

Life Values Inventory

Facilitator's Guide



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INTRODUCTION AND OVERVIEW

Values have long been viewed as important determinants of human behavior (Allport, Vernon & Lindzey, 1960; Rokeach, 1973; Super, 1990). Moreover, values have been empirically linked to important aspects of organizational behavior (Meglino, Ravlin, & Adkins, 1989), academic performance (Coyne, 1988), career decision making (Ravlin & Meglino, 1987), and marital satisfaction (Vaitkus, 1995). They have also been identified as important determinants of culturally unique behavior (Sue & Sue, 1990), and thus are critical to the understanding of cultural differences. In spite of the demonstrated influence of values on human functioning, career counselors, marriage counselors, health educators, organizational psychologists, and others have typically not used values measures because of the absence of an empirically based, easily administered and scored values inventory. The *Life Values Inventory* (LVI; Crace & Brown, 1996) was developed to fill this void.

Historically, values inventories have been developed either as general measures of values (e.g. Allport, Vernon, & Lindzey, 1960) with no direct link to life roles, or as work values inventories (e.g. Nevill & Super, 1986) with relationships to the work role only. Work values inventories encourage practitioners and others to ignore other life roles in the career planning process, which seems inappropriate given the interactions that occur between the work role and other life roles. On the other hand, inventories such as the *Rokeach Values Survey* (Rokeach, 1973) have limited utility because they provide no crosswalks to make decisions about careers, suitable marital partners, leisure activities, and so

forth based on the results. The LVI is an attempt to bridge the chasm between work values inventories and general values inventories by producing a values inventory that can be used as a decision-making aid by people who are grappling with decisions regarding work, education, relationships, and leisure.

The LVI is also an attempt to promote holistic thinking in the decision-making process. For too long practitioners have focused on one role at a time as they assisted people to make career selections, deal with marital problems or choose from among leisure activities. Hopefully, practitioners who use the LVI will eschew focusing on one role in favor of a holistic approach to role-related decision making.

Defining Values

The first step in the process of developing the LVI was to adopt a definition of values. Milton Rokeach's (1973) definition of values has been adopted. He defined values as *standards that not only guide the behavior of the individuals who hold them, but serve as their basis for judging the behavior of others*. Rokeach differentiated values from interests on two grounds: the role of values as standards, and the number of values people have versus interests. Interests are preferences or likes, not standards against which individuals judge their own behavior as well as the functioning of others. Moreover, individuals may develop dozens of interests, but they develop relatively few values. Needs may also serve as a guide to behavior, but according to Rokeach (1973), needs are

transitory, and once satiated, may not influence behavior for varying amounts of time. Values develop so that individuals can meet their needs in socially acceptable ways, but unlike needs, transcend situations and are stable influences on behavior. Finally, not only do values provide individuals with a basis for judging the appropriateness of their behavior in the present, they provide individuals with a sense of what ends they would like to attain in the future. Values, once developed, become the primary basis for goal setting.

Theoretical Underpinnings

Brown's Holistic Values-Based Theory of Life Role Choice and Satisfaction (Brown, 1996; Brown & Crace, 1995) underpins the LVI. This theory draws on Rokeach's (1973) theory and research, as well as some aspects of Super's (1990) theory, to explain the decision-making process and the satisfaction that results from role related decisions. The basic propositions of the theory are as follows:

Each person develops a relatively small number of values that are organized into a dynamic values system. Rokeach (1973) suggested that there are 36 human values, but factor analysis of his work suggests the number is much smaller (Braithwaite & Law, 1985). The LVI measures 14 values that are guides to behavior as people make important life decisions.

Crystallized, highly prioritized values are the most important determinant of life role choices so long as values-based information regarding the choices is available. Crystallized values have meaningful labels and definitions that can be used by individuals to describe themselves. In the event that none of the options available will satisfy the values of the decision maker, the option that conflicts least with strongly held, highly prioritized values will be selected. Research by Ravlin & Meglino (1987) and Judge and Bretz (1992) strongly suggests that, when options that are related to the strongly held

values of the decision-maker are available in the decision-making process, those options are frequently chosen. Moreover, Schulenberg, Vondracek, and Kim (1993) found that certainty of career choice was directly related to the strength of the values held by the individuals they studied.

Values are the dominant factor in the decision-making process, but other factors influence decision making as well. Self-efficacy and interests will also have an impact on decision making (Bandura, 1986; Feather, 1988; Rokeach, 1973). Feather (1988) investigated the career choice making of college students and found that, while values were the dominant factor in the decision-making process, self-efficacy became a factor when one of the options being considered was viewed as more difficult to attain than the others being considered.

Because of the diverse sources of information and experiences that influence values development, it is likely that each person will have values conflicts. When competing values come into play in the decision-making process the result will be ambivalent feelings and perhaps procrastination. This hypothesis has not been tested directly.

Because of differences in their socialization process and the values laden information they receive, males and females and people from various cultural backgrounds are apt to develop differing values systems. Cross-cultural studies of values by Brenner, Blazini, and Greenhaus (1988), Leong (1991), and others have shown that values vary by gender and ethnicity.

Life satisfaction will be more than the sum of the products of the life roles filled taken separately. This hypothesis has not been tested at this time, although Hesketh (1993) and others have written in support of this idea.

