

# Reliability and Validity of the Modified Erikson Psychosocial Stage Inventory in Diverse Samples<sup>1</sup>

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*The Modified Erikson Psychosocial Stage Inventory (MEPSI) is a relatively simple survey measure designed to assess the strength of psychosocial attributes that arise from progression through Erikson's eight stages of development. The purpose of this study was to employ secondary analysis to evaluate the internal-consistency reliability and construct validity of the MEPSI across four diverse samples: healthy young adults, hemophilic men, healthy older adults, and older adults with chronic obstructive pulmonary disease. Special attention was given to the performance of the measure across gender, with exploratory analyses examining possible age cohort and health status effects. Internal-consistency estimates for the aggregate measure were high, whereas subscale reliability levels varied across age groups. Construct validity was supported across samples. Gender, cohort, and health effects offered interesting psychometric and theoretical insights and direction for further research. Findings indicated that the MEPSI might be a useful instrument for operationalizing and testing Eriksonian developmental theory in adults.*

Erikson's theory of psychosocial development is cited frequently in the literature and has been used as a framework for studies of psychosocial development in children and adolescents. Although adulthood is fundamental to Erikson's work, relatively few studies have described or tested this aspect of his theory (e.g., Domino & Affonso, 1990; Erikson, Erikson, & Kivnick, 1986; Ochse & Plug, 1986; Viney, 1987; Wagner, Lorion, & Shipley, 1983; Walaskay, Whitbourne, & Nehrke, 1983-1984). The scant research may be due, in part, to a paucity of relatively simple yet reliable and valid survey measures to operationalize the eight stages of development as they appear in

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the adult. The Modified Erikson Psychosocial Stage Inventory (MEPSI) is an attempt to fill this methodological void.

The purpose of this study was to employ secondary analysis to evaluate the reliability and construct validity of the MEPSI in four diverse samples: healthy young adults, hemophilic men, healthy older adults, and older adults with chronic obstructive pulmonary disease (COPD). Internal-consistency reliability and construct validity were examined within each sample, with attention given to the measure's performance in both men and women. In addition, MEPSI scores were compared across samples to assess, in an *exploratory* manner, the instrument's sensitivity to developmental differences that might exist between age cohorts and between healthy and ill populations.

## BACKGROUND

Erikson (1982) described psychosocial development as a sequence of eight critical stages characterized by crises emanating from the interaction of physical ontogeny, cognitive development, individual experience, and interpersonal relationships. Personality attributes arising from negotiation of these crises comprise the individual's strengths and limitations (Erikson, 1963, 1982). These attributes serve as resources that define one's life trajectory and on which one may draw in times of growth or distress.

Adulthood is seen as a "developmental and conflictual phase in its own right," dominated by two themes, generativity versus stagnation and integrity versus despair (Erikson, 1982, p. 9). These stages, and Erikson's proposition that psychosocial development is a cumulative process, suggest that developmental change takes place during the adult years. Several cross-sectional and longitudinal studies have supported this tenet (Ryff, 1982; Ryff & Migdal, 1984; Whitbourne & Waterman, 1979; Whitbourne, Zuschlag, Elliot, & Waterman, 1992), whereas others have found no psychosocial differences between adult age groups (Gruen, 1964; Farrell & Rosenberg, 1981).

Erikson's assertion that psychosocial growth is a function of the interaction between maturation and culture-specific socialization raises the question of developmental differences between generational cohorts. Differences in developmental strengths between older and younger adults may be a consequence not only of maturation but also of changes in social and historical context (e.g., societal expectations, education, work life, and shifts toward egalitarian attitudes) (Deaux, 1985; Waterman & Whitbourne, 1982; Whitbourne et al., 1992). The literature indicates that generational developmental differences do exist (Baltes, 1987; Baltes, Reese, & Lipsitt, 1980).

Because many developmental studies have been cross-sectional, however, there are virtually no empirical data to indicate the origin or direction of these differences.

There has been debate concerning the applicability of Erikson's theory to women. Miller (1976), Gilligan (1982), and Peck (1986), for example, suggest that there are gender differences in psychosocial development. In particular, these authors believe that women have higher levels of affiliation and intimacy, and men tend to be more autonomous. Although several quantitative studies have supported this proposition, findings to date have been inconclusive (Constantinople, 1969; Eaton, Mitchell, & Jolley, 1991; Gurney, 1980; Hodgson & Fischer, 1979; Tesch & Whitbourne, 1982; Whitbourne, Jelsma, & Waterman, 1982). Gender differences, if they exist, may also vary across age cohorts, again related to disparities in socialization.

Little has been written about the Eriksonian developmental attributes of the chronically physically ill. Theoretically, the existence of ongoing stressors, such as those associated with chronic physical illness, may inhibit development and hinder the reworking of earlier life difficulties (Leidy, 1990; Leidy, Ozbolt, & Swain, 1990). People with hemophilia and COPD, for example, may have fewer psychosocial resources than their healthy counterparts. Adverse psychological characteristics have been found in hemophilic boys, including floating anxiety, feelings of inadequacy, social uneasiness, passivity, resistance, worry, irritability, unhappiness, solitude, and negativism (Handford, Mayes, Bagnato, & Bixler, 1986; Kvist, Kvist, & Rajantie, 1990). These characteristics seem to reflect difficulties with trust, autonomy, initiative, industry, and intimacy. Such problems may be related to protection in childhood, school absences, restricted activity, exposure to the AIDS virus, or problems in daily living (Meijer, 1980-1981; Wilkie, Markova, Naji, & Forbes, 1990). The findings of Mayes, Handford, Kowalski, and Schaefer (1988) suggest that positive changes in personality traits can occur over time, with parental acceptance associated with greater child self-confidence and less timidity.

