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ABSTRACT

This symposium on measurement and research tools consists of three presentations. "An Examination of the Multiple Intelligences Developmental Assessment Scales (MIDAS)" (Albert Wiswell et al.) explores MIDAS's psychometric saliency. Findings indicates this instrument represents an incomplete attempt to develop a valid assessment of multiple intelligences; further work conceptually refining some subscales may lead to more robust measures of these constructs. "Evaluating Corporate Quality of Life (QOL) Programs: Utilizing the Balanced Scorecard Model in Conjunction with Quasi-Experimental Design" (Wendy J. Casper, Ann L. Landy) describes the development of a performance monitoring system for the QOL programs of a large, decentralized government agency, that was designed using the Balanced Scorecard model for strategic planning, measurement, and program management in conjunction with a synthesis of research findings. "Validating a Tool to Measure Customer Service Competencies" (Darlene Russ-Eft, Caryl Berrey, Ruth Pangilinan, Regina Atwood) reports a study that used the critical incidents that formed the basis of a previous study and the resulting competencies to develop and validate a tool to assess service competencies. All three papers include bibliographies. (YLB)

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An Examination of the Multiple Intelligences Developmental Assessment Scales (MIDAS)

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Wider acceptance and use of Multiple Intelligence theory by psychologists, educators, and trainers have been thwarted by the lack of a practical, reliable and valid method of assessment. When used as a diagnostic and combined with behavioral observations, the MIDAS instrument could be useful in facilitating career choices and tailoring learning opportunities to multiple means of understanding. The purpose of this study was to explore the MIDAS's psychometric saliency.

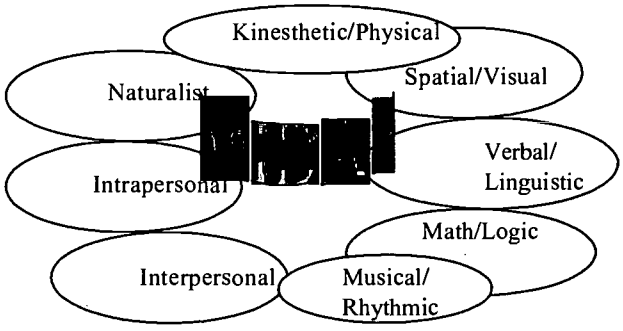
Key Words: Multiple Intelligence, Measurement, MIDAS

What relevance is intelligence to education and training? Would it be helpful to diagnose, prescreen, and or predict some measure of success in specific fields of endeavor? This paper assumes its obvious relevance and contribution. Our attention herein is upon the measurement of intelligence that has become synonymous with the construct in our western culture. Measurement (of intelligence) has been a major focus since Alfred Binet developed the first test of cognitive abilities for French school children in 1905. In spite of Binet's refusal to claim that his test actually measured intelligence, his invention became the basis for one of psychology's most enduring contributions to education and society of the 20th century (Binet & Simon, 1916). In the wake of Binet's work, the unitary definition of intelligence -- as exemplified by the intelligence quotient (I.Q.) and assessed by the Stanford-Binet, Weschler and college admission tests -- has become a commonplace.

Although prominent theorists such as J.P. Guilford (1967), L.L. Thurstone (1947) and R.J. Sternberg (1988) have offered multi-factored alternatives to the unitary I.Q. model, none have had the impact on the educational community as that of the theory of multiple intelligences (MI).

In 1983, Howard Gardner proposed that human intelligence is best defined as a "bio-social potential" that allows a person to solve problems and create products that are valued within a community. Using this definition and eight criteria Gardner has identified at least eight distinct yet complementary constructs: linguistic, logical-mathematical, musical, spatial, kinesthetic, interpersonal and intrapersonal and naturalist (1993).

Figure 1. Gardner Constructs represented by the MIDAS



The Multiple Intelligences Developmental Assessment Scales (MIDAS)

Wider acceptance and use of MI theory by psychologists, educators, and trainers has been thwarted by the lack of a practical, reliable and valid method of assessment. MI theory itself has likewise been viewed with suspicion by traditional cognitive scientists accustomed to assuming that intelligence can be quantified via a single I.Q. score. Critics of MI theory dismiss its legitimacy by claiming that it is more of a "literary" rather than "scientific" theory because there is no valid method of measurement that produces quantifiable data. Gardner's contextual and culturally embedded definition of intelligence challenges the assumption that intellectual prowess can be reduced to a single score that can be measured via paper-and-pencil and decontextualized tests. In the MI perspective, the vast majority of "real world" problem-solving occurs within value-laden, stimulus-rich situations requiring something more than answering short questions with short answers as quickly as possible. This contextually-based conception of intellectual ability requires a contextual approach to assessment in order to describe the person's intellectual and creative life (Shearer, 1994).

The Multiple Intelligences Developmental Assessment Scales (MIDAS) were originally created in 1986 to be administered to adults in conjunction with a neuropsychological evaluation. It was first developed as an interview to be conducted with a family member to obtain an understanding of the intellectual profile of the patient (Shearer, 1994). Uses since its conversion to a paper pencil questionnaire are now targeted at adult populations to quickly self-assess one's MI profile for counseling and educational uses. Because of the potential for the instrument to gain popularity and utility with educators, trainers, and HR practitioners, an objective assessment of the MIDAS's reliability and internal psychometric constructs (as initial evidence what it purports to measure is as important as its theoretical framework and potential applications.

According to Shearer (1994), its conversion to a 119 item self-completed questionnaire was designed to retain features of a structured interview probing for both qualitative information and quantitative data. On the questionnaire itself, response choices are marked by letter rather than by number to encourage respondents to respond to the descriptive choice rather than to a number. Likewise, the descriptors for each response option are uniquely written to fit the specific content for each question.

The questions inquire about observable activities that represent core features of each of the multiple intelligences as described by Howard Gardner. The questions are written in one of three basic forms. A majority of questions ask the informant to provide a realistic evaluation of his/her skill level in a specified activity. The second type of questions inquire about the frequency or duration of time the respondent spends engaged in an activity representative of the designated construct. The fewest number of questions ask for an assessment of the respondent's enthusiasm for the target activity. The MIDAS Profile consists of percentage scores for the eight areas of intelligence along with 29 sub-scale scores describing specific skills. Scale scores are calculated and used to profile respondents.

The wording of questions; scale composition and scoring matrices went through a lengthy series revisions and testing from 1987 through 1996 (Shearer, 1994). An initial series of small scale studies reported acceptable psychometric properties including factor structure, item consistency, test-retest reliability, inter-rater agreement; subscale factor analysis and appropriate discrimination with various criterion groups and measures (Shearer, 1994; Buros, 1999).

Purpose

The MIDAS instrument was intended to help in providing a means to indicate relative interest in and one's self - evaluation of abilities in regard to Gardner's eight facets of intelligences. Though arguably not an achievement or aptitude scale, when used as a diagnostic and combined with behavioral observations, the MIDAS could be useful in facilitating career choices and tailoring learning opportunities to multiple means of understanding. The purpose of this correlational study is to help explore the MIDAS's psychometric saliency by examining the reliability (internal consistency) and factor constructs of the instrument and its scales. Moreover, this study was to further examine the MIDAS scales using exploratory factor analytic techniques with a significantly larger sample than was available during the instrument's development.

Method

Sample and Data Analyses. Sample size requirements are driven by recommended factor-analytic and structural equation modeling (SEM) conventions with regard to subject (orcase) to variable (or parameter) ratios and minimum size of samples. It is generally advocated that for factor-analytic work an acceptable or "rule of thumb" ratio should

be at least five cases per variable, with a minimum sample size to be 200 (Kline, 1993; Tabachnick & Fidell, 1989). Kline (1998) also recommends sample sizes of at least 200 for SEM analyses. To analyze the MIDAS's 119 items, a total sample of 1419 adults were be used. A total of 1419 protocols were coded analyzed in StatView 5.0 (SAS) for internal reliability, principle component, and factor analyses.

Psychometrics. To adequately examine the MIDAS, the analyses performed in this study followed very deliberate conventions (Nunnally & Bernstein, 1994; Tabachnick & Fidell, 1989): demographic frequency distribution analysis, an internal reliability analysis (Cronbach's alpha), an examination of the correlation matrix for factorability, the number of factors to retain were user specified based on MI theory, after which an iterative or common factor analysis was performed for the final extraction, factor stability comparisons, potential second order implications, and possible theoretical interpretations.