Life roles interact in characteristic fashions. They may interact synergistically (complementary), entropically (conflicting), or interact to maintain homeostasis (supplementary) (Super, 1980). In a direct test of this hypothesis, Pittman and Orthner (1988) found that job commitment could

be predicted by perceptions of the extent to which the organization was perceived to be supportive of their families. In another related study, Watson and Ager (1991) found that the frequency with which people between the ages of 50 and 90 performed valued life roles was directly related to life satisfaction. Finally, O'Driscoll, Ilgen, and Hildreth (1992) found that there were negative links among the amount of time spent on the job, factors that interfered with the job, and satisfaction with off-the-job roles.

The salience of a single role can be determined by the extent to which that role satisfies crystallized, highly prioritized values. However, few people will have all of their values satisfied in a single role. When more than one role is required to satisfy values, the salience of values in the values systems shifts dynamically as the person moves from role to role because of the expectation that different values will be satisfied in different roles. Flannelly (1995), who used a modified version of the LVI in his research, found that when people rated the values they hoped to satisfy within various roles, their ratings varied significantly from role to role.

Success in a life role will be dependent upon (1) the congruency between the individual's values and those of others in the role; (2) role-related skills the person has developed prior to entering the role; (3) the aptitudes possessed by the person in the role to change as the demands of the role change; and (4) the nature of the interaction of the role with other roles occupied by the individual. Ravlin and Meglino (1987) found a direct relationship between the congruence of supervisors and workers values and job satisfaction. Research on the Theory of Work Adjustment (Dawis & Lofquist, 1984) has also been supportive of this proposition.

Several types of values-based problems develop that require therapeutic interventions. These include (1) values poorly crystallized and/or poorly prioritized; (2) intrapersonal values conflicts; (3) intrarole values conflicts; (4) interrole conflicts that may or may not be values-based; and (5) perceptions that values satisfaction is blocked resulting in depression. Approaches to dealing with these

problems will be addressed in Chapter Four. This proposition has not been tested directly at this time.

Overview of the LVI

LVI Content

The LVI contains 42 items that measure 14 relatively independent values. The values measured by the LVI are Achievement, Belonging, Concern for the Environment, Concern for Others, Creativity, Financial Prosperity, Health and Activity, Humility, Independence, Interdependence, Objective Analysis, Privacy, Responsibility, and Spirituality. These scales are defined in Chapter Three. It takes approximately 20 minutes to complete the LVI.

Assessment Methods

In the process of taking the LVI, people are asked both to rate the strength of their values and to rank them in order of importance. Rankin and Grube (1980) concluded that, while rating and ranking methods produce many of the same findings, each has its place in the measurement of values. Thompson, Levitov, and Miederhoff (1982) were more specific. They concluded that ranking methodology is preferred when information about the values held by the individual is desired, but that when values inventories are used in research to investigate group perceptions of values, rating methods of assessment are preferred. Accordingly, people taking the LVI are first asked to rate the degree to which the beliefs contained in the 42 items are current guides to their behavior. The next step in the assessment process is for individuals to rank order their most important values. The final step in the process is for each individual to rank the importance of the values they hope to have satisfied in each of three life roles: Work, Important Relationships, and Leisure and Community Activities. A copy of the *Life Values*

Inventory (1996 & 2002 versions) can be found in Appendix A.

Psychometric Properties

Information regarding the technical development of the LVI can be found in Chapter Two. The scales of the LVI were selected on the basis of a series of factor analytic studies. Many of the existing values inventories contain scales that are highly correlated, sometimes exceeding .50. Because intercorrelations of this magnitude confound the interpretation process, one objective in the development of the LVI was to produce values scales that were relatively independent. Two methods were used to determine the reliability of the scales of the LVI, test-retest and internal consistency using Cronbach's alpha. As will be seen in Chapter Two, both types of reliability coefficients are in the satisfactory range. The validity of the LVI was determined using traditional convergent and divergent validity checks as well as a more rigorous predictive validity check.

Cultural Sensitivity

As noted above, one of the objectives in the development of the LVI was to produce an instrument that has acceptable psychometric properties. However, a second objective was pursued just as vigorously: To produce a culturally sensitive instrument that could be used with confidence with both genders and all major cultural groups. To attain this end, the LVI was subjected to two rounds of reviews by knowledgeable representatives of several cultural groups and subgroups. At various stages of development of the instrument, feedback was

received from professionals who were aware of the issues involved in measuring values in various cultural groups, including representatives from African American, Asian American, Hispanic, and Native American cultures. The items and directions were also reviewed to determine whether they were sensitive to the unique concerns of women.

Uses of the LVI

The LVI was developed for use in couples counseling, career counseling, retirement counseling and planning, leisure counseling, team building (either in sport or the workplace), and other activities in which decision making and/or interpersonal functioning is important. A fuller description of the uses of the LVI can be found in Chapter Four.

Summary

The LVI was developed to serve as an aid in making decisions about life roles. It measures 14 normal human values that guide behavior. The LVI is predicated on the proposition that people function holistically, and that when making a decision regarding one's life role, the influence of that decision on the other roles in which the person is engaged should be considered. In the chapters that follow the evolution of the LVI will be discussed and its psychometric properties will be presented (Chapter Two), administration and interpretation will be explored (Chapter Three), and uses of the LVI in counseling, therapy, and team development will be outlined (Chapter Four).