As a group, adults with COPD have been described in terms of a general sense of failure, sadness and impending doom, ego weakness, dependency behavior, and obstreperousness; they seem to be more depressed, dissatisfied with life, lonely, tense, and anxious than their healthy counterparts (Sandhu, 1986; Williams, 1989). These characteristics call to mind issues involving trust, autonomy, and identity, although they may also reflect difficulties with the final developmental stage of integrity. Whether these characteristics are lifelong patterns, arise as a consequence of physiological distress, or are a methodological artifact is not known.

## THE MEPSI

The MEPSI was developed to subject Erikson's theory to empirical testing and address some of these issues. Briefly, Rosenthal, Gurney, and Moore's (1981) Erikson Psychosocial Stage Inventory (EPSI), which assesses the first six stages of life cycle development, was shortened and new scales were created to measure the final two stages. Content and face validity of these scales were addressed during their development, through careful content sampling, and a two-stage process of item evaluation by a panel of judges (Darling-Fisher & Leidy, 1988). The instrument was tested in a convenience sample of men and women ( $N = 168$ ) 19 to 86 years of age. This study found high levels of internal-consistency reliability in the MEPSI total ( $\alpha = .97$ ) and across subscales ( $\alpha = .75$  to  $.88$ ) and offered preliminary evidence of construct validity (Darling-Fisher & Leidy, 1988). In a later study of older adults, a high 2-week test-retest reliability level ( $r = .97$ ) was found (P. Winstead-Fry, personal communication, December 10, 1992).

The MEPSI is composed of 80 simple, theory-based statements, describing psychosocial attributes associated with each stage of development. Eight subscales (10 items each), corresponding to Erikson's eight stages of development, are imbedded in the measure. For example, "I have many regrets about what I might have become" and "I have difficulty relating to people different from me" are statements related to integrity and stagnation, respectively. For each statement, subjects are asked to respond to the question "How often is this true of you?" on a 5-point scale (*hardly ever true* to *almost always true*). The MEPSI total or aggregate mean score reflects the strength of attributes across stages and is designed to serve as a parsimonious summary statistic and screening device.

## METHOD

Data were extracted from four previous studies involving diverse samples: healthy young adults (Study 1), men with hemophilia (Study 2), healthy older adults (Study 3), and older adults with COPD (Study 4). All investigations employed a cross-sectional survey design. Studies 1, 2, and 4 used a mail survey methodology, following the recommendations of Dillman (1978). Study 3 involved structured personal interviews, with the MEPSI administered as an independently completed questionnaire. Each study included measurement of psychosocial attribute strength (MEPSI) and a theoretically related concept that could be used to assess the MEPSI's construct validity

**TABLE 1: Demographic Characteristics Across Studies**

Characteristic	Study			
	1	2	3	4
Health status	Healthy	Hemophilia	Healthy	COPD <sup>a</sup>
Sample size	450	134	100	109
Women	225	0	59	51
Men	225	134	41	58
Age (years)				
<i>M</i>	28.93	34.92	72.97	65.21
<i>SD</i>	4.88	13.76	7.77	8.46
Marital status (%)				
Married	96.8	59.2	57.0	76.6
Single/divorced	3.0	—	16.0	7.5
Widowed	0.2	—	27.0	15.9
Median income (\$)	30-40k	—	10-15k	15-20k
Education (%)				
High school	25.5	—	22.2	25.9
Some college	40.2	—	29.3	23.1
College graduate	13.1	—	14.1	8.3
Employment status (%) (outside the home)				
Full- or part-time	72.5	69.2	4.0	11.2
Retired	0	11.3	78.8	62.6

a. COPD = chronic obstructive pulmonary disease.

(Carmines & Zeller, 1979; Goodwin & Goodwin, 1991). Samples, measures, and procedures for each study are described below. Demographic characteristics for the four samples are shown in Table 1. Approval to conduct these studies was granted by the appropriate institutional review board.

## Study 1

### Sample

The first sample was composed of 450 healthy men and women (225 couples) with 8- to 9-month-old infants (Darling-Fisher, 1987). Men were significantly older than women ( $t = 6.20, p < .001$ ).

### Measures

In this investigation, it was hypothesized that the MEPSI would be positively related to an indicator of adaptation to parenthood (Erickson,

Tomlin, & Swain, 1983). Numerous studies have reported a relationship between self-concept, personality integration and ego differentiation, and the ability of people to adapt to parenthood (e.g., Curry, 1983; Heinicke, 1984; Mercer, 1986). The Post-Partum Self-Evaluation Questionnaire (PSQ) was used to measure the latter concept, with high scores indicating positive adaptation (Lederman, Weingarten, & Lederman, 1981). The PSQ has been used in a number of studies and has shown evidence of internal consistency (subscales alpha levels ranging from .61 to .90), as well as construct and convergent validity (Cronenwett, 1985; Kutzner, 1984; Lederman et al., 1981). The reliability level ( $\alpha$ ) for the PSQ in this study was .91.

### *Procedure*

Subjects were selected over a 3-month period from the weekly birth announcements of a large-city newspaper in the Midwest. Of the 618 people receiving questionnaire packets, 450 completed and returned them, a 73% response rate.

## **Study 2**

### *Sample*

Men ( $N = 134$ ) with hemophilia participated in this study (Walsh, 1988). Most (71%) had hemophilia A and half reported experiencing fewer than seven bleeding events during the previous year. Unfortunately, data concerning marital status (beyond a married/unmarried dichotomy), income, and education were not collected in this study.