Results

Reliability. In this study, all eight scales yielded reliability coefficients of .85 to .90 (Cronbach Alpha) as depicted below in Table 1:

Table 1. Reliability (MIDAS)

Scales	Alpha Coefficients
Musical	.87
Physical	.85
Math/logic	.85
Spatial	.87
Linguistic	.86
Interpersonal	.86
Intrapersonal	.90
Naturalist	.88

Exploratory Factor Analysis. Based on the MIDAS's theoretical framework (some expected commonality among constructs), eight factors were specified and a simple oblique solution was sought using an iterative or common factor extraction. With a varimax rotation, the following eigenvalues were produced: 15.2, 7.6, 5.1, 4.5, 3.8, 2.9, 2.6, and 1.7 respectively accounting for .36 of the variance. Factor loadings are depicted below in Table 2.

Table 2. EFA, Eight Factors, Varimax Rotation, Oblique Solution

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
Musical	0.01	0.15	0.09	**0.58**	-0.17	-0.08	-0.09	-0.02
Musical	0.10	0.05	0.04	**0.49**	-0.11	-0.06	-0.07	0.01
Musical	0.03	0.00	-0.01	**0.53**	-0.08	-0.04	-0.09	0.13
Musical	-0.03	0.02	0.05	**0.43**	-0.03	-0.06	-0.09	0.14
Musical	0.09	-0.04	-0.04	**0.63**	-0.07	-0.06	-0.05	0.07
Musical	0.01	0.03	-0.05	**0.61**	0.05	0.01	0.09	-0.19
Musical	-0.02	-0.13	0.01	**0.55**	0.05	0.10	0.03	0.04
Musical	-0.01	-0.05	0.00	**0.64**	0.13	0.07	0.02	0.03
Musical	0.01	-0.04	-0.04	**0.68**	0.10	0.08	0.01	0.00
Musical	0.00	-0.08	-0.06	**0.65**	0.05	0.10	0.03	-0.08
Musical	0.04	0.06	-0.06	**0.51**	0.03	-0.08	0.01	0.10
Musical	0.03	0.01	0.07	**0.53**	0.02	0.05	0.00	-0.11
Musical	-0.03	-0.05	0.00	**0.56**	0.06	0.08	0.03	0.00
Musical	0.01	0.06	-0.05	**0.53**	0.11	0.01	0.12	-0.18
Physical	-0.05	0.01	-0.01	-0.08	**0.78**	-0.11	-0.08	0.07
Physical	0.01	-0.04	0.04	-0.04	**0.80**	0.01	-0.08	0.05
Physical	-0.06	0.15	-0.06	0.29	-0.08	0.11	0.01	-0.02

Physical	-0.02	0.05	0.02	0.04	**0.66**	-0.02	0.01	0.04
Physical	-0.03	0.17	0.04	0.09	**0.34**	0.00	0.04	-0.03
Physical	0.06	-0.01	-0.02	-0.02	**0.81**	0.00	-0.15	0.03
Physical	0.05	0.19	0.15	-0.03	**0.40**	-0.09	0.05	-0.12
Physical	0.11	0.11	0.00	0.10	**0.31**	-0.17	0.19	0.13
Physical	0.11	0.16	0.00	0.10	-0.14	-0.19	**0.48**	-0.04
Physical	0.05	-0.04	0.07	-0.02	0.08	-0.08	**0.62**	0.03
Physical	-0.24	0.08	-0.03	0.08	0.22	0.20	**0.31**	0.05
Physical	-0.14	0.21	-0.08	0.20	0.17	-0.02	0.15	0.01
Physical	-0.05	0.18	-0.01	0.06	0.08	-0.05	0.14	-0.01
math/logic	**0.74**	0.01	-0.08	0.10	-0.12	-0.08	-0.12	-0.06
math/logic	**0.80**	-0.03	-0.03	0.08	-0.06	-0.10	-0.09	-0.07
math/logic	**0.67**	-0.01	-0.04	0.08	-0.07	-0.05	-0.14	-0.07
math/logic	**0.45**	-0.22	**0.30**	-0.01	0.05	0.09	0.08	-0.02
math/logic	**0.33**	0.02	0.09	0.05	0.11	-0.05	0.10	0.10
math/logic	**0.48**	-0.06	0.07	0.00	0.01	0.05	0.12	0.09
math/logic	0.21	0.06	0.01	0.15	-0.13	0.15	0.04	-0.05
math/logic	**0.47**	0.05	-0.05	-0.05	-0.05	-0.07	0.05	0.02
math/logic	**0.39**	0.07	-0.13	0.09	-0.04	0.03	0.06	0.11
math/logic	**0.73**	-0.05	-0.05	0.04	0.04	0.06	-0.08	0.08
math/logic	**0.44**	-0.06	0.10	0.02	0.11	0.07	0.22	0.05
math/logic	**0.45**	0.12	0.05	-0.10	0.00	-0.02	0.18	0.01
math/logic	0.19	-0.09	**0.51**	0.01	0.12	0.06	0.14	-0.08
math/logic	0.09	-0.06	0.18	0.00	0.07	0.17	0.26	-0.10
math/logic	**0.75**	0.03	0.00	-0.04	-0.04	-0.04	0.04	-0.01
math/logic	**0.73**	-0.07	-0.05	-0.06	0.12	0.04	-0.06	0.06
math/logic	**0.31**	0.16	-0.02	-0.11	-0.02	-0.04	**0.33**	0.12
spatial	0.13	0.09	0.10	0.08	-0.09	-0.15	**0.31**	0.03
spatial	0.04	-0.01	-0.01	0.04	0.04	-0.12	**0.62**	0.05
spatial	-0.02	0.07	-0.01	0.01	-0.12	-0.04	**0.77**	-0.02
spatial	0.16	0.02	0.02	0.02	0.21	0.04	0.15	**0.34**
spatial	0.21	0.06	0.06	0.08	0.04	0.02	0.07	**0.63**
spatial	**0.38**	-0.05	0.04	0.06	0.03	0.09	0.05	**0.52**
spatial	0.23	-0.13	0.09	-0.01	0.12	-0.06	**0.43**	**0.32**
spatial	**0.32**	-0.07	-0.01	0.05	0.02	-0.10	**0.39**	0.25
spatial	0.16	-0.09	0.05	0.00	-0.05	-0.03	**0.58**	0.12
spatial	-0.11	-0.06	0.07	0.08	0.03	0.11	**0.59**	-0.09
spatial	-0.09	0.11	0.13	-0.06	-0.05	0.04	**0.57**	-0.02
spatial	0.20	0.00	0.08	0.01	0.12	0.07	0.12	**0.59**
spatial	0.12	-0.08	0.09	-0.02	**0.40**	0.06	0.15	0.26
spatial	0.19	-0.02	0.01	0.00	0.02	0.10	**0.42**	0.01
spatial	-0.02	0.02	0.00	0.01	-0.06	0.12	**0.71**	-0.04
linguistic	-0.15	0.09	-0.02	0.10	-0.12	**0.59**	0.01	-0.09
linguistic	-0.12	-0.05	0.01	0.24	-0.05	**0.47**	0.06	-0.04
linguistic	-0.10	-0.02	0.00	0.08	-0.09	**0.66**	0.06	-0.03
linguistic	-0.06	-0.10	-0.02	0.29	-0.07	**0.51**	0.06	-0.05
linguistic	0.03	0.05	-0.03	-0.02	0.19	**0.63**	-0.09	0.14
linguistic	0.04	0.16	-0.05	-0.09	0.12	**0.47**	0.04	0.15
linguistic	-0.04	0.19	-0.02	-0.07	0.09	**0.52**	0.05	0.13
linguistic	0.05	0.07	0.03	-0.02	0.19	**0.51**	-0.10	0.05
linguistic	0.05	0.24	-0.03	-0.04	0.20	**0.39**	-0.03	0.09
linguistic	-0.05	0.13	-0.02	-0.02	0.08	**0.60**	-0.19	-0.04
linguistic	0.04	0.18	-0.01	-0.07	0.10	**0.53**	-0.07	0.03
linguistic	0.00	-0.05	0.03	0.09	-0.17	**0.57**	0.00	-0.07
linguistic	0.01	0.15	-0.06	0.00	0.06	**0.56**	-0.03	0.12
linguistic	-0.24	-0.04	-0.05	0.09	0.11	**0.44**	0.24	0.05