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DEVELOPMENT OF THE LIFE VALUES INVENTORY

As noted in Chapter One, the LVI was developed for use with people who are confronting role related decisions such as choice of a career, leisure or relationships. The development of the Life Values Inventory occurred in several stages, all of which are described in this chapter.

Stage One Dimensionality of Values

The purpose of the initial study was to use the sequential system model (Jackson, 1970), more commonly known as the rational approach to test construction, to develop a values inventory. In this approach, items are generated on the basis of a conceptual framework but are retained on the basis of their psychometric properties and empirical relationships (Golden, Sawicki & Franzen, 1984; Jackson, 1970).

Item Development

Initially, items for the LVI were developed by examining the following sources for values content, that is, beliefs that guide behavior: personality, values, and interest inventories; popular self-exploration and career development books; values clarification exercises; opinions of college students and faculty members, and items

generated by the researchers. An initial pool of 190 items was developed.

Each of the 190 items was evaluated by the researchers according to the following criteria: (1) corresponds to the operational definition of values; (2) reflects the general core of values that can be ascribed to an activity or event; (3) redundancy; and (4) clarity. Thirty-nine items were deleted as a result of this review leaving a pool of 151 items. The remaining items were presented to graduate level classes in counseling and school psychology, and to practicing career counselors for review of their clarity. Ten items were deleted as a result of the feedback from these groups, leaving a total of 141 items.

Scaling

A five point Likert scale with markers for 1, 3, and 5 was used in constructing the first draft of the inventory. The markers were: 1=almost never guides my behavior; 3=occasionally guides my behavior; 5=almost always guides my behavior.

Sample

The sample used in the initial stage of development of the LVI was comprised of 266 university students (63.5%) and 153 community college students (36.5%) for a total of 419

subjects. The ages of the subjects ranged from 18 to 55 years with 78.7% of the sample ranging from 18 to 22 years (N=328; M=22.49). The sample was comprised of 254 females (60.6%) and 159 males (40.0%). Six cases (1.4%) could not be classified according to gender due to missing information. The ethnic distribution of the sample was as follows: Caucasian (N=346, 82.6%), African American (N=58, 13.8%), Native American (N=4, 1.0%), Asian Pacific American (N=4, 1.0%), and Hispanic (N=3, 0.7%). Two individuals (0.5%) identified themselves as Other and two cases (0.5%) could not be classified. All inventories were administered in classroom settings.

Analyses

To identify the latent dimensions represented by the original variables of the LVI, a sequence of principal axis factor analyses with promax rotation was carried out. Scree plot analysis, hyperplane count and examination of the rotated matrices were used to estimate the number and nature of latent variables of the LVI. Following each analysis, items were removed if they exhibited a double or low loading, with the loading and correlation criteria being greater than, or approaching .40. Factors with one or two items were also eliminated.

Internal consistency was assessed using two methods. Cronbach's alpha was calculated to examine the internal consistency of each factor. A second estimation of the internal consistency of the solution was the squared multiple correlations (SMC) of the factor scores predicted from scores on the observed variables. High SMC values indicate stability of factors in that the observed variables account for substantial variance in the factor scores and is thus considered a viable assessment of internal consistency (Bollen, 1989; Tabachnick & Fidell, 1983).

Results

Factor structure. A sequence of principal axis factor analyses was run on the 141 item inventory. Kaiser's measure of overall sample adequacy was .869, deemed meritorious (Kaiser, 1974). Scree tests of the eigen values, hyperplane counts, and the criteria for interpretability all indicated that 10 factors with 45 items yielded the best solution and approached simple structure. The percentage of the total variance accounted for by the 10 factor solution was 57.88%.

The highest inter-factor correlation was .393, indicating that the use of the oblique rotation matrices was indicated for factor interpretation. However, interpretation of the oblique factor pattern was nearly identical to the orthogonal factor pattern. Six of the factors derived from the analysis included five items each, while three factors included four items, and one factor was comprised of three items, for a total of 45 items. The 10 factors identified listed in descending order using amount of variance accounted for as the basis for the ordering are: Financial Prosperity, Spirituality, Altruism, Scientific Inquiry, Affiliation, Order, Solitude, Physical Expression, Creativity, and Independence.

Internal consistency. The measures of internal consistency for the 10 factors derived from the Stage One Analyses were generally satisfactory. Cronbach's alphas for the factors ranged from .643 for Independence to .892 for Spirituality. The values of the SMC's ranged from .714 for the Independence factor to .916 for the Spirituality factor.

Stage Two Testing the Model

Sample

The revised, 45 item LVI was administered to 396 university students (46.8%), 226 technical-community college students (26.7%), and 225

corporate employees or trainees (26.6%) for a total of 847 people. The ages of the people involved in the study ranged from 18 to 67 years with a mean age of 24.69 years. The sample was comprised of 564 females (66.6%) and 265 males (31.3%). Eighteen cases (2.1%) could not be classified because of missing data. The ethnic distribution of the sample was as follows: Caucasian (N=624, 73.7%); African American (N=153, 18.1%); Asian Pacific American (N=15, 1.8%); Hispanic (N=28, 3.3%); and Native American (N=11, 1.3%). Eleven individuals (1.3%) identified themselves as others and five cases (.6%) could not be classified. Because of missing values, 21 cases were deleted from the sample and thus the data from 826 cases were analyzed.