### *Measures*

Because healthy psychosocial development is believed to facilitate social interaction and role performance, a significant relationship should exist between the MEPSI and an indicator of social adjustment, in this case the Social Adjustment Rating Scale Self-Report (SAS-SR) (Erickson et al., 1983; Richman, 1984). The SAS-SR assesses interpersonal relationships and role performance in six life areas, including work, home, social and leisure activities, and family relationships (Weissman & Bothwell, 1976). It has shown evidence of test-retest ( $r = .80$ ) and internal-consistency ( $\alpha = .74$ ) reliability, as well as construct and criterion-related validity (Richman, 1984; Weissman & Bothwell, 1976; Weissman, Prusoff, Thompson, Harding, &

Myers, 1978). For ease of interpretation, items were recoded so that higher scores indicate a higher degree of adjustment. The mean alpha across subscales in this study was .67.

#### *Procedure*

Questionnaires were sent to all (359) persons, 18 years of age and older, registered with a midwestern Hemophilia Foundation. Forty-three percent of the packets were returned, and 37% were suitable for analysis.

### **Study 3**

#### *Sample*

Study 3 involved 100 healthy older adults, with 76% describing their physical status as good to excellent.

#### *Measures*

A significant relationship between the MEPSI and an indicator of self-transcendence was hypothesized in this study. Considered a developmental resource of older adults, self-transcendence is defined as the capacity to extend beyond personal concerns and take on broader life perspectives, activities, and purpose without negating the value of the self (Reed, 1986, 1989). It may be seen as an outgrowth of healthy psychosocial development and, specifically, a corollary of integrity and wisdom, an active yet detached concern with a life now bounded by death (Erikson, 1982). In this study, self-transcendence was measured by the Self-Transcendence in Aging Scale or STAS (Reed, 1986). The STAS, a structured interview, has been used in several investigations, with internal-consistency estimates of .90 or above and indications of criterion-related and construct validity, including significant correlations with indicators of mental health (Langner Scale of Mental Health Symptomatology and the Center for Epidemiological Studies Depression Scale) (Reed, 1989, 1991). The alpha for the STAS in this sample was .68.

#### *Procedure*

Subjects were recruited through direct contact, from senior citizen communities in five economically diverse census tracts in a metropolitan area of the southwestern United States. Interviews were conducted in subjects' homes and community centers.

## Study 4

### *Sample*

The fourth study involved 109 older adults with COPD (Kline, 1988; Leidy, 1990). Over half of the subjects (56.0%) had had COPD for over 6 years. The sample had severe pulmonary disease, as indicated by a mean percentage of predicted forced expiratory volume (FEV) in 1 second (FEV<sub>1.0</sub>% predicted) of 43.3% ( $SD = 18.88$ ).

### *Measures*

The hypothesis of concern in this study was a significant relationship between the MEPSI and an indicator of basic-need satisfaction, an alliance proposed by Maslow (1970) and supported by others (Erickson et al., 1983; Goebel & Brown, 1981; Leidy et al., 1990; Omodei & Wearing, 1990). Need satisfaction was operationalized through the Basic Need Satisfaction Inventory (BNSI). An adaptation of the Andrews and Withey (1974) indicators of life concerns, the measure has shown evidence of reliability ( $\alpha = .92$ ), as well as content and construct validity (Kline, 1988; Leidy, 1994). In this sample, the alpha of the BNSI as a composite measure was .91.

### *Procedure*

Subjects were recruited from two pulmonary clinics and a rehabilitation program. Questionnaire packets were distributed by mail to 120 individuals who met the study criteria, with a response rate of 91%.

## Analyses

In each sample, Cronbach's formula for coefficient alpha was used to estimate the internal consistency of the eight subscales and MEPSI total for men and women. Construct validity was examined within and across samples. Pearson correlation coefficients were used to describe and test the relationship between the MEPSI and each of the four hypothetically related variables described above. Correlations were computed separately for women and men to see how the measure performed across gender. Analyses exploring the data for gender, age/cohort, and health effects were guided by the following literature- and theory-based working hypotheses:

1. Men and women in the same age cohort have equivalent MEPSI total and subscale scores. If gender differences exist, they are most likely to occur in



the Autonomy and Intimacy subscales, with men scoring higher on the former, women higher on the latter.

2. Younger and older healthy groups differ in MEPSI total and subscale scores.
3. The relationship between gender and MEPSI scores varies with age.
4. Chronically ill men and women have lower MEPSI subscale and total scores than their healthy counterparts.

The second hypothesis was considered with the full understanding that, because the data were cross-sectional, it would not be possible to determine the extent to which differences could be attributed to cohort, developmental, or combined effects, nor would it be possible to predict the direction of these differences. Theoretically, one might expect older adults to score higher on the MEPSI and its subscales because of maturation. However, generational differences may lead to findings in the opposite direction (e.g., higher Industry or Identity scores in younger subjects). In Hypothesis 3, the cross-sectional nature of the data precludes forecasting the origin or direction of gender differences across age cohorts. For example, dissimilarities in the socialization process may lead to differences in older adults, but not younger. On the other hand, differences between men and women may decrease with age, resulting in discrepancies between men and women in the younger samples but comparable scores in the older. Finally, Hypothesis 4 is based on the premise that chronically ill individuals have fewer psychosocial strengths from the onset of their illness or as a result of continued stressors that may sap these strengths.

To test these hypotheses, two analyses of variance (ANOVAs) and two multivariate ANOVA tests (MANOVAs) were performed. The first ANOVA (two-way) was used to evaluate interactive, gender, age/cohort, and health effects on the MEPSI total score, for subjects from Studies 1, 3, and 4 ( $N = 632$ ). MANOVA was used to evaluate these differences on the eight subscales simultaneously. Because Study 2 involved men only, the second ANOVA and MANOVA analyses included data for men from all four studies ( $N = 440$ ) and tested for health effects only.

