically, a counseling center clinician may enter the QOLI score and the cumulative GPA of a counselee into the stepwise function or equation in Table 3 and either predict that a student will drop out of school if the solution to the equation is closest to the "not retained" centroid of 0.685 or predict retention if the solution to the equation is closest to the "retained" centroid of 0.146. In an era of shrinking budgets and increased demands for service, measures like the QOLI may also provide the "proof" and accountability that funding agencies are demanding if health care services are to be maintained or expanded; QOLI results have already been used successfully to secure additional resources and staff in university counseling centers (Clark & Mason, 2001).

Whereas academic retention and nonretention are usually measured in terms of enrollment or graduation and withdrawal from the university before earning a degree (e.g., Pidcock, Fischer, & Munsch, 2001; Svanum & Zody, 2001; Ting, 2000; Turner & Berry, 2000; Wilson, Mason, & Ewing, 1997), it is possible that some who withdraw do so for reasons unrelated to low life satisfaction or a low GPA. This criterion measure of retention/nonretention may be enhanced in future research; for example, dropouts from an institution may be interviewed to ascertain their reasons for disenrolling and may be followed to see if, when, and where they rematriculate. Future studies could also describe their clinical norm groups in terms of diagnosis by performing structured DSM interviews on each participant as initial chart diagnoses, when available, tend to be unreliable (Rush, 2000; Summerfeldt & Antony, 2002); this may explain why some authors do not report diagnoses for CMHC norm groups (for example, see Derogatis, 1994).

The present findings are limited to one measure and to one type of quality of life assessment—namely, life satisfaction (see Frisch et al., 1992, and Frisch & Higgins, 1986, for other types). Life satisfaction seems to predict future problems in health and functioning whether in prospective or in discriminant analysis studies such as that re-
ported here. Despite its predictive value and discriminability from depression and other psychiatric symptoms, life satisfaction may reflect the influence of "third variables" on adjustment, thereby challenging current theories of its causal significance (e.g., Diener et al., 1999; Frisch, 1998b, in press; Gonzales et al., 1985; Lewinsohn et al., 1991). It is important that research into third variables be prospective or longitudinal when possible as high correlations are to be expected and are not always meaningful during the acute phase of many disorders or diseases (e.g., see discussion of Lewinsohn et al., 1991, above).

The factor structure and treatment utility of the QOLI have yet to be evaluated. The treatment utility or "treatment-planning utility" (Frisch, 1992) of a measure refers to its contribution to a positive treatment outcome, usually by facilitating the ease, efficiency, or accuracy of assessment, treatment planning, and/or treatment (Hayes, Nelson, & Jarrett, 1987). In this vein, the QOLI was designed to screen for "problems in living" (as well as for assets and strengths in everyday functioning) just as symptom checklists screen for disorders and diseases. Problems-in-living assessment is particularly important in cognitive therapy (Frisch, 1992; Persons & Bertagnoli, 1999), substance abuse (the use of the QOLI in harm/benefit assessment and motivational interviewing is being explored by Stephanie O'Malley [personal communication, May 17, 2004] and Morgenstern, Labovitz, McCrady, Kraler, & Frey, 1997), and managed care settings where about 75% of patients present with problems in living and related adjustment, depression, and anxiety concerns (Ben-Porath, 1997; Ludden & Mandell, 1993).

Persons and Bertagnoli (1999) report that the use of the QOLI enhances the accuracy of cognitive-behavioral case formulations in clinicians who typically fail to identify clients problems-in-living relevant to their depression (also see Ben-Porath, 1997). While anecdotal reports from the current samples and from several hundred patients treated elsewhere are positive (e.g., Kazdin, 1993a, 2003; Frisch, 1992, 1998b, in press), the QOLI’s treatment utility should be systematically assessed, perhaps via the "manipulated assessment strategy" in which the outcome of clients treated with and without information from the QOLI could be compared (Hayes et al., 1987). Treatment utility may also be more broadly defined and assessed by simply surveying clinicians about the extent to which the QOLI facilitates assessment, treatment planning, and treatment per se.

Finally, the QOLI was designed for both clinical and nonclinical uses (Frisch et al., 1992). In a positive psychology vein, the QOLI has been listed as a "recommended positive psychology questionnaire" on M. E. P. Seligman's positive psychology Web site (see http://www.psych.upenn.edu/seligman/pospsych.htm) and has been used to evaluate outcome and to plan interventions for a positive psychology approach called Quality of Life Therapy and Coaching (Frisch, 1998b, in press). The intervention utility of the QOLI in this and other positive psychology programs aimed at personal growth and increased life satisfaction, happiness, well-being, and quality of life could be evaluated in the same way that the QOLI’s clinical or treatment utility is studied.

REFERENCES


Michael B. Frisch, Ph.D., is a professor and core clinical faculty in Baylor University’s Department of Psychology and Neuroscience. He serves on the Board of the International Society for Quality of Life Studies and is interested in the integration of quality of life, positive psychology, and cognitive therapy in regard to both assessment and intervention.

Michelle P. Clark, Ph.D., is a psychologist and consultant in private practice. She was formerly a staff member at the student counseling service at Iowa State University, fulfilling the roles of coordinator of program evaluation and research, clinical director, associate director, and interim director. Her research interests include psychotherapy outcome, clinical supervision, and the work-related effects of pregnancy. Her private practice includes organizational and administrative consulting; she specializes in psychotherapy with women’s issues, especially trauma and eating disorders.

Steven V. Rouse, Ph.D., is an associate professor of psychology at Pepperdine University. His teaching emphasis is in the area of individual differences, particularly personality and psychological assessment. His current research emphases span both normative and pathological personality differences, including validation studies of psychological tests, the accuracy of personality perception, and the stability of self-schema descriptions.

M. David Rudd, Ph.D., ABPP, is professor and chair at the Baylor University Department of Psychology and Neuroscience. His research addresses broad issues in clinical suicidality, cognitive therapy, and licensure and regulation in psychology.

Jennifer K. Paweleck, Psy.D., is in private practice in Sierra Vista, Arizona.

Andrew Greenstone, Psy.D., received his doctorate from Baylor University. He resides in Austin, Texas, where he runs a group private practice specializing in the treatment of geriatric patients residing in nursing homes and assisted living facilities. Additionally, he has served as contract manager for the largest employee assistance program contract in the state of Texas.

David A. Kopplin is professor emeritus at Baylor University. For 29 years, he taught interpersonal group and individual psychotherapy in Baylor University’s Psy.D. program. He has maintained a private practice since 1969. His interests are in professional training of practicing psychologists and in interpersonal and group processes. He received a Ph.D. in clinical psychology from Michigan State University and a master’s in public health from the University of Michigan.