In order to determine the reliability of the LVI, it was readministered to 173 university students. Their ages ranged from 18 to 23 years old with a mean age of 20.01 years. The sample was comprised of 113 females (65.3%) and 53 males (30.6%). The gender of seven students (4.1%) could not be classified due to missing data. The ethnic distribution of the group that was retested is as follows: Caucasian (N=133, 76.9%); African American (N=34, 19.7%); Asian Pacific American (N=4, 2.3%); and Native American (N=2, 1.2%). Eleven subjects were deleted from the analysis because of missing values in their responses. Except for the fact that the sample that was retested was younger than the larger sample (M=20.01 versus 24.69), the retested sample was quite comparable on other characteristics to the total group.

Analyses

In stage two the same data collection procedures employed in stage one were followed. In the analyses, sample means, standard deviation, and ranges were calculated for each item of the LVI. Confirmatory factor analysis (CFA) was utilized to test the factor structure of the instrument. This statistical procedure allows the researcher to define the model to be tested, rather than allowing the data to determine the model as in

exploratory factor analysis. In stage two a model was specified based on the findings of the stage one factor analysis. In the confirmatory factor model, substantively motivated constraints are employed to more clearly establish the structural characteristics of measures of hypothetical constructs, thus providing a suitable and stringent model of goodness of fit (Lennox, Welch, Wolfe, Zimmerman & Dixon, 1987; Long, 1983; Tinsley & Tinsley, 1987). Thus, CFA was used to test the a priori factor structure determined in stage one. Each item was defined with its corresponding factor and only that factor. Because of the inter-factor correlations reported in stage one, an oblique model was specified. This was accomplished by allowing the statistical procedure to estimate the covariance between factors. The model was estimated using the maximum likelihood procedure (Joreskog, 1973). A preliminary least-squares estimation of the parameters was used to obtain initial values for the maximum likelihood estimation.

The CALIS procedure of the SAS statistical programming package (SAS Institute Inc., 1990) was chosen for this analysis for its ease of programming and its provision of a number of goodness-of-fit indices. One measure is the statistic which is used to compare the correlation matrix estimated by the model with the correlation matrix of the actual data. If the difference between the two matrices is nonsignificant, an appropriate fit is indicated. However, this statistic is inflated by large sample sizes and sometimes renders a significant difference despite a possibly good fit (Long, 1983; Bollen, 1989). Hence, other indices are typically calculated. Due to the absence of previous standards of fit for values constructs, .90 served as a guide for testing the efficacy of the model and evaluating the need for further respecification.

Internal consistency was estimated by utilizing the same methods in both stages. Test-retest reliability over a two week period was determined by comparing the summed scores of the scales of subjects that completed the LVI during the first

and second testing sessions. An intraclass reliability coefficient was calculated using analysis of variance procedures to assess the test-retest reliability of the scales (Haggard, 1958; Kroll, 1962; Safrit, 1976).

Results

Confirmatory factor analysis. Several goodness of fit analyses were computed to test the efficacy of the model, including Chi Square (3109.196, $p < .0001$, $df = 900$). The values of other goodness of fit analyses were: (1) .848 for the Goodness of Fit Index, (2) .825 for GFI adjusted for degrees of freedom, (3) .807 for Bentler's Comparative Index, (4) .788 for Bentler & Bonett's Non-Normed Index, and (5) .750 for Bentler & Bonnett's Normed Index. While these indices approach .90, the overall conclusion reached was that the model derived from stage one analyses might be improved with respecification.

Model respecification. The LVI was reexamined utilizing exploratory factor analysis as a guide to understanding the relationships among the items. Additionally, each item's relationship to the model as indicated by the amount of shared variance between an item and its corresponding factor was analyzed. A low correlation indicates little shared variance between an item and its factor, and that the removal of the item could substantially improve the model (Anderson & Gerbing, 1988).

Principal axis factor analysis was conducted on the remaining 45 items, extracting 10 factors. All factors maintained the predicted structure except for Independence, which accounted for the least amount of variance in the stage one analysis. Examination of the factor loadings indicated that the five items included in the Independence factor failed to form a stable factor. None of these items had high loadings on the other factors or were greater than the items that were specified for that factor in stage one. Hence, these five items were deleted from the model.

Finally, all nine remaining factors had 3-4 items with the exception of the Order factor, which had five items. In an effort to create proportional dimensions for the revised version of the LVI, the lowest loading item was deleted. This resulted in nine factors consisting of 31 items in the respecified model with four factors containing 4 items per factor and five factors with 3 items. The respecified model is designated as LVI-R for the purpose of distinguishing between the 31 and 45 item instruments.

Principal axis factor analysis was conducted for the remaining 31 items, extracting 8-10 factors respectively. Scree tests of the eigen values, hyperplane counts, and the criterion of interpretability all indicated that nine factors yielded the best solution. Convergence was reached in 19 iterations. The percentage of total variance accounted for by the nine factor solution was 64.09%. The highest inter-factor correlation was .421, indicating the use of the oblique rotation matrices for factor interpretation. However, interpretation of the oblique factor pattern was nearly identical to the orthogonal factor pattern. The factor structure of LVI-R was deemed an appropriate model to be analyzed by CFA. Once again, because there were moderate correlations between factors, an oblique model was used.