Significant ANOVAs were followed by Scheffé multiple comparison tests ( $p < .05$ ). When MANOVA omnibus test statistics were found to be significant, discriminant analyses with canonical variate correlations and univariate  $F$  tests ( $p < .006$  according to the stringent Bonferroni procedure) were performed to determine the nature and location of group differences (Bray & Maxwell, 1985). Once subscales responsible for group differences were identified, Scheffé ANOVA comparisons ( $p < .05$ ) and, in the case of gender,  $t$  tests ( $p < .05$ ) were used to explore these differences further (Bird & Hadzi-Pavlovic, 1983; Bray & Maxwell, 1985).

**TABLE 2: Subscale and Total Scale Internal-Consistency ( $\alpha$ ) Estimates by Study and Gender**

Scale	Study and Gender							
	1 (Healthy)		2 (Hemophilia)		3 (Healthy)		4 (COPD) <sup>a</sup>	
	Women	Men	Men	Women	Men	Women	Men	
Trust	.83	.81	.83	.69	.63	.77	.73	
Autonomy	.79	.72	.80	.68	.68	.67	.84	
Initiative	.73	.70	.77	.68	.76	.48	.79	
Industry	.86	.79	.84	.82	.74	.63	.85	
Identity	.86	.79	.86	.78	.59	.72	.80	
Intimacy	.74	.73	.75	.57	.61	.69	.74	
Generativity	.63	.64	.77	.54	.61	.59	.72	
Integrity	.76	.72	.79	.60	.46	.67	.65	
MEPSI <sup>b</sup> total	.96	.95	.97	.94	.93	.93	.96	

a. COPD = chronic obstructive pulmonary disease.

b. MEPSI = Modified Erikson Psychosocial Stage Inventory.

## RESULTS

### Reliability

Alpha internal-consistency coefficients for the subscales and total scales in each sample are provided in Table 2. Total score reliability levels were high for men and women, averaging .95 across the four samples. For women, the Identity subscale had the highest ( $\alpha = .79$ ) average reliability estimate, whereas the Generativity subscale had the lowest ( $\alpha = .59$ ). For men, the subscale with the highest average reliability was Industry ( $\alpha = .81$ ) and the lowest was Integrity ( $\alpha = .66$ ).

### Validity

As predicted, the MEPSI total correlated significantly with indicators of adaptation to parenthood, social adjustment, self-transcendence, and need satisfaction (see Table 3). In Studies 1 and 2, all of the subscale-variable coefficients were significant for both men and women. Only seven of the coefficients in Studies 3 and 4 were not significant, in part a function of power, although all were in the expected direction.

Exploring group differences on the MEPSI total, no interactive or gender effects were found in the two-way ANOVA. This provided support for

**TABLE 3: Pearson Correlation Coefficients Between Relevant Variables and MEPSI<sup>a</sup> Subscales and Total Scale by Study and Gender**

Scale	Study, Related Construct, and Gender						
	1 (Adaptation to Parenthood)		2 (Social Adjustment)	3 (Self-Transcendence)		4 (Need Satisfaction)	
	Women (n = 205)	Men (n = 196)	Men (n = 134)	Women (n = 59)	Men (n = 41)	Women (n = 49)	Men (n = 57)
Trust	.49**	.43**	.58**	.32*	.14	.50**	.34**
Autonomy	.47**	.40**	.57**	.45**	.46*	.44**	.37**
Initiative	.36**	.45**	.46**	.33*	.45*	.29*	.23
Industry	.37**	.40**	.49**	.29	.54**	.50**	.42**
Identity	.53**	.43**	.62**	.40**	.64**	.50**	.48**
Intimacy	.47**	.34**	.61**	.49**	.27	.41**	.17
Generativity	.42**	.49**	.52**	.47**	.48**	.48**	.54**
Integrity	.52**	.41**	.54**	.29	.40	.53**	.55**
MEPSI <sup>a</sup> total	.56**	.52**	.65**	.48**	.54**	.60**	.46**

a. MEPSI = Modified Erikson Psychosocial Stage Inventory.

\* $p < .05$ ; \*\* $p < .01$ .

Hypothesis 1 but not for Hypothesis 3. The health effect was significant,  $F(2, 627) = 20.18, p < .001$ , with the COPD sample (Study 4) scoring significantly lower on the MEPSI total than the older (Study 3) healthy group. This provided support for Hypothesis 4 in COPD subjects. However, the hypothesis was not supported in the hemophilic group. Although the second one-way ANOVA was significant,  $F(3, 440) = 5.23, p < .01$ , the finding was due to the lower scores for men with COPD (Study 4) compared with young, healthy men (Study 1). Sample means and standard deviations are included in Table 4.

Testing differences on the eight subscales for Groups 1, 3, and 4, the first MANOVA revealed a significant interaction effect: Wilks's lambda ( $\lambda$ ) = .96,  $F(16, 1238) = 1.69, p < .05$ ; Pillai-Bartlett trace = .04,  $F(16, 1240) = 1.69, p < .05$ ;  $\hat{\eta}_{\text{mult}}^2 = .02$ . The effect size was very small, however, and discriminant function and univariate analyses indicated no significant subscale differences. Both genders, Wilks's  $\lambda = .92, F(8, 619) = 6.88, p < .001$ ; Pillai-Bartlett trace = .08,  $F(8, 619) = 6.88, p < .001$ ;  $\hat{\eta}_{\text{mult}}^2 = .08$ , and health effects, Wilks's  $\lambda = .78, F(16, 1238) = 10.32, p < .001$ ; Pillai-Bartlett trace = .23,  $F(16, 1240) = 9.90, p < .001$ ;  $\hat{\eta}_{\text{mult}}^2 = .11$ , were significant.