linguistic	0.08	0.00	0.01	0.00	-0.13	**0.65**	-0.04	-0.07
linguistic	0.01	0.05	0.00	0.02	-0.16	**0.60**	-0.02	0.00
linguistic	0.04	0.04	0.03	0.04	**-0.30**	**0.48**	-0.03	-0.20
linguistic	0.04	0.23	0.02	-0.01	-0.23	0.12	-0.03	-0.18
linguistic	0.11	-0.14	0.11	0.03	-0.13	**0.66**	-0.07	-0.02
linguistic	0.03	0.06	-0.02	-0.01	-0.03	**0.69**	-0.06	0.05
interpersonal	-0.02	**0.57**	-0.06	0.04	0.01	-0.06	-0.02	0.04
interpersonal	-0.07	**0.63**	-0.01	-0.01	-0.02	0.07	-0.03	0.00
interpersonal	0.12	**0.38**	-0.11	0.01	0.13	**0.34**	-0.03	0.04
interpersonal	-0.11	**0.34**	0.02	-0.02	0.07	0.00	-0.09	-0.01
interpersonal	-0.03	**0.65**	0.00	0.05	-0.10	-0.03	0.03	-0.07
interpersonal	-0.03	**0.59**	0.01	0.05	-0.13	-0.05	0.16	-0.02
interpersonal	-0.09	**0.57**	-0.03	-0.02	-0.09	0.06	0.12	-0.02
interpersonal	-0.03	**0.41**	0.01	-0.08	0.05	0.17	0.08	0.04
interpersonal	-0.13	**0.59**	-0.04	0.01	-0.04	0.13	0.08	0.00
interpersonal	-0.02	**0.43**	0.02	0.08	0.02	0.00	-0.07	0.02
interpersonal	0.04	**0.52**	-0.02	-0.01	0.05	0.09	-0.06	0.09
interpersonal	0.00	**0.42**	0.06	0.07	-0.08	-0.09	0.04	-0.03
interpersonal	-0.11	**0.53**	-0.10	0.10	0.00	-0.06	-0.06	0.02
interpersonal	0.04	**0.54**	0.04	0.01	0.09	-0.13	-0.08	-0.04
interpersonal	0.12	0.22	0.03	-0.07	0.09	0.23	-0.13	-0.09
interpersonal	0.01	**0.34**	-0.02	-0.02	-0.04	0.04	0.00	0.06
interpersonal	-0.07	**0.44**	-0.07	0.03	-0.06	-0.15	-0.13	0.00
interpersonal	-0.06	**0.38**	0.00	-0.02	0.06	0.19	0.09	0.06
IntrApersonal	0.14	**0.37**	0.03	-0.09	0.03	0.13	0.00	-0.12
IntrApersonal	0.09	**0.42**	0.05	-0.11	-0.01	0.06	0.08	-0.07
IntrApersonal	0.19	**0.38**	0.01	-0.08	-0.01	0.08	0.07	-0.24
IntrApersonal	0.23	**0.37**	0.05	-0.05	0.02	0.13	0.02	-0.08
IntrApersonal	0.15	**0.49**	0.05	-0.04	0.03	0.02	-0.10	-0.04
IntrApersonal	0.22	**0.42**	0.03	0.00	0.05	0.03	0.11	-0.15
IntrApersonal	0.10	0.19	0.10	0.03	-0.13	-0.06	-0.04	0.01
IntrApersonal	-0.06	0.22	0.02	0.05	-0.08	0.04	0.16	-0.25
IntrApersonal	-0.04	0.24	0.05	0.00	0.02	0.11	0.10	0.03
Naturalist	-0.11	0.12	**0.64**	0.04	0.00	-0.04	-0.15	0.11
Naturalist	-0.10	0.19	**0.67**	0.00	-0.02	-0.09	-0.15	0.07
Naturalist	0.01	-0.03	**0.78**	-0.03	0.10	-0.02	-0.04	0.08
Naturalist	0.01	-0.01	**0.65**	-0.01	0.03	-0.08	-0.02	0.05
Naturalist	-0.03	0.01	**0.75**	0.03	0.00	0.01	-0.10	0.13
Naturalist	-0.06	0.02	**0.81**	0.01	0.00	0.02	-0.09	0.12
Naturalist	0.05	-0.09	**0.74**	0.00	-0.01	0.03	0.09	-0.01
Naturalist	-0.01	0.02	**0.56**	-0.05	-0.06	-0.04	0.17	-0.03
Naturalist	0.02	-0.05	**0.68**	-0.04	-0.09	0.04	0.11	-0.03
Naturalist	0.24	-0.19	**0.48**	-0.02	0.10	0.09	0.11	-0.01
Naturalist	-0.01	0.07	**0.63**	0.01	0.03	-0.04	0.10	-0.14
Naturalist	-0.06	0.02	**0.50**	0.08	-0.02	0.05	0.25	-0.16
Naturalist	-0.12	0.08	**0.64**	0.01	0.03	0.04	0.09	-0.23

Note: This analysis yielded a total matrix sampling adequacy ratio of .946 and an average variable complexity ratio of 1.77.

The item loadings for factors representing Musical, Linguistic, Interpersonal, and Naturalistic intelligences were fairly robust. Loadings for items representing Physical, Math/logic, Spatial, and Intrapersonal scales were not clearly associated with any single factors. The Intrapersonal scale loaded on the same factor as the Interpersonal

scale, indicating that the two constructs are not adequately distinguished from each other. The Spatial scale items loaded on two separate factors suggesting that the items may be measuring two different constructs. Additionally, some items double loaded on more than one factor and a few items did not load strongly with any specified factor.

2nd Order EFA. Due to this relative promiscuity of factor loadings on the variables, a 2nd order EFA to explore the possibility of higher order constructs was conducted. Using a root curve extraction, four factors were produced (Obique rotation) with eigenvalues of 1.3, .98, .72, and .54 respectively accounting for .44 of the variance.

Table 3. 2nd Order EFA, Oblique Solution, 4 Factors

	Factor 1	Factor 2	Factor 3	Factor 4
Obl 1	-6.76E-05	**0.955**	-0.033	0.019
Obl 2	-0.109	-0.036	**-0.443**	-0.054
Obl 3	-0.26	-0.113	-0.059	-0.069
Obl 4	5.37E-05	-0.023	-0.016	**0.731**
Obl 5	-0.075	-0.13	0.154	0.046
Obl 6	.001	-0.005	**0.743**	-0.181
Obl 7	**.932**	-0.148	-0.126	-0.183
Obl 8	0.026	-0.057	0.076	0.011

Conclusions

Reliability coefficients of all scales were .85 - .90, greater than .70 are considered adequate (Kline, 1993). This was consistent with the authors previously reported results on other smaller samples. The internal scale structure as represented by the eight factor solution yielded by the exploratory factor analysis generally supported the theoretical framework and the intent of the instrument's scales (Kline, 1993; Thurstone 1947) for five of the scales *(Musical, Math/Logic, Linguistic, Interpersonal, and Naturalist)*. The other scales were not clearly defined. Promiscuity among the variables items was evident with multiple loadings on some scales *(Spatial and Physical)*. This begged for a follow-on second order in an attempt to make sense of possible higher order constructs and the MIDAS's theoretical interrelationships. The 2nd order on this sample did not assist in an additional theoretically relevant structure to ponder.

This instrument represents an incomplete attempt to develop a valid assessment of "multiple intelligences." Further work refining conceptually some of the subscales may lead to more robust measures of these constructs. We recommend that additional EFA's and separate confirmatory models (CFAs) be conducted to further test the instrument's psychometric properties and theoretical framework after modifications are made. Additionally, construct validity studies are also needed comparing the scales to other external constructs or instruments. Finally, practitioners and users of the MIDAS should be aware that this instrument, like many others used in the human resource development arena is based on self report data. The MIDAS could be useful as an initial diagnostic tool, but is not by itself a measure of aptitude or intelligences without observation of behaviors. Arguably, there should be some correspondence between honest self -assessment and actual measure of aptitude for these dimensions. When used appropriately, for example in a career exploration, career development, or group development context, a valid instrument assessing relative strengths in multiple intelligences could have great utility.

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Evaluating Corporate Quality of Life Programs: Utilizing the Balanced Scorecard Model in Conjunction with Quasi-Experimental Design

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To help a large, decentralized government agency comply with the Government Performance and Results Act, a performance monitoring system was developed to assess the effectiveness of quality of life programs—Child and Youth Services, Fitness and Wellness programs, Food Service, and Family Support Programs. This paper discusses the applicability of the Balanced Scorecard model and preliminary results of a quasi-experimental design for measuring the effects of the programs on s related to corporate performance outcomes.

Keywords: Quality of life programs, Balanced Scorecard, Performance Measurement

Research—primarily with private sector organizations—indicates that work and quality of life (QOL) have reciprocal relationships (Crosby, 1991). Private sector "work-life" programs are designed to help employees achieve balance between their work and their lives outside work (Friedman & Galinsky, 1992). Government organizations have the same work-family balance issues and have implemented similar programs. Given changes in the nature of work (i.e. employment relationships, workforce demographics), QOL issues are highly salient today and quality of life has become an increasingly important research topic. Moreover, since the implementation of the Government Performance and Results Act, in 1993, government employers are now compelled to assess the effectiveness of their operations, including their QOL programs. This paper describes the development of a performance monitoring system for the QOL programs of a large, decentralized government agency. The system was designed using the Balanced Scorecard (BSC) model for strategic planning, measurement and program management in conjunction with a synthesis of research findings. It will provide ongoing measurement of administrative efficiency and impact on corporate performance outcomes such as recruitment, retention, absenteeism and customer satisfaction.