Confirmatory factor analysis, LVI-R. The model as defined by the a priori factor structure from the respecified LVI-R reached convergence with resultant fit indices. The values of the indices for the maximum likelihood estimations ranged from .843 for Bentler and Bonett's Normed Index to .900 for the Goodness of Fit Index. The Chi Square was also significant (8503.911, $p < .0001$, $df = 398$). This was an improvement over the initial model for all goodness of fit indices.

Test-retest reliability. Intraclass correlations calculated for each factor ranged from a low of .781 for the Solitude factor to a high of .966 for the Spirituality factor, indicating an acceptable level of test-retest reliability for each of the nine factors.

Internal consistency. Cronbach's alpha and SMC's of the factor scores were calculated to examine the internal consistency of each factor of LVI-R. The values of alpha for the factors ranged from a low of .672 for the Scientific Inquiry factor to a high of .868 for the Spirituality factor. The values of the SMC's ranged from a low of .744 for the Solitude factor to a high of .892 for the Spirituality factor. As was the case in stage one, the two measures of internal consistency closely approximated each other and the high values indicate stability of factors.

Other validity data. Swift (1996) conducted a multi-trait, multi-method validity study of the 45 item LVI. In one portion of his study, he correlated five analogous scales on the LVI (Material Wealth; Altruism, Social Acceptance, Creativity, and Independence) with analogous scales on the Rokeach Values Scale. The analysis yielded correlations ranging from .187 (Social Acceptance) to .510 (Creativity). Swift also correlated these same scales scores with the scores of five scales from the Values Scale (1986). Unlike Rokeach's scales, which consist of one item, the scales on the VS are made up of five items and thus provide the potential for much more variability. The resulting correlations between analogous scales, which were composed of the four items that loaded best on the factor, ranged from .357 (Independence) to .624 (Material Rewards).

Stage Three Revision & Pilot Testing

Reading Level & Cultural Sensitivity

At the end of stage two it was concluded that, while the LVI-R represented an approximation of a scale that could be used to help people make decisions, the failure to obtain two important Eurocentric values, Independence and Achievement, represented a major shortcoming. Moreover, when the values on the LVI-R were compared to those identified in the multicultural

literature (e.g. Carter, 1991; Kluckhohn & Strodtbeck, 1961; Sue & Sue, 1990), some significant omissions were obvious. At this point several developmental efforts were undertaken. First, using word lists and reading experts, the reading level of the LVI was reduced to approximately the sixth grade level. This effort resulted in alterations in every aspect of the LVI-R, including the directions, item wording, and scale names. Lists of synonyms were used in rewording the items in an attempt to ensure that new items approximated the item they replaced. Second, the authors rewrote items on the Independence scale and reconstructed Achievement and Independence Scales based partially on the first two series of analyses. Third, the number of items per scale was increased to five, some of which were drawn from the earlier versions of the LVI based on factor analytic results (i.e., correlations with factors), and some of which were newly written. Fourth, LVI-R was submitted to a small panel of multicultural reviewers (Asian American female, African American male, Native American female) for their reactions. They suggested that Loyalty to Family or Group be added to the inventory. Accordingly, five items were developed to measure this value.

The newly revised LVI, which consisted of 12 scales, was submitted to a second panel of reviewers consisting of one Cuban American female, one Mexican American female, one Asian American female, one African American male, one Caucasian female, and two Native Americans (one male and one female) who were familiar both with values research and the values of their cultural groups. The reviewers were asked to critique the instrument in terms of its sensitivity to cultural issues (i.e. objectionable material), cultural appropriateness (i.e. words and concepts used are appropriate for all cultural groups), comprehensiveness (i.e. all major values held by all cultural groups are included), and clarity. On the basis of the second multicultural review, several changes were made in the wording of items, and three scales consisting of five items each were added to the LVI-12. These were

labeled Humility, Responsibility, and Concern for the Environment.

Pilot Testing LVI-15

Because of the number and magnitude of changes to LVI-R it was determined that the revised scale should be pilot tested prior to validation. LVI-15 was administered to 237 community college students, undergraduates attending four year colleges, graduate students, and a few retirees. The pilot sample ranged in age from 17 to 77 with a mean age of 26.763. Two individuals (.8%) had not completed high school, 14 (5.9%) had completed high school, 126 (53.25%) had completed some college but had not earned a degree, 73 (8.0%) had earned an associates degree or vocational-technical college certificate, 65 (27.4%) had earned a Bachelors degree or higher, and 2 (.8%) provided no data about their educational achievement. One hundred fifty-five (65.4%) of the people participating in the pilot were female and 82 (34.6%) were male. Forty-one (17.3%) of the participants were African American, three (1.3%) were Native American, two (.8%) were Asian Americans, four (1.7%) were Hispanics, 173 (73.0%) were Caucasian, 10 (4.2%) classified themselves as other, and four (1.7%) could not be classified because of missing values. The SPSS program used in the analysis tests sample adequacy using the Kaiser-Meyer-Olkin Measure of Sample Adequacy which yielded a coefficient of .837, deemed meritorious (Kaiser, 1974).