Univariate analyses detected gender differences in the Autonomy and Intimacy subscales only, consistent with the first working hypothesis. Applying the Bonferroni criterion, significant differences were found in the young healthy group (Study 1) only, with women scoring lower on Autonomy,  $t(413) = 4.66, p < .001$ , and higher on Intimacy,  $t(426) = -6.88, p < .001$ , than men.

**TABLE 4: Scale Means and Standard Deviations by Study and Gender**

Scale	Study 1		Study 2		Study 3		Study 4	
	Women (n = 214)		Men (n = 134)		Women (n = 59)		Men (n = 41)	
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Trust	4.02 (.62)	3.91 (.59)	3.75 (.68)	4.03 (.48)	3.76 (.51)	3.73 (.61)	3.76 (.56)	
Autonomy	4.00 (.52)	4.21 (.43)	4.12 (.58)	3.99 (.47)	3.99 (.51)	3.69 (.50)	3.92 (.60)	
Initiative	4.03 (.51)	4.13 (.47)	4.04 (.57)	4.00 (.49)	3.88 (.59)	3.61 (.47)	3.75 (.63)	
Industry	4.16 (.56)	4.24 (.51)	4.12 (.61)	3.88 (.62)	3.90 (.58)	3.69 (.53)	3.77 (.72)	
Identity	4.11 (.63)	4.17 (.54)	4.05 (.69)	4.14 (.53)	4.02 (.49)	3.72 (.54)	3.92 (.61)	
Intimacy	4.03 (.56)	3.65 (.59)	3.60 (.67)	3.70 (.53)	3.45 (.53)	3.47 (.61)	3.45 (.64)	
Generativity	3.91 (.48)	3.87 (.49)	3.71 (.68)	3.97 (.45)	3.87 (.52)	3.83 (.50)	3.83 (.59)	
Integrity	4.02 (.60)	3.97 (.54)	3.82 (.70)	4.03 (.46)	3.95 (.45)	3.72 (.58)	3.89 (.55)	
MEPSI <sup>a</sup> Total	4.03 (.45)	4.02 (.41)	3.90 (.55)	3.97 (.40)	3.85 (.41)	3.68 (.41)	3.78 (.51)	

a. MEPSI = Modified Erikson Psychosocial Stage Inventory.

Multivariate analyses and univariate  $F$  tests indicated group differences in MEPSI scores across all subscales but Generativity. Scheffé comparisons revealed the following: Addressing Hypothesis 2, younger healthy women (Study 1) had higher scores than the older healthy women (Study 3) on Industry and Intimacy, whereas younger healthy men (Study 1) had higher scores on Industry than the older healthy men (Study 3). Addressing Hypothesis 4, older women with COPD (Study 4) had significantly lower scores than older healthy women (Study 3) on Trust, Autonomy, Initiative, Identity, and Ego Integrity. In contrast, older men with COPD (Study 1) did not differ from the older healthy men (Study 3).

Testing differences across subscales for men in all four groups, the second MANOVA, the group effect was again significant: Wilks's  $\lambda = .82$ ,  $F(24, 1256) = 3.75$ ,  $p < .001$ ; Pillai-Bartlett trace = .19,  $F(24, 1305) = 3.59$ ,  $p < .001$ ;  $\hat{\eta}_{\text{mult}}^2 = .06$ . Contrary to the fourth hypothesis, Scheffé comparisons showed that hemophiliacs (Study 2) did not differ from young healthy men (Study 1). Rather, the significance was attributable to differences between hemophiliacs and COPD men on Initiative and Industry.

## DISCUSSION

The reliability of the measure in assessing the *overall* strength of developmental attributes was supported in each of the four samples. Internal-consistency estimates for the total scale were consistently high, and alpha levels in the younger groups met the standard of .95 for use in applied settings (Nunnally, 1978). Subscale reliability levels for younger men and women exceeded Nunnally's criterion of .70 for immature scales, with the exception of Generativity. The same held true for older men with COPD, with the exception of Integrity. In contrast, a number of coefficients in the studies involving women with COPD and older healthy adults fell below the criterion.

There are several explanations and implications for the differences in subscale reliability levels. First, and most apparent, although the total scale may be a reliable measure of overall developmental attribute strength, further study, modification, or both may be needed to reliably assess specific strengths in older adults. Second, these findings may be a function of gender bias, a generational cohort effect, or both. That is, if Erikson's theory elucidates traditional male psychosocial development, one would expect the MEPSI to perform more reliably in men. This held true for the young healthy men and for the men in the COPD group but not the healthy older men. In terms of a cohort effect, if Western society is leaning more toward develop-

mental androgyny, the MEPSI would be expected to be equally reliable in younger men and women. This was, in fact, the case.

There is a third explanation for the relatively depressed reliability levels in selected subscales. In three samples, the lowest alpha coefficients were found in subscales associated with developmental issues of primary concern for that age group. Coefficients for Generativity were lowest in the young adults, whereas Generativity and Integrity were lowest in the two samples of older adults. Recall that at each stage in life, individuals search for a solution to that "crisis," attempting to master new tasks and attain a successful resolution to the conflict (Erikson, 1982). This implies stage-related uncertainty and instability. Thus response inconsistency in companion subscales (e.g., Identity during adolescence, Generativity during young adulthood, and Integrity in old age) is not only understandable; it is predictable. In fact, although counterintuitive from a psychometric perspective, greater response instability (i.e., lower reliability levels) in the subscale of developmental ascendancy, for a given age group, may actually offer evidence of the construct validity of that subscale, for use with other age groups. This perspective also creates a dilemma, however, making it difficult, if not impossible (and illogical), to assess stage-specific attributes during their developmental ascendancy.