Research Questions

This paper examines three questions:

- Can the Balanced Scorecard approach be used to create a workable system for measuring the performance of QOL programs?
- Can such a system deliver evidence of the contribution of QOL programs to corporate outcomes?
- If so, which corporate outcomes (satisfaction, retention, recruitment, absenteeism, productivity) are influenced by which QOL programs (childcare, food service, fitness and wellness, family programs)?

Background

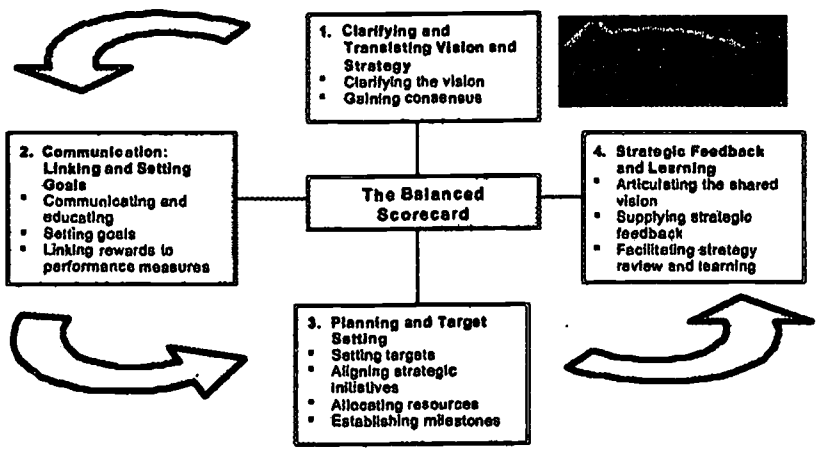
The Balanced Scorecard (BSC)—a model for strategic planning, measurement, and program management—was adopted by the government agency for all of its corporate support programs and offered a promising approach for conceptualizing, defining, and implementing the QOL performance monitoring system. Developed by Robert Kaplan and David Norton (1996), the model defines a procedure for establishing performance goals and using multiple measures to make management decisions. As a four-phase management tool (see Figure 1), the BSC allows managers to ensure that business decisions are not based solely on financial data. It also allows some measures to influence decisions more than other measures by weighting the data. While the model should not be construed as a theory of performance measurement, a measurement system defined from this framework is an

implicit logic model for predicting the impact of the QOL programs as interventions. The BSC approach involves program staff in developing a performance measurement system that tailors the measurement process closely to program activities. Moreover, based on the notion that multiple measures provide more explanatory power, the model incorporates customer satisfaction, program management, and cost effectiveness data as well as corporate outcome measurement, all of which were identified by agency staff as critical performance domains.

Methodology

The diagram in Figure 1 illustrates the way the BSC functions as a strategic framework. It shows a cycle of four activities for which the scorecard is the central or anchoring element. The development of the QOL business plan and performance monitoring system was consistent with the BSC development model (see Figure 1). In the first

Figure 1.
The Balanced Scorecard as a Strategic Framework



phase the QOL vision was clarified and consensus was gained about design issues. Meetings were held with program managers over a twelve-month period to (1) review background research and data, (2) define a strategy for developing the business plan, (3) develop the mission and vision statements, and (4) define goals and objectives. These statements formed the foundation of the business plan and performance monitoring system. An effort was made to define a few discreet goals and objectives for which achievement could be measured and that would lead to program improvement. Three major goals were defined, and three objectives were defined for each goal. The goals and objectives comprise the framework for performance monitoring and program development.

Phase 1: Clarifying and Translating the Vision and Strategy

The first phase was devoted to clarifying the QOL vision and gaining consensus among program managers about system design issues. Considerable effort was invested in preliminary research to acquire the information necessary to help managers define their expectations about program effects and the types of measures needed to demonstrate results. Comprehensive coverage of background issues involved: (1) reviewing the literature QOL programs in comparable organizations to determine where corporate outcomes had been affected by QOL programs and which QOL programs could affect corporate outcomes; (2) conducting a survey of supervisors to determine their beliefs about QOL program effects on corporate outcomes and; (3) conducting focus groups at several locations to assess perceptions about program strengths and weaknesses which augmented the empirical findings.

The findings—described below—helped managers identify feasible and potentially sensitive measurement procedures.

Child and Youth Services. This organization offered a variety of child and youth programs including full day on-site childcare, before and after school childcare, and childcare vouchers. Studies that examined the impact of on-site childcare on attitudinal outcomes reported mixed results. One literature review found little evidence that on-site childcare enhanced job satisfaction (Miller, 1984) while other research found an increase in organizational commitment and job satisfaction with the presence of on-site childcare (Kossek & Nichol, 1992; Youngblood & Chambers-Cook, 1984). In addition, while one study found access to on-site childcare resulted in the perception of greater work-family balance (O'Brien, Maher, Buffardi, Smith, & Erdwins, 1997), other research found this benefit was unrelated to work-family conflict (Goff, et al, 1990). Research examining the impact of on-site childcare on behavioral outcomes (i.e. absenteeism) provided less support for its efficacy. Though one study (Youngblood & Chambers-Cook, 1984) found a small reduction in absenteeism from 8% to 3% with implementation of on-site childcare, this change was not statistically significant. Kossek and Nichol (1992) found that supervisors did not rate users of on-site childcare differently than non-users with respect to performance or perceived absenteeism. Finally, Goff, et al (1990) found that presence of on-site childcare did not reduce absenteeism. Likewise, focus group members felt that unless sick childcare was offered (it was not), on-site childcare was unlikely to influence absenteeism.

Fitness and Wellness Programs. The agency offered on-site fitness centers as well as a variety of wellness education seminars on topics such as smoking cessation, nutrition, and stress management. The literature included studies of programs such as on-site fitness centers, nutrition education programs, health promotion programs, fitness and health risk evaluations, and supervised aerobic classes. Overall, empirical research on fitness and wellness programs provided some support for the impacts of such programs on important outcomes. One study (Leutzinger & Blanke) explored the effects of fitness centers on perceived productivity and fitness perceptions, and found that fitness center members were more likely than non-members to report positive impressions of the center and beliefs that use was linked with worker productivity. Another study (Sanderson, 1986) found that participation in an employee fitness program was related to positive health outcomes, increased job satisfaction, and decreased tardiness. Likewise, Gallant (1986) found that participation in an employee health promotion program was associated with fewer health risk factors, increased job satisfaction, and decreased absenteeism. Bertera (1993) found that at-risk employees who participated in a health promotion program used less sick leave and had more favorable results on a variety of health indicators such as cholesterol level, systolic blood pressure, amount of alcohol consumed, and use of seat belts. Finally, a study of the effects of stress management training (Leakey, Littlewood, Reynolds, & Brunce, 1994) found that participation was related to an enduring increase in psychological well-being.

Food Service Programs. While the anecdotal literature on QOL programs offers examples of employers who offer on-site cafeterias and take-out meals to their employees, no published empirical research evaluating these programs has been conducted. However, since this organization offered food services as a core QOL program, they were interested in exploring its impact on corporate outcomes. In addition, focus group results revealed that QOL managers perceived on-site food service was linked to increased satisfaction, shorter lunch breaks, and increased worker productivity.

Family Support Programs. The family support programs in this organization included both relocation assistance for relocating employees and their families, and a Family Advocacy Program (FAP) that provides services aimed at prevention and treatment of family problems through programs such as anger management and effective parenting. The extant empirical literature had not explored the effects of these types programs on corporate outcomes. However, as core programs for this agency, they were included in the evaluation plan. Furthermore, program managers who participated in focus groups expressed their beliefs that relocation assistance services were associated with decreased stress, lower absenteeism, and enhanced financial well-being, and that FAP use was related to increased satisfaction.

Phase 2: Communication: Linking and Setting Goals

The second activity involves communicating information about the strategic objectives, performance weighting, and the BSC to all business units, obtaining commitment from the staff, and helping each unit set long-term ("stretch") goals. Long-term (three- to five-year) goals are used to plan, set targets, define milestones, and

align strategic initiatives. In this phase, specifications for goals and objectives were presented to field staff for review. The presentation also was an opportunity to describe the advantages of having a homogeneous framework for assessing performance and the projected use of the data to support budget requests. Participants provided valuable information about design shortcomings, implementation obstacles, and data collection issues, all of which were incorporated in revisions to the design.

