

CONSTRUCT VALIDATION OF THE PERCEIVED WELLNESS SURVEY

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Abstract: Recently, the Perceived Wellness Survey (PWS) was introduced as a measure of perceived health. The purpose of the current study was to assess the construct validity as well as the temporal stability of the PWS. Six samples collected over a three year period were divided into quartiles based on PWS scores. One-way ANOVA with post hoc analyses were conducted to determine if the highest and lowest PWS quartiles were different with respect to several theoretically related independent measures. The results provide additional support for the construct validity of the PWS. In addition, the PWS appears to be reasonably stable. The PWS fills a void in perceived health research and demonstrates potential utility as a research tool. [*Am J Health Studies* 1998; 14(4): 212-222.]

A compelling body of both anecdotal (Borysenko, 1987; Chopra, 1989; Cousins, 1979; Moyers, 1993) and empirical evidence (Bennett, Benson, & Kuiken, 1986; Carney et al., 1988; Disbrow, Bennett & Owings, 1993; Goleman & Gurin 1993; Pelletier, 1992; Pelletier & Herzing, 1987) supports the notion that mental condition has a very real and powerful influence upon the health of the body. This collection of evidence supports the belief that the mind and the body reciprocally interact to influence overall health and well-being, and provides the foundation for what has been called a "mind-body" model (Pelletier & Herzing, 1987). Specific models that integrate cognitive and biological components have been proposed by several authors (Jasnoski & Schwartz, 1985; Seeman, 1989; Wilson & Cleary, 1995). Most recently, Wilson and Cleary (1995) developed a model of patient care that integrates several components in-

cluding biological and physiological variables, symptom status, functional status, and general health perceptions, among others. The inclusion and status of health perceptions in this model make it unique. The authors conclude that perceptions of health "represent an integration of . . . health concepts . . . and are among the best predictors of the use of general medical and mental health services" (p. 62).

The overall impact of perceptions on health is supported by several researchers who have suggested that individual health perceptions are valid indicators of future health outcomes even after statistically controlling for confounding variables (Idler & Kasl, 1991; Kaplan & Camacho, 1983; Mossey & Shapiro, 1982; Singer, Garfinkel, Cohen & Srole, 1976; Stewart, Hays, & Ware, 1992). Although intriguing, most health perception research has been conducted using one item measures of global health (Idler & Kasl,

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1991; Kaplan & Camacho, 1983; Mossey & Shapiro, 1982; Singer, Garfinkel, Cohen & Srole, 1976). However, it is widely accepted that health is a multi-faceted construct (Croese, Nicholas, Gobble & Frank, 1992; Greenberg, 1985; Nicholas, Gobble, Croese & Frank, 1992; Whitmer & Sweeney, 1992; WHO, 1964). Thus, as the mind-body research effort expands, the use of philosophically congruent, multi-faceted health measures becomes increasingly important.

Recently, the Perceived Wellness Survey (PWS) was introduced as a multi-faceted measure of perceived health (Adams, Bezner, Steinhardt, 1997). As recommended by several theorists (Croese et al., 1992; Greenberg, 1985; Nicholas et al., 1992; Whitmer & Sweeney, 1992), the PWS integrates several components of perceived wellness by simultaneously accounting for the magnitude of each and the balance among them (Adams et al., 1997).

In the initial study, the PWS demonstrated evidence of total scale internal consistency in four separate samples ($\alpha = .88$ to $.93$). Principal axis factor analysis supported the underlying perceptual nature of the scale and an estimate of face validity ($n=36$) was statistically significant ($p=.05$), suggesting that in the initial study samples, the PWS was a valid and reliable measure of perceived wellness (Adams et al., 1997). In short, the PWS, as a multi-faceted measure of wellness perceptions, has shown early

promise as a useful and psychometrically sound scale. The purpose of the current study was to provide further evidence supporting the construct validity of the PWS and to discuss possible applications of such a tool.

METHODS

PARTICIPANTS

Three corporate and three student convenience samples were used in this study: 1) employees of 3M in Austin, TX ($N=380$); 2) employees of an Information Technology Company in Austin, TX ($N=178$); 3) employees of St. David's hospital in Austin, Texas ($N=238$); 4) undergraduate health education students ($N=105$) at The University of Texas at Austin; and 5) two sets of undergraduate students enrolled in a leadership program at Oklahoma State University ($N=81$ and $N=95$). The demographic profile for each sample is included in Table 1.