Construct validation "requires a pattern of consistent findings involving different researchers using different theoretical structures across a number of different studies" (Carmines & Zeller, 1979, p. 24). In each of the four studies described here, significant relationships were found between the MEPSI total and subscale scores and hypothetically related variables: adaptation to parenthood, social adjustment, need satisfaction, and, for the most part, self-transcendence. Self-transcendence was not a significant correlate of Trust, Intimacy, or Integrity for men, nor of Industry and Integrity for women. The apparent independence among these variables may be due, in part, to the relatively low reliability of the STAS in this sample (study 3). When the findings are taken as a whole, however, evidence of the MEPSI's validity seems to be emerging.

The four exploratory analyses provided some support for the construct validity of the MEPSI but also raised important methodological and theoretical issues. As suggested in Hypothesis 1, no gender effects were found for the MEPSI total. Differences were found in the Autonomy and Intimacy subscales in the young, healthy sample, however. This finding is consistent with Gilligan's (1982) suggestion that women are more oriented toward attachment, whereas male development emphasizes autonomy. It is also congruous with the higher intimacy scores for college women found by Schiedel and Marcia (1985). Differences in the younger sample are in

agreement with the hypothesis that gender differences are greatest, and fear of femininity, expressed through restricted intimacy and exaggerated autonomy, is strongest in young adulthood (Dacey, 1982; O'Neil, Helms, Gable, David, & Wrightsman, 1986). The fact that no attribute differences were found between older men and women is congruent with the proposition that gender differences converge in old age as men and women take on similar life roles (e.g., Gutmann, 1985; Neugarten, 1968).

In contrast to expectations described in Hypothesis 2, no difference in MEPSI total score was found between younger and older groups. Differences between age groups were noted on specific subscales. Unfortunately, because of the cross-sectional nature of these studies, it is not possible to determine whether these differences were due to developmental effects, cohort effects, or both. Studies employing a developmental model or cohort-sequential method are needed to isolate these confounding factors (Baltes, 1987; Kosloski, 1986; Schaie, 1965). Analyses related to age-group differences in this study should be considered an *exploratory* effort to gain psychometric and theoretical insight.

With this important caveat in mind, young, healthy women scored higher on Intimacy than did older healthy women. This is consistent with Ryff and Migdal's (1984) report that intimacy is more salient in younger women. Younger men scored higher on Industry than did their healthy older counterparts, in agreement with previous findings that younger men have higher levels of achievement, dominance, and social recognition than older men (Neugarten, 1964; Ryff, 1982). Healthy young women also scored higher on Industry than did their older counterparts. These findings are in contrast with Erikson et al. (1986), however, who describe a renewed sense of competence with aging, as retirees are challenged to "transcend (the) inevitable sources of inferiority" (p. 148) resulting from separation from work and development of latent interests and new opportunities for industry. There are several possible explanations. First, the MEPSI may not be sensitive to the expression of industry and inferiority in older samples. Second, the individuals in this sample (study 3) may not be successful in pursuing alternative means of competence in old age. Finally, there may be cohort differences in the achievement, expression, or salience of industry and competence, as suggested by Neugarten (1964) and Ryff (1982). Only further study can resolve this question.

Assessment of construct validity by comparing attribute strength across physical health state (Hypothesis 4) was partially supported. MEPSI total scores were sensitive to differences in psychosocial attribute strength between healthy and COPD subjects, but not between hemophilic and healthy men. The latter finding may denote insensitivity on the part of the MEPSI. On the other hand, if the MEPSI is a valid measure, the finding could indicate

either a sampling bias (i.e., the sample had unusually strong attributes, quite possible given the response rate in this study), or that, on average, hemophilia does not preclude healthy psychosocial development. The latter explanation is consistent with Mayes et al.'s (1988) description of positive personality change over time. Unfortunately, few studies have described psychosocial attributes of hemophilic adults.

Women with COPD had lower mean scores than healthy older women on all subscales, with significant differences on the total scale, and on five of the eight subscales. Although the scores of men with COPD were also lower than those of the healthy older men on six subscales and total score, the differences were not significant under the conservative methods employed here. These findings indicate that the instrument is fairly sensitive to health effects in women with COPD, but not in men. Given the belief held by some that Erikson's theory is gender biased, one might have expected that, if anything, the MEPSI would be more sensitive to group differences in men. This finding may censure the MEPSI. Assuming the theory is unbiased and the MEPSI is valid, however, several interesting and important implications emerge. Men and women with COPD did not differ in psychosocial attribute strength. Women with COPD had significantly lower levels of attribute strength than healthy older women, however. These findings suggest that women with COPD may be having trouble reaching or maintaining their psychosocial potential, presumably as a consequence of their disease, and may be particularly vulnerable to the adverse effects of illness. Furthermore, insight into the attributes of women and men with a chronic illness are best attained, not by contrasting them with one another, but by comparing them with their healthy counterparts.

The findings reported here indicate that the MEPSI may be a reliable and valid instrument; however, additional study of the psychometric properties of the MEPSI is clearly needed. First and foremost, the MEPSI should be validated through a triangulation method, evaluating the measure against the clinical impressions of Eriksonian practitioners, structured interview, and other more complex survey measures of psychosocial development. Confirmatory factor analysis in a large sample of healthy adults should be performed to test the factor structure of the instrument. In addition, the MEPSI needs to be evaluated in healthy middle-aged adults, particularly in light of the large quantity of theoretical work and paucity of empirical validation in this group (Farrell & Rosenberg, 1981). Finally, the measure's performance in different ethnic and cultural groups and across various time periods should be assessed. Test-retest reliability is important and should be examined across gender and age groups.