Phase 3: Planning and Target Setting

The third activity required that field staff for each QOL program area define short-term (one-year) goals, measures, minimum acceptable performance levels, and a weighting system (point allocation for each measure) appropriate for their operation. While overall goals and objectives were developed to apply across all four program areas, performance standards and indicators had to be program-specific. Using the goals and objectives as a framework, field staff members reviewed draft lists of standards, indicators, and measures, and revised material based on the utility of the information and feasibility of collecting the data. Thus, targets were established, staff gained an understanding about how program-specific strategic initiatives could align with goals and objectives (e.g., for marketing efforts), resources were identified, and milestones were established. Here, the procedure departed from the BSC model and the illustration in Figure 1. Weights have not yet been assigned for core program contribution to overall QOL performance or for each type of data to core program performance. Weights can be assigned at the end of the business cycle when the first round of data collection is complete and results are reviewed. This staff review was important to implementation. Program staff members now have a common frame of reference for measuring performance, but they define standards and measures that reflect the specific function of their program. They also play a key role in defining the standards by which the program will be judged and possess clear understanding of the data collection procedures.

Phase 4: Strategic Feedback and Learning

The fourth activity involves the use of scorecard data to assess progress and make business decisions. As the diagram in Figure 1 suggests, this process feeds directly back into the clarification and translation activity and sets system modifications in motion for the next cycle. The "scorecard" includes "scores" on multiple measures of performance in several categories, such as financial data, customer feedback, internal management indicators, and measures of employee skills and skill development needs. "Balance" is achieved by applying weights to performance data that reflect judgments about importance. For example, financial data may be weighted more heavily than data on addressing employee development needs. In the BSC model, balance also should be achieved between external measures (e.g., for customers and stakeholders) and internal measures or "performance drivers" (e.g., measures of business processes), as well as between quantitative data (e.g., outcome measures such as net profit or average response time) and qualitative data (subjective judgements).

Figure 2 illustrates how the organization can use the BSC approach. The table includes performance data, the performance targets to which the data are compared, and the use of weights to generate scores. Scores are tabulated for four categories of outcomes: corporate outcomes, program management, cost performance, and customer satisfaction. Of the performance categories, customer satisfaction was judged by the childcare staff to be most important. Scores for customer satisfaction receive a weight of 30 of 100 points. Of the four customer satisfaction measures, parent ratings of curriculum are considered most important. The on-site childcare business unit can earn a maximum of 10 of 30 points if performance targets are reached.

Quasi-Experimental Research Design

The quasi-experimental design was integrated into the BSC approach through the examination of corporate benefit. In designing research to explore the effects of QOL programs, the dilemma was to generate the most rigorous design possible within this applied setting. While the research design providing the greatest degree of rigor is the randomized experimental design (Cook & Campbell, 1979), this design requires (1) to have both an experimental (program participation) and a control (no participation) group, and (2) random assignment to conditions. Given the pragmatic constraints of the organization, random assignment was not possible. Thus, the system incorporates a quasi-experimental design for data analysis that includes treatment and control groups, but without random assignment. This quasi-experiment will be used to examine the impact of QOL programs on outcomes. For each program area, users and non-users will be compared on outcomes. In addition, the non-user comparison group will be chosen so that relevant demographic characteristics are similar to those in the user group.

For instance, when comparing users and non-users of on-site childcare, non-users will be chosen who are custodial parents of children of a similar age, but who use off-site childcare. Thus, when satisfaction levels and retention rates for the two groups are compared, findings will not be confounded by individual differences like need for childcare or age of children. Likewise, when satisfaction data from users and non-users of fitness center are compared, non-users will be matched to users on demographic characteristics, such as age, gender, and job type.

Specific Hypotheses

The literature review findings and focus group results were utilized to generate specific hypotheses regarding the impact of each of the four core programs on corporate outcomes. Performance standards are a fundamental component of a BSC. Defining performance standards is similar to stating predictions about what will be achieved as a result of implementing programs. With respect to QOL programs, predictions pertain to four categories of outcomes: customer satisfaction, management effectiveness, corporate benefit, and return on investment. Performance standards and measures were defined for each program area. Performance data will indicate whether the standards are met. The hypotheses are delineated in the section that follows.

Child and Youth Programs. Based on the review of the childcare literature (Kossek & Nichol, 1992; Youngblood and Chambers-Cook, 1984), we expected that users of on-site childcare services would report more satisfaction with the organization than non-users who used off-site childcare. While empirical research did not examine effects of childcare on turnover, focus groups revealed perceptions that such services facilitated retention. In addition, it is reasonable that employees who have their children happily situated in on-site childcare would be more reluctant to change jobs. Thus, the following hypotheses were made regarding on-site childcare:

Hypothesis 1. Users of on-site childcare programs will exhibit greater satisfaction with the organization than employees who use off-site services.

Hypothesis 2. Users of on-site childcare programs will exhibit lower turnover than employees who use off-site services.

Fitness and Wellness Programs. Several studies in the literature indicated fitness and wellness program use was linked to increased job satisfaction (Sanderson, 1986; Gallant, 1986) and reduced absenteeism (Gallant, 1986). Thus, the following hypotheses were made regarding the effects of fitness and wellness programs:

Hypothesis 3. Users of fitness and wellness programs will be more satisfied with their jobs than non-users.

Hypothesis 4. Users of fitness and wellness programs will exhibit lower turnover than non-users.

Food Service Programs. While no published research explored the effects of food service programs on corporate outcomes, results of our focus groups revealed that program managers expected a link between food service use and organizational satisfaction. Thus, the following hypothesis was generated:

Hypothesis 5. Food service use and satisfaction will be positively correlated such that more frequent use of food services will be associated with greater satisfaction with the organization.

Family Support Programs. While published research did not explore the effects of relocation services on outcomes, focus group participants felt individuals who used relocation assistance would exhibit less stress and spend fewer hours handling moving-related activities than those who did not. In addition, while published literature did not explore effects of FAP, focus group participants believed participation was linked to greater satisfaction. Thus, the following hypotheses were generated with respect to family support programs:

Hypothesis 6 Employees who use the relocation assistance program will report lower stress than employees who relocate but do not use the program.

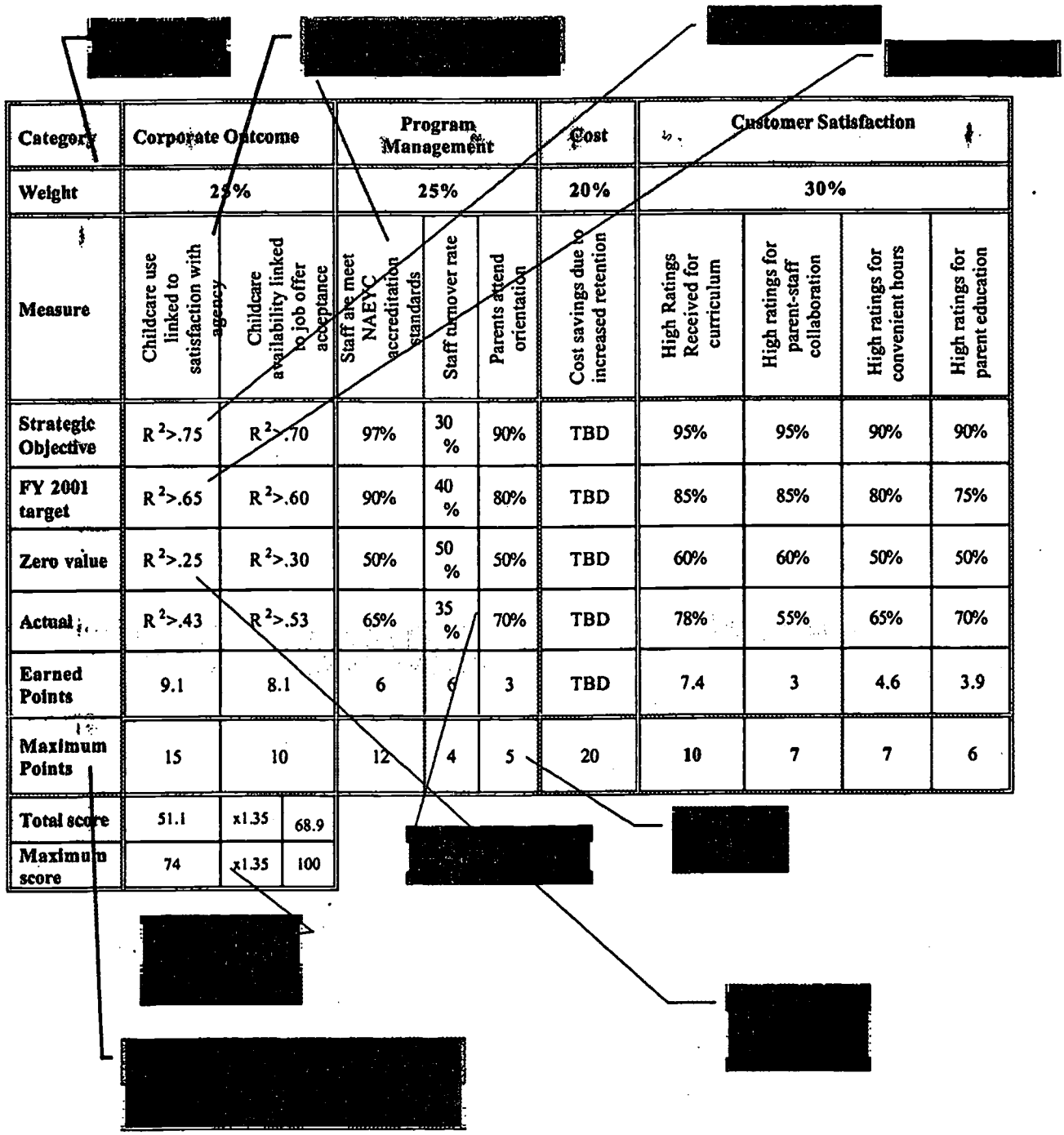
Hypothesis 7. Employees who use the relocation assistance program will report fewer hours away from work handling moving-related errands than employees who relocate but do not use the program.