Results

Factor structure. Two hundred thirty-seven usable responses to LVI-15 were factor analyzed using principal axis analysis with an oblique rotation because of moderate correlations among factors. Solutions for 10 through 15 factors were extracted. The 14 factor solution, which took more than 50 iterations, offered the best solution based on the scree plot analysis of eigen values and observation. Using item factor correlational data as the basis for decisions, three items per scale were selected for inclusion in the LVI, and

the results were reanalyzed using the same procedures. Once again, the fourteen factor solution proved to be the most satisfactory solution in this analysis. The fourteen factors and the item loadings associated with them are shown in Appendix B.

The factor analysis of the pilot data supported the earlier statistical and conceptual work on the instrument, with one exception. The Order factor was replaced in the analysis of the pilot data by a more general factor which was labeled Responsibility. The factor correlation matrix can be found in Appendix B.

Internal consistency. Cronbach's alphas were also computed for each three item scale. Cronbach's alphas were computed for each factor. These ranged from .626 for the Independence scale to .897 for the Spirituality scale, which indicates factor stability is well within an acceptable range. The total variance accounted for by the 14 factor solution with three items per scale was 75.28%.

Stage Four Validation of LVI-14

In order to establish the construct validity of the LVI, it was decided that the scores of the validation sample would be compared to the scores on two established scales, the *Rokeach Values Survey* (Rokeach, 1973) and the *Vocational Preference Inventory, Form B* (Holland, 1985) using Pearson Product Moment correlations. Additionally, the adult sample completed was asked to complete the *Crown-Marlowe Social Desirability Scale* (Crowne & Marlowe, 1960). The order of administration of the instruments was counterbalanced in both the adult and the high school samples. All subjects were paid \$5.00 for their participation in the study. People in the adult sample who completed all instruments were also eligible for a prize of \$25.00. The winners of these prizes, which were made available to each of the subsamples in the adult sample, were

determined by a drawing at the conclusion of the data collection for each subgroup.

Validation Samples

Validity data were collected from two samples: 334 high school students from a large (1500+) comprehensive high school in Raleigh, NC and 342 adults from California, Minnesota, Pennsylvania, Georgia, Virginia, and North Carolina. The data for the high school sample were collected in classroom settings after informed consent was obtained from both students and their parents. The classes used in the research were selected because they were representative of the entire student body of the school at the time the research was conducted. The characteristics of both samples can be seen in Appendix C.

Construct Validity

Tests for sampling adequacy and principal axis extraction for a 14 factor solution was conducted to examine the 14 scale model of the revised LVI. Results from the study are reported separately for the adult and high school samples.

Factor structure, adults. Listwise deletion of cases resulted in 326 valid cases to be analyzed. Sample adequacy was examined using the Kaiser-Meyer-Olin Measure of Sampling Adequacy which yielded a coefficient of .7824, deemed middling (Kaiser, 1974). Principal axis extraction resulted in a 14 factor solution that reached convergence in 27 iterations and accounted for 73.2% of the variance. The highest inter-factor correlation was -.42, indicating the use of oblique rotation matrices for factor interpretation. A stable factor structure resulted that supported the predicted 14 scale model. One problematic item emerged from the Independence scale (#33, Having control over my time) which had significant cross-loadings on other factors (Privacy and Responsibility) and did not load highly on the Independence scale. Appendix D presents a list of the 42 items and the standard regression coefficients from the oblique rotated factor

pattern matrix. Appendix E presents the inter-factor correlations.

Factor structure, high school. Listwise deletion of cases resulted in 316 valid cases to be analyzed. Sample adequacy was examined using the Kaiser-Meyer-Olin Measure of Sampling Adequacy which yielded a coefficient of .82342, deemed meritorious (Kaiser, 1974). Principal axis extraction resulted in a 14 factor solution that reached convergence in 29 iterations and accounted for 72.2% of the variance. The highest inter-factor correlation was .38, indicating the use of oblique rotation matrices for factor interpretation. A stable factor structure resulted that supported the predicted 14 scale model, with one exception. The Independence scale proved to be unstable with each item cross-loading on at least one other scale. Appendix D presents a list of the 42 items and the standard regression coefficients from the oblique rotated factor pattern matrix. Appendix E presents the inter-factor correlations.

Summary of factor structure. The factor structure of the LVI has proven to be stable, a claim that cannot be made by any of the extant inventories. The LVI-9, the immediate predecessor of LVI-14, has been factor analyzed in three different dissertation studies (Crace, 1992; Flannelly, 1995; Swift, 1996) and each time the nine factor solution was shown to be the most satisfactory solution so long as the original items were used. Flannelly and Swift used some redrafted items pertaining to the Independence scale and both of their analyses yielded identical 10 factor solutions. The factor structure of LVI-14 was replicated twice (in the adult and high school analyses) and was shown to be the best solution in both cases. These studies attest to the construct validity of the LVI. Replication has also indicated the need for further work to stabilize the Independence scale. By contrast, three factor analyses of the Values Scale (Nevill & Super, 1989) yielded three different solutions. Factor analytic studies of the Rokeach Values Survey by Braithewaite and Law (1985) yielded a 14 factor solution, whereas Rokeach's (1973) own research had earlier

produced a seven factor solution. Moreover, the amount of variance accounted for in the factor analytic studies of the LVI exceeds that found in studies of other prominent instruments. Results also indicate the LVI includes scales that are relatively independent. For example, the highest interscale correlation on the LVI for adults is -.42 with only four interscale correlations exceeding .30. By contrast 31 of the VS scale intercorrelations are at or above .50.