DATA COLLECTION

The corporate samples were recruited during their respective annual health screenings by letter, flyer, or by poster near building entrances and cafeterias. Students were recruited by a general announcement made in class by the principal investigator. All six samples had the opportunity to read and sign an informed consent document ap-

Table 1
Demographic Characteristics by Sample

Sample	Gender ^a	Mean age ^b	White% ^c	Black%	Asian%	Hispanic%	Other%
3M	380 (61)	41.1±10.8	269 (68)	29 (7)	44 (11)	42 (11)	9 (2)
Dell	178 (47)	39.8±11.8	127 (68)	13 (7)	15 (8)	23 (12)	3 (2)
Hospital	238 (20)	38.5±9.3	203 (84)	11 (5)	4 (2)	13 (5)	10 (4)
UT	105 (81)	23.2±5.4	94 (84)	6 (5)	1 (1)	11 (10)	0
OSU 1 ^d	81 (60)	19.0±1.0					
OSU 2 ^d	95 (60)	19.0±1.0					
Total ^e	1077 (51)	35±8.5	693 (77)	59 (7)	64 (7)	89 (10)	22 (2)

a = total number of participants and (percentage) of females

b = the standard deviation is in parentheses

c = number and (percentage) of each group are reported

d = race was not a variable in these samples

e = percentages may not total 100% due to rounding

proved by an institutional review board for research with human subjects prior to making the decision whether or not to participate. In addition, participants were able to cease participation without consequence. Students were assured that their participation status would not influence their class outcome. In all cases, survey instruments were administered in a quiet classroom setting and required approximately 40 minutes to complete.

INSTRUMENTATION

Dependent Measure, Perceived Wellness Survey (PWS)

The PWS is a measure of wellness perceptions in each of six separate subscales including: physical, spiritual, psychological, social, emotional, and intellectual. Sample items from each dimension are respectively: "I expect to always be physically healthy," "I believe there is a real purpose for my life," "In the past, I have expected the best," "My friends will be there for me when I need help," "In general, I feel confident about my abilities," and "In the past, I have generally found intellectual challenges to be vital to my overall well-being." Each dimension is represented by six items which are scored from 1, "Very strongly disagree," to 6, "Very strongly agree."

Several features make this scale unique. First, the subscale scores are integrated by combining the *magnitude* (mean) of each subscale with the *balance* (standard deviation) among the subscales into a wellness composite score. In mathematical terms, the wellness composite score equals the sum of the subscale means divided by the standard deviation among subscale means plus a constant. The constant in the denominator prevents a rare but statistically possible deviation of "0" from nullifying the wellness composite score. To our knowledge, this is the only wellness measure that simultaneously accounts for both wellness magnitude and balance. According to wellness theorists, balance is a particularly important aspect of wellness (Greenberg, 1985; Crose et al., 1982; Travis & Ryan, 1988). Procedures for scoring the PWS are available elsewhere (Adams et al., 1997) or they can be obtained from the first author. Composite PWS scores range from 3 to 29, with

higher scores indicating greater perceived wellness.

Second, the PWS addresses the same basic components of wellness as other wellness measures (Ardell, 1986; Hettler, 1984; Travis & Ryan, 1988) but includes a more thorough degree of scientific rigor in the development process (Palombi, 1992). Finally, the PWS is founded firmly on perceptual, as opposed to clinical, physiological or behavioral variables.

INDEPENDENT MEASURES

Because six samples were included in this study, discussing all of the independent measures in thorough detail would be tedious. Instead, the name of each independent measure, corresponding reference, and a brief definition are included in Table 2. Means and standard deviations, internal consistency coefficients (μ), high and low perceived wellness means, and F values are listed in Table 3.

ANALYSES

Because each sample contained different independent variables, each was analyzed separately. In each sample, the normality assumption for the dependent variable was examined and in every case was met. Each sample was then divided into four equal groups based on the PWS scores. To determine the association of each independent variable to the PWS, a series of One-way ANOVA with Tukey's HSD post hoc analyses were performed. The primary relationship of interest was whether the highest and lowest perceived wellness quartiles were significantly different. The criterion for statistical significance in every analysis was set at $p = .05$.

Temporal stability was also assessed in the 3M sample and in one of the University of Texas student samples. Thirty subjects at 3M were mailed the PWS with a self-addressed stamped envelope and a written request to return the survey. The range of response times for the 19 respondents (63%) was 17 to 34 days. The University of Texas student sample ($n = 54$, 53%) completed the PWS in a 10 day, quiet classroom, test-retest procedure.