Hypothesis 8. Employees who use FAP will exhibit higher satisfaction with the organization than employees who do not.

Results

The basic BSC development and implementation process involves four steps: (1) defining overall organizational performance goals and relevant indicators for measuring goal achievement, (2) communicating information about goals and measures to work units, (3) establishing performance targets and measurement procedures within units, and (4) using measures (performance data) to determine if goals have been achieved and re-define performance

Figure 2. Hypothetical Scorecard: On-site Childcare



Category	Corporate Outcome		Program Management			Cost	Customer Satisfaction			
Weight	25%		25%			20%	30%			
Measure	Childcare use linked to satisfaction with agency	Childcare availability linked to job offer acceptance	Staff are meet NAEYC accreditation standards	Staff turnover rate	Parents attend orientation	Cost savings due to increased retention	High Ratings Received for curriculum	High ratings for parent-staff collaboration	High ratings for convenient hours	High ratings for parent education
Strategic Objective	R^2>.75	R^2>.70	97%	30 %	90%	TBD	95%	95%	90%	90%
FY 2001 target	R^2>.65	R^2>.60	90%	40 %	80%	TBD	85%	85%	80%	75%
Zero value	R^2>.25	R^2>.30	50%	50 %	50%	TBD	60%	60%	50%	50%
Actual	R^2>.43	R^2>.53	65%	35 %	70%	TBD	78%	55%	65%	70%
Earned Points	9.1	8.1	6	6	3	TBD	7.4	3	4.6	3.9
Maximum Points	15	10	12	4	5	20	10	7	7	6
Total score	51.1	x1.35	68.9							
Maximum score	74	x1.35	100							

goals and indicators. Currently, the first three steps have been completed and the fourth step will be conducted after data collection is completed. Used in conjunction with a thorough review of existing research, the approach functions well for developing a performance measurement system. It provides a common framework for developing performance objectives and for reporting results that can be tailored to individual program areas. Agency leaders believed the BSC would provide a common focus for the organization and it proved to be effective for establishing goals and objectives that apply to different programs and accommodate program-specific performance standards and data collection. However, this approach is not without shortcomings. Development required intensive participation of agency management and field staff. Agency QOL program mangers dedicated numerous hours to development of the business plan over a 12-month period. The managers participated in six day-long work sessions, reviewed materials independently, and facilitated the review by field staff. Moreover implementation of a BSC requires commitment of resources for planning and training. The required level of investment was achieved because the QOL program director supported the effort by setting expectations for staff and providing resources needed to fund contractor activities, hold work sessions, and provide materials. When fully implemented, a BSC data management system will permit on-going performance tracking from all levels of the organization and provides diagnostic information to address problems. When this agency's data management system is implemented, performance data will facilitate tracking progress by program staff at multiple locations. Data can also be used to modify program plans. Thus, a BSC system can foster communication between levels and across functional areas in an organization. Achieving this enhanced communication is not easy. This project required hiring an external contractor to develop and maintain a database, requiring substantial time and financial resources. In addition, skilled IT staff who understand the difficulties in combining data from several electronic sources of different configuration are necessary.

Conclusions and Recommendations.

Despite some evidence that QOL programs contribute to corporate outcomes, literature review findings were inconsistent. A recurring criticism was that measures were not tied to program activities and were not developed by program staff that could inform predictions. These shortcomings were addressed by applying a BSC approach that requires intensive involvement of staff in the specification of goals, objectives, and measures. However, although the BSC model appears to be relatively simple, developing and implementing a BSC management system is a complex, labor-intensive process in which numerous obstacles can arise. First, the time required for developing and implementing a BSC system is much more than Kaplan and Norton's 16-week estimate. Interruptions of several months occurred in the development of the QOL performance monitoring system. Nevertheless, three years were required to complete preliminary research and work through the design process. Additional time will be required to develop the necessary database. Second, the BSC requires an elaborate, complex data management system to deliver tracking and diagnostic information that foster communication. The complexities of database development are gradually becoming apparent as the implementation process begins and more development time is required than was anticipated. Third, there are several issues the BSC literature does not address. There is no discussion of instrument development and data management procedures. While these issues are being resolved in the current effort, it required more resources and time than anticipated. In addition, the BSC literature gives no guidance about achieving consensus on performance targets, appropriate measures, and data interpretation procedures. Achieving consensus requires skilled facilitation and staff determined to define a simple, workable system. Finally, data management is potentially the most serious obstacle to use of the BSC. Organizations contemplating a BSC management system should be aware of the data management issues so that they can anticipate cost implications before embarking on development. To meet data management requirements for this agency, a team of IT consultants will build an SQL-based data warehouse capable of integrating data for four program areas and five data sources. Furthermore, to make the BSC data management system accessible from computers at any level in the agency, and to allow employees at all levels to track performance, many security management issues need to be dealt with.

Effects on Corporate Outcomes

Conclusions cannot yet be drawn regarding the effects of QOL programs on corporate outcomes. However, once data are collected and analyzed we should be able to make data-based program recommendations. The hope is that QOL programs will be associated with greater retention, increased satisfaction, reduced stress, and reduced absenteeism. Program effectiveness at producing such outcomes is an important indicator of success. If, in fact, such programs are linked to corporate outcomes, this provides a strong argument for continued funding. However, if not linked to outcomes valued by the organization, it becomes more difficult to justify the resources necessary to maintain and grow them. Thus, while implementation of such a BSC management process is costly in time and

money, it may be more costly not to evaluate. Information obtained from this performance management system is critical in making effective program decisions, and ensuring program offerings facilitate the achievement of the organization's goals.

Contributions to HRD

This paper describes the development of a performance monitoring system created by integrating the BSC approach and a quasi-experimental design to evaluate Quality of Life programs. Program evaluation is an important topic in HRD, given the usefulness of evaluation in demonstrating the importance of HRD activities to upper management. Yet the implementation of thorough evaluation programs remains a challenging aspect of HRD practice. While clearly demonstrating programs facilitate learning, change behavior, and lead to desirable organizational results is superior evaluation to asking participants if they like the programs, in reality most organizations still use brief reaction forms as their sole means of program evaluation (Bassi, Benson, and Cheney, 1996). These circumstances have prompted diverse reactions from researchers from promoting the abolition of participant reactions (Holton, 1996) to suggesting empirical work to enhance the development of reaction forms which might be more useful to organizations (Morgan and Casper, in press). While HRD practitioners often find themselves in challenging predicaments in which they must show program effectiveness, yet have little financial resources to do so, for programs to remain in spite of downsizing and cost-cutting, we must demonstrate their worth. For public sector employers, the need for thorough evaluation may perhaps be greater. Not only is it desirable for government agencies to go beyond reactions to evaluate programs, it is now mandatory if agencies are to comply with the Government Performance and Results Act. In response, many agencies are jumping on the Balanced Scorecard bandwagon. This paper demonstrates that while the Balanced Scorecard is clearly one useful approach to evaluation, (1) there are numerous implementation challenges that need to be managed, and (2) it is a more comprehensive evaluation when integrated with traditional forms of research design. In providing discussion of developing and implementing a BSC evaluation system, this paper serves as a tutorial for setting up a BSC evaluation, as well as alerts evaluators potential challenges to implementation of such an approach.

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Validating a Tool to Measure Customer Service Competencies

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This study represents an extension of work to determining customer service competencies undertaken by Russ-Eft, Berrey, Boone, and Winkle (2000). The present study used the critical incidents that formed the basis of the previous work and the resulting competencies to develop and validate a tool to assess service competencies. Data were gathered from 885 customer service personnel in 10 different organizations. Results from the factor analysis and reliability analyses are presented and discussed. Recommendations concerning the role of rigorously researched instruments.