Convergent Validity

Convergent validity was assessed by correlating LVI scale scores with items from the Rokeach Values Survey (RVS) using Pearson Product Moment correlations. A rating scale version of the RVS was used due to the difficulty of statistical analyses with the original ipsative ranking version (Thompson, Leveitove, and Miederhoff, 1982). The RVS was chosen because it has been widely researched and is arguably the most respected and broadly used values inventory available. Thirty predictions were made regarding the relationships between the LVI and RVS scales for both the high school and adult samples, respectively. Of these predictions, 27 of the correlations were significant for adults and in the expected direction. In the case of the predictions that were not supported (Belonging, Creativity, and Independence), other correlations with analogous scales on the RVS were supportive of their convergent validity. Twenty-four of the predictions for the high school sample were supported. Some of the expected differences not supported, such as the one between Freedom and Independence, may be because they are not highly crystallized values for high school students. Data for the high school and adult samples are presented separately in Appendix F.

While the correlations were significant it was hoped they would have been higher than those that resulted. However, subsequent analyses of the RVS responses indicated a strong positive response bias for both samples. Responses that are strongly skewed lowers variability and, consequently, the size of resulting correlation

coefficients. The impact of the positive response bias for the RVS can be seen in Swift's (1996) results. Correlations between Prosperity, Concern for Others, Belonging, Creativity, and Independence with five analogous scales on both the RVS and VS yielded correlations ranging from .217 to .513 ($M=.406$) for the RVS and from .386 to .664 for the VS ($M=.526$). While these results may be attributable to other factors, the most plausible explanation lies in the skewed nature of the RVS responses.

Discriminant Validity

Discriminant validity was assessed from the adult sample by correlating LVI scale scores with the Crowne-Marlowe Social Desirability Scale. It was predicted that the impact of the social desirability response set would be minimal resulting in low correlations. Appendix G presents the correlations between scores on the LVI and the Crowne-Marlowe Social Desirability Scale. Correlations ranged from -.035 to .277. While 11 correlations were statistically significant at the .05 level, the small size of the correlations suggests that the impact of the social desirability response set is minimal, accounting for a small amount of the variance in LVI scores. For example, the highest correlation of .277 accounts for only 7.6% of the variance in the Concern for Others scale.

Reliability

Internal consistency. Cronbach's alpha was used to assess the internal consistency of the LVI scales for both adult and high school samples. Coefficients for adults ranged from .55 on the Independence scale to .88 on the Spirituality scale. Coefficients for high school students ranged from .51 on the Independence scale to .81 on the Concern for the Environment scale. Ten of the coefficients for the adult sample exceeded .70 and 12 of the coefficients for the high school sample were at .70 or above, demonstrating adequate internal consistency for both samples. Appendix H presents the coefficients on all scales for both samples.

Stability. Temporal stability of LVI scales were examined with test-retest reliability coefficients from subsamples of 72 adults and 51 high school students respectively. The retest coefficients on all scales for both samples were significant at $p < .0001$ over an interval of about 18 days (adult mean interval in days=18.9, SD=6.0; high school mean interval in days=18.02; SD=.24). Retest coefficients for adults ranged from .57 on the Concern for Others scale to .90 on the Spirituality scale. Coefficients for high school students ranged from .49 on the Privacy scale to .75 on the Belonging scale. Appendix H presents the coefficients on all scales for both samples.

A pilot study of 25 university students examined the test-retest reliability of the *ranking* section of the LVI. Time frame between assessments was three months. Most students indicated this was a transitional period in their lives reflecting a stringent test of the dynamic nature of values during transition. 96% of the students ranked their top value as first, second, or third on the retest. 88% ranked their top value as first or second on the retest. 88% of two out of three highest ranked values were listed in the top three values on the retest. 84% of the top three ranked values were listed in the top five values on the retest. 76% of four out of five top ranked values were listed in the top five values on the retest.

Exploratory Analyses

Relating the LVI to Behavior

One of the most difficult forms of validity to establish in personality measurements is criterion-related validity. The most notable attempt at establishing criterion-related validity with values was by Rokeach where he examined the relationship between values scales on the RVS and such behavior as organizational, political, and religious involvement; honest behavior; interpersonal conflict; behavior in the counseling situation; academic pursuits; life style and occupational choices (Rokeach, 1973). An initial

attempt was made at examining the criterion-related validity of the LVI by developing a Behavioral Rating Scale.

When completing the LVI, individuals were asked to indicate whether the 42 beliefs contained in the items guide their behavior (See Appendix A). In order to get an estimate of whether results on the LVI do in fact correspond to observed behaviors, subjects in the adult validation subject were asked to identify a person who knows them well, and send them a Behavioral Rating Scale (BRS; Appendix I) that was designed to assess behaviors associated with the values on the LVI.