## CONCLUSION

Findings from this secondary analysis indicate that the MEPSI is relatively stable across diverse populations. Internal-consistency levels for the aggregate scale were high in these samples, and subscale reliabilities in young adults generally exceeded Nunnally's criteria for immature scales. Modest subscale reliability in older adults suggests the need for further study in this group. Evidence of construct validity was found within each of the four samples. Exploratory analyses detected attribute differences across gender and between age cohorts, although additional studies are clearly needed. Finally, the MEPSI was able to detect several areas in which adults with COPD may have fewer psychosocial resources than their healthy counterparts.

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## REFERENCES

- Andrews, F., & Withey, S. (1974). Developing measures of perceived life quality: Results from several national surveys. *Social Indicators Research, 1*, 1-26.
- Baltes, P. (1987). Theoretical propositions of life-span developmental psychology: On the dynamics between growth and decline. *Developmental Psychology, 23*, 611-626.
- Baltes, P., Reese, H., & Lipsitt, L. (1980). Life-span developmental psychology. *Annual Review of Psychology, 31*, 65-110.
- Bird, K., & Hadzi-Pavlovic, D. (1983). Simultaneous test procedures and the choice of a test statistic in MANOVA. *Psychological Bulletin, 93*, 167-178.
- Bray, J., & Maxwell, S. (1985). *Multivariate analysis of variance*. Beverly Hills, CA: Sage.
- Carmines, E., & Zeller, R. (1979). *Reliability and validity assessment*. Beverly Hills, CA: Sage.

- Constantinople, A. (1969). An Eriksonian measure of personality development in college students. *Developmental Psychology, 1*, 357-372.
- Cronenwett, L. (1985). Network structure, social support, and psychological outcomes of pregnancy. *Nursing Research, 34*, 225-239.
- Curry, M. (1983). Variables related to adaptation to motherhood in "normal" primiparous women. *JOGN Nursing, 12*, 115-121.
- Dacey, J. (1982). *Adult development*. Glenview, IL: Scott Foresman.
- Darling-Fisher, C. (1987). The relationship between mothers' and fathers' Eriksonian psychosocial attributes, perceptions of family support, and adaptation to parenthood (Doctoral dissertation, University of Michigan, 1987). *Dissertation Abstracts International, 48*, 1640B.
- Darling-Fisher, C., & Leidy, N. K. (1988). Measuring Eriksonian development in the adult: The Modified Erikson Psychosocial Stage Inventory. *Psychological Reports, 62*, 747-754.
- Deaux, K. (1985). Sex and gender. *Annual Review of Psychology, 36*, 49-81.
- Dillman, D. (1978). *Mail and telephone surveys*. New York: Wiley.
- Domino, G., & Affonso, D. (1990). A personality measure of Erikson's life stages: The Inventory of Psychosocial Balance. *Journal of Personality Assessment, 54*, 576-588.
- Eaton, Y., Mitchell, M., & Jolley, J. (1991). Gender differences in the development of relationships during late adolescence. *Adolescence, 26*, 565-568.
- Erickson, H., Tomlin, E., & Swain, M. A. (1983). *Modeling and role-modeling: A theory and paradigm for nursing*. New Jersey: Prentice-Hall.
- Erikson, E. (1963). *Childhood and society* (Rev. ed.). New York: Norton.
- Erikson, E. (1982). *The life cycle completed*. New York: Norton.
- Erikson, E., Erikson, J., & Kivnick, H. (1986). *Vital involvement in old age*. New York: Norton.
- Farrell, M., & Rosenberg, S. (1981). *Men at midlife*. Boston: Auburn House.
- Gilligan, C. (1982). *In a different voice: Psychological theory and women's development*. Cambridge, MA: Harvard University.
- Goebel, B., & Brown, D. (1981). Age differences in motivation related to Maslow's need hierarchy. *Developmental Psychology, 17*, 809-815.
- Goodwin, L., & Goodwin, W. (1991). Estimating construct validity. *Research in Nursing and Health, 14*, 235-243.
- Gruen, W. (1964). Adult personality: An empirical study of Erikson's theory of ego development. In B. L. Neugarten (Ed.), *Personality in middle and late life: Empirical studies* (pp. 12-14). New York: Atherton.
- Gurney, R. (1980). The effects of unemployment on the psychosocial development of school-leavers. *Journal of Occupational Psychology, 5*, 205-213.
- Gutmann, D. (1985). The parental imperative revisited: Towards a developmental psychology of adulthood and later life. *Contributions in Human Development, 14*, 31-60.
- Handford, H., Mayes, S., Bagnato, S., & Bixler, E. (1986). Relationships between variations in parents' attitudes and personality traits of hemophilic boys. *American Journal of Orthopsychiatry, 56*, 424-434.
- Heinicke, C. (1984). Impact of prebirth parent personality and marital functioning on family development: A framework and suggestions for further study. *Developmental Psychology, 20*, 1044-1053.
- Hodgson, J., & Fischer, J. (1979). Sex differences in identity and intimacy development in college youth. *Journal of Youth and Adolescence, 8*, 37-50.
- Kline, N. (1988). Psychophysiological processes of stress in people with a chronic physical illness (Doctoral dissertation, University of Michigan, 1988). *Dissertation Abstracts International, 49*, 2129B.
- Kosloski, K. (1986). Isolating age, period, and cohort effects in developmental research: A critical review. *Research on Aging, 8*, 460-479.