Keywords: Customer Service, Competency Assessment, Instrument Validation

Problem Statement

In a highly competitive global business climate, more and more organizations are recognizing the pivotal role of service in attracting and retaining customers (Hart & Johnson, 1999; Jevons & Pidgeon, 1999). Seeking to create a customer base that is not merely satisfied, but wildly enthusiastic and loyal, these organizations are eager to learn from research which behaviors and competencies make a difference in customer service providers. In this context, identifying and measuring customer service competencies within organizations becomes critical. Previously, Russ-Eft, Berrey, Boone, and Winkle (2000) investigated and identified a comprehensive set of service competencies. The present study describes the development and validation of an instrument designed to measure those competencies.

Theoretical Framework

Although both the practitioner and the academic literature have paid considerable attention to customer concerns, investigation of the competencies needed by customer service providers and others within organizations to win and maintain customer loyalty have drawn minimal attention. Models of customer service competencies appear or can be gleaned from the following: Berry, Parasuraman, and Zeithaml (1994), Bhote (1996), Bitner, Booms, and Tetreault (1990), Corcoran et. al. (1995), Learning International (1991), Levesque (1995), and Zemke (1995). A review of these models, all of which were developed in the late 1980s or early 1990s, reveals at least three competencies common across the various reports: (1) listening and communicating, (2) being reliable, consistent, and dependable, being respectful, courteous, and fair, and (3) solving problems.

Note, however, that only the Berry et. al. (1994), Bitner et. al. (1990), Corcoran, Petersen, Baitch, & Barrett (1995), and the Learning International (1991) studies were based on primary data collection. The first used various focus groups and surveys of customers and interviews of customer service personnel; the second used critical incidents gathered from customers; and the latter two used interviews with managers and customer service personnel or sales personnel.

As organizations enter the 21st century, decision-makers in organizations identified four business challenges facing customer service (Russ-Eft, et al, 2000):

- The customer's need for value balanced against the shareholder's need for profit.
- The customer's need for special attention balanced against the manager's need for productivity.
- The organization's need to appeal to more "profitable" customers balanced against its commitment to

serve all customers

- The customer's new demands balanced against the organization's ability or willingness to meet those demands.

In light of the need for a current examination of customer service competencies, Russ-Eft et al (2000) undertook and reported on such a study involving over 2,100 critical incidents, gathered from frontline service representatives, others in the organization, and customers. Five major customer service factors emerged from the analysis The resulting **SERVE**™ model provides a comprehensive view of service behaviors and beliefs:

- See the "big picture" and how customer service fits into it
- Establish an authentic human connection with each customer
- Render timely, accurate and thorough service
- Value and respond to unique customer needs
- Extend a hand to repair and strengthen relationships with customers who are upset or angry.

Figure 1 presents a description of the five factors.

Competency	Description
See the "big picture and how customer service fits into it.	Understands organizational, customer, personal/job consequences; helps, trains colleague; compensates for colleague's error, failure or absence; fixes product or system; develops new system.
Establish an authentic human connection with each customer.	Avoids phone frustration; calms upset customer; makes customer feel valued; acts with patience; provides friendly, courteous service.
Render timely, accurate and thorough service.	Gathers information; listens; helps customer through the process; thoroughly explains services/procedures; keeps customer informed; follows up; solves problem; finds alternate product or service; expedites request; takes action that was the responsibility of other departments; provides complete and detailed service.
Value and respond to unique customer needs.	Bends rules involving information, price or fees, procedures, warranty/insurance; accommodates special need or request; responds to urgent request; works off-hours to complete request; gives extra service beyond those contracted; does a kind act; fixes a customer's mistake; provides extras.
Extend a hand to repair and strengthen relationships with customers who are upset or angry.	Recovers by speeding up process, payment/price accommodation, giving special attention, fixing the problem; replacing product/service, having manager solve the problem; goes outside organization to help customer; calls another organization to complete own job; helps confused customer who called the wrong organization; refers customer to competitor or other service.

Figure 1. Description of Customer Service Competencies

Recently the Job Analysis and Competency Modeling Task Force, a work group jointly sponsored by the Professional Practice Committee and the Scientific Affairs Committee of the Society for Industrial and Organizational Psychology, published a review of work in both competency modeling and job analysis. As part of its analysis, the Task Force set forth some recommendations for competency modeling and validated instruments. The Task Force created a level-of-rigor scale and described "high rigor" as characterized by "a variable combination and logically selected mix of multiple methods used" (Schippmann et al, 2000, p. 716). Given this recent recommendation and its definition of level of rigor, it may be important to add additional quantitative analyses to supplement the qualitative analyses in order to assess the **SERVE**™ competency model.

Research Questions

Having developed the competency model outlined above, we turned to the creation and validation of an instrument to measure these competencies. At this point, three key research questions were:

- What factors emerge from such an instrument?
- How do these factors correspond with the **SERVE**™ model?
- What is the reliability of such an instrument?

Method

Instrument

The instrument developed for the present study was based on the **SERVE**™ model, and items were based on the critical incidents from the Russ-Eft et al (2000) study. Each item stated a behavior or a belief, such as "Greet each customer in a friendly manner" or "Stay calm when others are upset or angry." Respondents used a seven-point Likert-type scale to indicate the extent to which they exhibit the behavior or hold the belief. A response of 1 means "Not at all," a response of 4 means "About 50% of the time," and a response of 7 means "100% of the time." Respondents were also asked how important they believed the behavior is to the effective performance of customer service. Here, 1 means "Not at all important," 4 means "Somewhat important," and 7 means "Very important." For validation purposes, only the responses to the scale asking for ratings of "extent to which the respondent exhibits the behavior or holds a particular belief" were used.

Approximately 90 items were drafted. Content experts in customer service reviewed the items for content and clarity. Seventy-seven items were retained for use in this study.

Subjects

The participants in this study were employees from ten different organizations, covering a variety of industries including higher education, insurance, business services, heavy manufacturing, and wholesale trade. Due to the way the instruments were distributed, the researchers do not know how many employees received a questionnaire, however, 885 instruments were returned. Of these, the majority of the participants were women (65%). The age category checked most frequently was 26 to 35 (37%). In general, the participants were well educated. Only 1% had not completed high school; of the remainder, 19% were high school graduates. The majority of participants had some higher education, whether vocational/technical studies (42%), a bachelor's degree (27%) or a master's degree or higher (7%). Nearly three-fourths of the participants had had some previous training in customer service skills (73%).

Procedure

A coordinator within each organization was contacted by telephone and asked to distribute questionnaires. Typically, this coordinator was someone in the Human Resources or Training department of the organization.Each subject received a questionnaire and a self-addressed stamped envelope for returning it.

Analyses

A principal-components factor analysis was undertaken, and items were deleted based on cross-loadings. After these deletions, Cronbach's alpha was calculated to determine internal consistency. Then an alpha "if item deleted" was calculated to determine the effect on the alpha when items were deleted from the scale.

Results

The total number of respondents was 885. Of these, 24 had 20% or more missing responses. These cases were removed from the analyses due to incomplete data. Thirteen participants indicated a response of 7 more than 90% of the time. Due to the lack of variance, this group was also removed from the analyses.

Prior to conducting the analyses, the item responses were checked for normal distribution. Every item was significantly negatively skewed; that is, the responses tended to be clustered at the top end of the scale. In addition,

almost every item had negative kurtosis, meaning that the responses were clustered together more tightly than would be expected in normal distribution. The five items with the worst skew and kurtosis were removed from the analyses, reducing the number of items analyzed to 72.

A visual inspection of the item response distributions revealed that, although the skew was significant, it was not extreme. Furthermore, the skew was in the same direction for every item. Given the relatively large sample size, nonnormality is unlikely to have an effect on the analyses. In addition, Waternaux (1976) states that, with positive kurtosis, underestimation of variance disappears with samples of 200 or more.

Within the 848 cases included in the analyses, approximately 0.5% of the data were missing. A T-test was conducted to check for differences between respondents who answered every question and those who skipped at least one, but fewer than 15. No differences were found, (t = .312, df = 846, p = .755). This implies that there are no systematic differences between the two groups. Based upon that conclusion, missing data for an item was replaced with the overall mean for that item. Replacing the missing data allowed the retention of these respondents in the factor analysis.

The final sample of 848 resulted in a respondent to item ratio of 11.8 to 1. A ratio of between 5 to 1 and 10 to 1 is recommended for undertaking a factor analysis (Hair, Anderson, Tatham & Black, 1995; Nunnally & Bernstein, 1994).

Factor Analysis

Prior to conducting factor analysis, the data set was tested for factorability. An inspection of Pearson's correlations shows that there are numerous correlations above 0.3, indicating that factor analysis is appropriate for this data set. The data set also meets the criteria for the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO = 0.96, values of .6 and above are required for good factor analysis (Tabachnick & Fidell, 1996). A principal components factor analysis was conducted using the 72 remaining items from the questionnaire. Principal components is appropriate for this type of study, because it will provide a unique mathematical solution that may help determine the number and nature of the underlying components (Tabachnick & Fidell, 1996). Since this study is the first use of this instrument, such an exploratory analysis is required.