Development of BRS. It was determined that all items on the BRS should reflect observable behavior that could be manifested by people of all ages. The first step in identifying these behaviors was to ask 18 graduate students in counseling and school psychology and 10 psychologists in a university counseling center to identify the likely behavioral manifestations of the fourteen values measured by the LVI. Their suggestions were screened by the researchers and 56 statements (four per value) were selected for inclusion on the BRS. Six staff psychologist from National Computer Systems rated each of the 56 statements regarding the extent to which they believed the statement represented a behavior that would be manifested by a person holding the value in question. The scale used was as follows: 1=poor; 2=not bad; 3=okay/adequate; 4=good; 5=excellent/prototypic. The staff psychologists were also asked to identify behaviors that they believed would be manifested by individuals holding each of the values measured by the LVI and to replace those they felt were not indicative of the behavioral domain related to the value. Items rated with average ratings of 3.5 by the panel were retained, sometimes with minor editing, with two exceptions. One highly rated item was replaced because one judge noted that it was quite similar to another item. Another highly rated item was deleted because it was decided that people of all ages might not be able to engage in the activity described in the item. The result of this procedure was a pool of 37

acceptable items. The additional 19 items on BRS were rewritten items and suggestions from the expert panels, and suggestions from the authors of the LVI.

In order to get BRS ratings, each person in the adult sample was asked to (1) identify a person who knows them well, (2) address an envelope to that person, and (3) place the BRS, an informed consent form, a stamped, self-addressed envelope, and a letter explaining the purpose of the research into the envelope. The researchers mailed the envelopes that were prepared by individuals participating in the study. A total of 124 people returned the BRS.

Results. Correlations between the LVI and BRS scales are presented in Appendix I. Eight of the correlations between the BRS and analogous LVI scales were statistically significant ($p < .05$). Another correlation (Prosperity; $r = .17$; $p < .057$) approached significance. It should be noted that analyses of skewness for both the LVI and the BRS revealed positive skew in the ratings and thus restricted the variability of the response. This undoubtedly lowered the size of the correlations and precluded the correlation for Prosperity from reaching significance. However, it is noteworthy that eight of the scales on the LVI did demonstrate some form of criterion validity. It is the first values instrument to demonstrate a relationship between the constructs measured and the observations of people who knew the subjects well. It should also be noted that future efforts will need to focus on improving the methodology, perhaps by establishing the type of behaviors manifested by people holding various values measured by the LVI through interviews or by collecting observational data.

Also, some of the correlations between scales on the LVI and BRS may not have reached significance because the behaviors being rated may be subtle, and thus are hard to identify and rate (e.g., those behaviors related to humility). It may be the case that, because the sample was relatively young, they manifest different value-

related behaviors than do non-students and older adults and, thus, the behaviors placed on the BRS were inappropriate.

Career Profiling: Correlating the LVI with Holland's Types

During the validation study of the LVI, subjects in both samples were asked to complete the Vocational Preference Inventory (Holland, 1985) to get a preliminary indication of the relationship between values and other popular career profiling systems such as Holland's RIASEC themes. An attempt to predict the values Holland (1985) suggests are associated with his pure types met with limited success. A total of 13 predictions were made about the relationships between the values on the LVI and the types as measured by the VPI, form B. Six of the predictions were accurate. Three of the misses were regarding the Belonging scale on the LVI as it relates to the Realistic (- prediction), Social (+ prediction), and Conventional (+ prediction) scales. Belonging seems to be more related to seeking social recognition and friendship than it is to conformity, which was what it was presumed to measure.

Positive links between Concern for Others and Social types, Scientific Understanding and Investigative and Realistic types, and Creativity and Artistic types were found. The expected negative relationship between Independence and Conventional type was also found. However, the expected linkages between Prosperity and Enterprising type, and Achievement and Enterprising type were not realized. Future research should perhaps focus on Holland's subtypes, not the pure hypothetical types that do not exist in the real world.

Life Values Inventory (2002)

Revisions to LVI (1996)

Since the release of the LVI, we have received continual feedback from counselors and consultants who have used the LVI in individual and group modalities with diverse populations. While the feedback has been consistently positive, we have attempted to incorporate suggestions that have been offered as a way of improving the utility of the LVI for counseling or consulting purposes. Revisions to the LVI were made while trying to maintain the empirical validity of the 14 scales.

The rating scale was slightly changed to improve the disbursement of ratings. Counselors have noted the reactivity of some individuals to the words “almost never” and “almost always”. These phrases were replaced with “seldom” and “frequently.” Additional information was provided in the instructions to clarify how to appropriately respond to the values items.

Two values scales were renamed to more adequately reflect the intent of each scale. These were scales that typically required further explanation by counselors and carried unintended connotations by users. Loyalty to Family or Group was changed to Interdependence. Scientific Understanding was changed to Objective Analysis.

The earlier factor structure of Objective Analysis was reflective of a values scale that measured the reliance on logic, analysis, and objective facts to make decisions and solve problems. The use of the top three loading items has presented confusion among many respondents because they imply an interest in science rather than a value for objective analysis. This scale was modified using items that originally loaded on this factor and that more clearly reflect values.

Formatting of the sections was revised to improve parsimony and utility of the values clarification process. The rating and ranking sections were more clearly integrated. The open-ended, qualitative section was removed. While these questions were helpful for discussion, they tended to disrupt the flow of moving from the rating to ranking of values. The life role section focuses primarily on three major life roles: work, important relationships, and leisure. The student role is integrated with the Work role as most values reflected in one’s academic preparation are similar to values desired in one’s work role. A final section was added to assist individuals in applying their results to career/life role development, transition, and stress management.

See Appendix A for the revised Life Values Inventory. While every effort has been made to maintain or improve the integrity of the 14 values scales, any change to a psychological inventory may impact its psychometric properties. Further empirical research is warranted to examine the validity and reliability of the revised LVI.