Table 3
Independent Variable Means, Standard Deviations, Internal Reliability Coefficients, and F values

Variable	Sample	Alpha	Overall Mean±SD	High PWS Mean	Low PWS Mean	F (DF)	p
Biometric Measures							
Total Cholesterol	St. David's Hospital	NA	196.6±39.2	191.3	212.2	3.66 (3,200)	.01
Total Cholesterol	3M	NA	201.0±38.5	193.0	205.5	1.77 (3,107)	NS
Diastolic Blood Pressure	St. David's Hospital	NA	75.78±10.1	75.0	77.6	.89 (3,232)	NS
Diastolic Blood Pressure	3M	NA	69.75±10.7	69.9	70.5	.55 (3,377)	NS
Behavioral							
Functional Health	St. David's Hospital	.78	28.7±2.1	29.3	28.0	5.43 (3,234)	.00
Physical Activity Index	St. David's Hospital	NA	2208±1482	2504.4	1755.2	2.95 (3,229)	.03
Physical Well-Being	St. David's Hospital	.76	82.3±10.1	27.4	73.8	29.09 (3,234)	.00
Physical Activity	3M	NA	2.3±1.2	2.5	1.9	5.97 (3,375)	.00
Perceptual/Attitudinal							
Principle Centered Living	St. David's Hospital	.90	132.2±13.1	140.4	122.2	27.01 (3,233)	.00
Principle Centered Living	Information Tech	.90	124.4±12.1	133.5	118.2	15.1 (3,167)	.00
Principle Centered Living	3M	.88	129.1±13.4	136.8	120.5	30.61 (3,369)	.00
Principle Centered Living	OSU student group 2	.90	133.3±14.9	141.7	125.2	5.66 (3,90)	.00
Principle Centered Living	UT student group	.82	124.6±12.0	134.5	114.8	17.23 (3,102)	.00
Sense of Coherence	Information Tech	.81	64.5±10.4	71.9	58.4	18.67 (3,172)	.00
Sense of Coherence	3M	.86	67.5±13.0	76.7	58.4	51.99 (3,372)	.00
Sense of Coherence	UT student group	.85	62.6±11.3	72.2	53.2	19.97 (3,102)	.00
Job Control	Information Tech	.81	3.6±.7	4.0	3.4	4.87 (3,173)	.00
Organizational							
Communication	Information Tech	.69	3.0±.7	3.2	2.8	5.03 (3,173)	.00
Job Satisfaction	Information Tech	.73	3.8±.7	4.0	3.7	2.79 (3,174)	.04
Resilience	Information Tech	.75	62.7±7.5	67.6	58.8	11.25 (3,168)	.00
Assertiveness	OSU student group 1	.81	1704±2.9	19.4	15.5	11.42 (3,77)	.00
Competence/Effectiveness	OSU student group 1	.92	65.9±8.0	73.2	62.3	10.64 (3,77)	.00
International Harmony & Equality	OSU student group 1	.75	52.7±5.5	55.8	51.0	3.29 (3,77)	.02
Positive Orientation to Others	OSU student group 1	.93	72.3±9.4	80.2	67.8	8.44 (3,77)	.00
Religious Commitment	OSU student group 1	.80	21.0±4.4	23.1	18.4	4.32 (3,77)	.01
Emotional Autonomy	OSU student group 2	.59	4.7±1.8	5.4	4.0	2.52 (3,90)	.06
Salubrious Lifestyle	OSU student group 2	.70	5.8±2.0	6.6	4.6	5.46 (3,90)	.00
Existential Vacuum	UT student group	.78	23.0±7.9	18.4	28.6	9.71 (3,101)	.00
Life Control	UT student group	.71	33.4±5.4	36.5	31.9	4.56 (3,101)	.00
Life Purpose	UT student group	.87	47.5±8.2	52.2	42.0	13.33 (3,101)	.00
Optimism	UT student group	.82	23.9±4.5	27.0	20.4	12.29 (3,101)	.00
Family Self	UT student group	.74	71.4±7.0	75.7	65.7	8.37 (3,59)	.00
Identity	UT student group	.78	140±9.2	147.3	133.7	8.01 (3,55)	.00
Self Regard	UT student group	.80	126.5±12.0	135.8	116.1	10.68 (3,58)	.00
Moral Self	UT student group	.71	71.7±6.9	75.4	68.0	3.17 (3,57)	.03
Personal Self	UT student group	.82	70.0±7.1	75.1	64.0	11.18 (3,59)	.00
Physical Self	UT student group	.81	68.7±7.8	73.4	62.1	8.25 (3,58)	.00
Self Concept	UT student group	.91	389.1±22.3	412.5	363.7	12.4 (3,50)	.00
Social Self	UT student group	.83	70.8±7.4	74.7	65.1	7.36 (3,61)	.00

NA indicates that alpha is not calculable because the variable is either a biometric value or a one item scale.