For the analysis, all factors with an eigenvalue greater than one were retained. An eigenvalue is a measure of variance accounted for by the factor. An eigenvalue of one means that the factor accounts for approximately the same amount of variance as an individual item in the analysis. In this analysis, there were fourteen factors with eigenvalues greater than one. An inspection of the scree plot yields no evidence that would indicate a different number of underlying factors. The total variance explained is 55%.

To facilitate interpretation, the factors were rotated. An inspection of the factor correlations when the factors were rotated obliquely show that the factors were not substantially correlated with one another (only two correlations were above 0.3, and approximately two-thirds of the correlations were below 0.2). Therefore, an orthogon (Varimax) was used for the remaining analyses. An examination of the rotated factor loadings revealed several items that loaded on more than one factor, and furthermore, there were several factors with only one item with a major (>0.30) factor loading. To clarify the factors, this analysis was repeated several times, and each time some of the cross-loading items were eliminated. The final factor analysis consists of 49 items. As the number of items was reduced, the factors coalesced into nine factors. Table 1 presents the nine factors, the average loading on the major factors, the average loading on the minor factors, and the percentage of variance explained. The average loadings were calculated using the absolute value of the loadings.

These nine factors can be mapped with accuracy to the competencies developed in the critical incident study. For example, two factors, *Being a Customer Service Advocate* and *Supporting Your Coworkers)* map onto the "S" competency of "See the "big picture and how customer service fits into it." *Providing Core Customer Service* focuses on aspects of the "E " competency, "Establish an authentic human connection with each customer." Both *Follow Through* and *Providing Information to Customers* pertain to providing attentive service to customers and can be related to the "R" competency: "Render timely, accurate and thorough service." Two factors, *Beyond Core Customer Service* and *Dealing with Diverse Customers,* mirror aspects of the "V" competency: "Value and respond to unique customer needs." *Coping with Difficult Customers/Situations* fits with the "E" competency: "Extend a hand to repair and strengthen relationships with customers who are upset or angry." In addition to these dimensions of the **SERVE**™ model, another factor emerged that was labeled *Organizational Support for Customer Service.*

Table 1. Factor Analysis Results

Factor	Number of Items	Avg. Loading – Major Factor	Avg. Loading – Minor Factor	% Variance Explained
Providing Core Customer Service	14	.57	.21	13.4%
Beyond Core Customer Service	6	.54	.15	6.5%
Follow Through	5	.61	.13	5.8%
Providing Information to Customers	6	.49	.15	5.6%
Coping with Difficult Customers/ Situations	4	.56	.15	5.6%
Being a Customer Service Advocate	5	.55	.11	4.8%
Organizational Support For Customer Service	4	.52	.12	4.5%
Dealing with Diverse Customers	3	.52	.12	3.8%
Supporting Your Coworkers	2	.72	.09	3.2%

Reliability

After eliminating some items, as described above, and after determining the factors using the resulting 49-item instrument, the survey was measured for internal consistency among its factors using Cronabach's alpha. Alpha is an indication of the proportion of the variance in a scale score that can be attributed to differences in the underlying construct. Table 2 presents these data.

The overall reliability was .94, with reliabilities for the sub-scales ranging from .55 to .90. An alpha above .70 is generally considered acceptable, although .65 to .70 may be considered minimally acceptable (DeVellis, 1991). Three sub-scales, *Organizational Support for Customer Service, Dealing with Diverse Customers* and *Supporting Your Coworkers* had alphas lower than .65. This is most likely due to the relatively small number of items in these subscales.

Conclusion

This study investigated the validity and reliability of an instrument to measure customer service competencies, and it provided cross-validation evidence of the **SERVE**™ competency model presented by Russ-Eft et al (2000). In doing so, it followed the level of-rigor standards for competency modeling and job analysis studies set forth by Shippmann et al (2000).

Holton, Bates, Ruona, and Leimbach (1998) argue that such validation studies are critical for instruments used by HRD professionals. "With psychometrically strong instrumentation, HRD will be in a position to provide more definitive answers to questions. Without reliable instrumentation, researchers will be limited in their ability to arrive at conclusions and prescriptions" (p. 487 - 488). Although these authors were concerned about measuring transfer climate, the same arguments can be made for developing and validating instruments to measure job competencies.

Table 2. Cronbach's alpha for each factor.

Factor	Alpha	Number of Items	Range of Item-Total Correlations	Scale Mean (Std. Dev.)
Providing Core Customer Service	.90	14	.49-.72	6.24 (.55)
Beyond Core Customer Service	.81	6	.43-.68	5.60 (.89)
Follow Through	.78	5	.49-.66	5.63 (.98)
Providing Information to Customers	.75	6	.39-.57	6.07 (.63)
Coping with Difficult Customers/ Situations	.70	4	.45-.52	5.64 (.83)
Being a Customer Service Advocate	.74	5	.48-.56	5.54 (.96)
Organizational Support for Customer Service	.60	4	.27-.46	5.33 (.87)
Dealing with Diverse Customers	.58	3	.38-.41	5.86 (.92)
Supporting Your Coworkers	.55	2	.38	6.15 (.81)

The present study follows the recommendations of both Shippmann et all (2000) and Holton et al (2000) by supplementing the results of previous qualitative work using a critical incident method with a quantitative examination of the same concepts.

Limitations

All of the items in this instrument showed significant negative skew in the distribution of participant's responses. While this did not seem to cause difficulties for the analyses presented here, it may continue to be an issue for the reporting of scale scores and other results.

There are several possible explanations for the high responses to the items in this instrument. First, 622 (73%) of respondents reported having received customer service training prior to completing the questionnaire. The high proportion of respondents receiving training could account, in part, for the high responses. A t-test was conducted to determine whether participants with prior training had higher scale scores. The difference between those with prior training and those without was small, but significant, (t = 3.47, df = 814, $p<.01$). The mean scale score for those with prior training was 5.87, and 5.71 for those without prior training (on a seven-point scale). In one sense, this may present a limitation, in the sense that the data may have been affected by such difference. In another sense, this result may provide some additional evidence of validity in that it showed a significant difference between individuals who had had previous training and those who did not.

Second, the skills identified as important to good customer service have a certain degree of social desirability. Social desirability is a problem when one response is more socially acceptable than another or when a respondent tends to report "good things" about himself or herself (Edwards, 1957). In this situation, a respondent may choose the socially desirable answer rather than the one that most closely reflects his or her behavior. This is not to suggest that people are lying regarding their behavior; rather, they believe that they are following socially accepted norms and answer accordingly. The problem of social desirability may be more likely to arise when a

questionnaire asks for respondents' perspective on their own performance only. Social desirability may be less of an issue when a questionnaire reflects an organizational perspective or a second–party perspective (e.g., when managers rate their direct reports and not themselves).

Re-framing the questions may help reduce the degree of social desirability in the scale. One option is to change the survey from the self-perspective to a group perspective. Such a change would ask participants to rate the practices of their customer service group as opposed to their own behavior. The respondents' beliefs about their own skill levels might be tempered by their observations of their coworkers. Another option would be to include a social desirability rating for each service item. Customer service items that show strong correlations with the social desirability scale would then be considered for exclusion. However, if there is, indeed, a strong element of social desirability in the underlying construct itself, then exclusion of these items may undermine the quality of the entire instrument.

Third, the study was undertaken with customer service personnel within the United States. We cannot be certain that the same results would emerge using personnel located in other countries and other cultures. This would require studies in separate countries and cultures.

Implications for HRD Research and Practice

Along with the work of Holton et al (1998), this study describes efforts to develop and validate standard instruments for use by HRD researchers and practitioners. Such studies can help other researchers as they examine competencies needed for specific roles or jobs within organizations, as well as other factors critical to the advancement of learning and performance within organizations. Furthermore, the present study provides an example of supplementing qualitative work in the area of competency analysis and assessment work with quantitative analyses.

The instruments from such quantitative analyses examining reliabilities and factor structures provide practitioners with measurement tools to enhance learning and performance in organizations. Well-researched instruments can play a vital role in determining initial knowledge, skill, and competency gaps. Such information can assist practitioners to focus on the needs of individuals, groups, and organizations.

In addition, such instruments provide critical tools in evaluating whether a specific learning and performance intervention resulted in targeted improvements. They can be used before and after training to determine competency improvements. They can also be used in post-training designs to ascertain whether competencies have reached a specified and pre-determined level.

Finally, by using these instruments in both needs assessment and evaluation efforts, further research can be undertaken concerning the psychometric qualities of the instruments. So, with the customer service instruments, for example, data can also be gathered from customers through customer satisfaction surveys. Then one could undertake concurrent validation efforts comparing the results from the **SERVE**™ instruments with the customer satisfaction surveys.

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