RESULTS

In all but three analyses, the highest and lowest perceived wellness groups were significantly different providing strong support for the construct validity of the PWS. In all but two instances (emotional autonomy and organizational communication), the independent variables' reliabilities were more than adequate ($\mu = .70$) adding strength to these findings. The high and low perceived wellness group means with corresponding *F* statistics and *p* values are reported in Table 3. Temporal stability estimates ranged from $r = .73$ in the 3M sample to $r = .81$ in the student sample, indicating that in these samples, the PWS was reasonably stable.

DISCUSSION

Individuals from a variety of samples who scored in the highest and lowest quartiles on the PWS appear to possess a number of characteristics and behaviors that are consistent with the PWS theoretical foundation. By definition, individuals who are high on perceived wellness should: 1) be more physically healthy, 2) have a greater sense of meaning and purpose in life, 3) expect that positive things will occur in their life no matter what the circumstances, 4) be more connected with family or friends, 5) be more secure and happy with who they are, and 6) be intellectually vibrant. The current findings support the Perceived Wellness construct and add breadth to this measure.

Several analyses were performed to evaluate the relationship of the PWS to several independent measures. Upon further examination, it was noted that the underlying content of each independent variable seemed to be aligned primarily with one of the six PWS subscales. In the initial study, it was suggested that understanding the breadth of the subscales would be potentially fruitful. Therefore, the collective results are organized according to what might be inferred with respect to each of the subscales.

Physically, a person with high perceived wellness appears to: 1) possess greater functional proficiency for daily activities requiring physical health, 2) make healthier decisions with respect to behaviors such as ex-

ercise and smoking, 3) feel physically healthier, and 4) have a more positive physical self-image. Interestingly, these behavioral and attitudinal characteristics were not reflected in the biometric values. Spiritually, such a person could be expected to: 1) have adopted and to live by an internal set of principles, 2) be committed to a cause or purpose, 3) have a more acutely developed sense of ethical behavior, and 4) see meaning in the world.

In addition, a person with high perceived wellness could be expected, from a psychological perspective to: 1) be more coherent, 2) be more resilient, 3) sense a greater control over the course of life, 4) be more optimistic, and 5) expect better physical and mental health. Socially, such a person would: 1) value social harmony and equality, 2) exhibit towards others positive behavioral attributes such as tolerance, forgiveness, gratitude and generosity, and 3) feel a sense of worth and adequacy about roles within family specifically and society in general.

A person with high perceived wellness could also be expected to intellectually: 1) value competence and effectiveness in cognitive function, 2) feel more involved with job communication processes, and 3) be more satisfied and less stressed with work in general. Finally, the emotional characteristics that would be evident in a person with high perceived wellness include: 1) an ability to perform without reassurance or approval of others, 2) a clear internal picture of core identity, 3) a sense of personal adequacy and self-satisfaction, and 4) higher global self-esteem.

The PWS appears to be reasonably reliable in two demographically distinct samples. This would seem to support the suggestion that subjective health perceptions are stable despite differences in objective health status (Mossey & Shapiro, 1982).

A few limitations of this study warrant mention. First, several samples of convenience were used. Random selection of subjects and use of treatment and control groups would improve the generalizability of results in future research with the PWS. Such studies are currently under way.

Second, it is probable that the subjects, because they were volunteers, were healthier

than the normal population; which would tend to skew the sample distribution towards positive health. Employees who voluntarily participate in health screenings are typically healthier than the normal population (Golaszewski, Lynch, Clearie & Vickery, 1989). In the 3M sample, diastolic blood pressure and several serum indicators of health not reported in this study were indeed slightly skewed in a healthful direction. Thus, caution should be used in applying these findings to less healthy populations.

Third, the PWS and all independent measures were self-reported and are therefore subject to the limitations commonly associated with self-report data (Nunnally, 1978). However, as suggested by others (Idler & Kasl, 1991; Kaplan & Camacho, 1983; Mossey & Shapiro, 1982), wellness perceptions may explain unique variance not accounted for by other variables such as more traditional biological indicators of health. If this were true, self-report variability could be viewed as additional information rather than error to be controlled. However, further research is needed to more clearly elucidate the relationship of perception to other indicators of health.

In conclusion, evidence supporting the construct validity of the PWS has been provided. As an empirically tested, theory-based, psychometric scale, the PWS fills a void in perceived health research and demonstrates potential utility as a research tool. In particular, corporate health professionals, medical outcomes researchers, and epidemiologists should consider its use as a perceptual health variable in combination with other well-established indicators of health.

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