- Kutzner, S. (1984). Adaptation to motherhood from postpartum to early childhood (Doctoral dissertation, University of Michigan, 1984). *Dissertation Abstracts International*, 45, 2104B.
- Kvist, B., Kvist, M., & Rajantie, J. (1990). School absences, school achievements and personality traits of the hemophilic child. *Scandinavian Journal of Social Medicine*, 18, 125-132.
- Lederman, R., Weingarten, C., & Lederman, E. (1981). Postpartum self-evaluation questionnaire: Measures of maternal adaptation. In R. Lederman, B. Raff, & P. Carroll (Eds.), *Perinatal parental behavior: Nursing research and implications for newborn health* (pp. 201-231). New York: Alan Liss.
- Leidy, N. K. (1990). A structural model of stress, psychosocial resources, and symptomatic experience in chronic physical illness. *Nursing Research*, 39, 230-236.
- Leidy, N. K. (1994). Operationalizing Maslow's theory: Development and testing of the Basic Need Satisfaction Inventory. *Issues in Mental Health Nursing*, 15, 277-295.
- Leidy, N. K., Ozbolt, J., & Swain, M. A. (1990). Psychophysiological processes of stress in chronic physical illness: A theoretical perspective. *Journal of Advanced Nursing*, 15, 478-486.
- Maslow, A. (1970). *Motivation and personality* (2nd ed.). New York: Harper & Row.
- Mayes, S., Handford, H., Kowalski, C., & Schaefer, J. (1988). Parent attitudes and child personality traits in hemophilia: A six-year longitudinal study. *International Journal of Psychiatry in Medicine*, 18, 339-355.
- Meijer, A. (1980-1981). Psychiatric problems of hemophilic boys and their families. *International Journal of Psychiatry in Medicine*, 10, 163-172.
- Mercer, R. (1986). The relationship of developmental variables to maternal behavior. *Research in Nursing and Health*, 9, 25-33.
- Miller, J. (1976). *Toward a new psychology of women*. Boston: Beacon.
- Neugarten, B. (Ed.). (1964). *Personality in middle and late life*. New York: Atherton.
- Neugarten, B. (1968). The awareness of middle age. In B. L. Neugarten (Ed.), *Middle age and aging* (pp. 93-98). Chicago: University of Chicago Press.
- Nunnally, J. (1978). *Psychometric theory*. New York: McGraw-Hill.
- Ochse, R., & Plug, C. (1986). Cross-cultural investigation of the validity of Erikson's theory of personality development. *Journal of Personality and Social Psychology*, 50, 1240-1252.
- Omodei, M., & Wearing, A. (1990). Need satisfaction and involvement in personal projects: Toward an integrative model of subjective well-being. *Journal of Personality and Social Psychology*, 59, 762-769.
- O'Neil, J., Helms, B., Gable, R., David, L., & Wrightsman, L. (1986). Gender-role conflict scale: College men's fear of femininity. *Sex Roles*, 14, 335-350.
- Peck, T. (1986). Women's self-definition in adulthood: From a different model? *Psychology of Women Quarterly*, 10, 274-284.
- Reed, P. (1986). Developmental resources and depression in the elderly. *Nursing Research*, 35, 368-374.
- Reed, P. (1989). Mental health of older adults. *Western Journal of Nursing Research*, 11, 143-163.
- Reed, P. (1991). Self-transcendence and mental health in oldest-old adults. *Nursing Research*, 40, 5-11.
- Richman, J. (1984). Sex differences in social adjustment: Effects of sex role socialization and role stress. *Journal of Mental Disease*, 172(9), 539-545.
- Rosenthal, D., Gurney, R., & Moore, S. (1981). From trust to intimacy: A new inventory for examining Erikson's stages of psychosocial development. *Journal of Youth and Adolescence*, 10, 525-537.
- Ryff, C. (1982). Self-perceived personality change in adulthood and aging. *Journal of Personality and Social Psychology*, 42, 108-115.
- Ryff, C., & Migdal, S. (1984). Intimacy and generativity: Self-perceived transitions. *Signs*, 9, 470-481.

- Sandhu, H. (1986). Psychosocial issues in chronic obstructive pulmonary disease. *Clinics in Chest Medicine*, 7, 629-642.
- Schaie, K. (1965). A general model for the study of developmental problems. *Psychological Bulletin*, 64, 92-107.
- Schiedel, D., & Marcia, J. (1985). Ego identity, intimacy, sex role orientation, and gender. *Developmental Psychology*, 21, 149-160.
- Tesch, S., & Whitbourne, S. (1982). Identity and intimacy status in young adults. *Journal of Personality and Social Psychology*, 43, 1041-1051.
- Viney, L. (1987). A sociophenomenological approach to life-span development complementing Erikson's sociodynamic approach. *Human Development*, 30, 125-136.
- Wagner, K., Lorion, R., & Shipley, T. (1983). Insomnia and psychosocial crisis: Two studies of Erikson's developmental theory. *Journal of Consulting and Clinical Psychology*, 51, 595-603.
- Walaskay, M., Whitbourne, S., & Nehrke, M. (1983-1984). Construction and validation of an ego identity status interview. *International Journal of Aging and Human Development*, 18, 61-72.
- Walsh, K. (1988). *An investigation of psychosocial attributes in adult males with hemophilia*. Unpublished master's thesis, University of Michigan, Ann Arbor.
- Waterman, A., & Whitbourne, S. (1982). Androgyny and psychosocial development among college students and adults. *Journal of Personality*, 50, 121-133.
- Weissman, M. M., & Bothwell, S. (1976). Assessment of social adjustment by patient self-report. *Archives of General Psychiatry*, 33, 1111-1115.
- Weissman, M., Prusoff, B., Thompson, W., Harding, P., & Myers, J. (1978). Social adjustment by self-report in a community sample and in psychiatric outpatients. *Journal of Nervous and Mental Disease*, 166(5), 317-326.
- Whitbourne, S., Jelsma, B., & Waterman, A. (1982). An Eriksonian measure of personality development in college students: A reexamination of Constantinople's data and a partial replication. *Developmental Psychology*, 18, 369-371.
- Whitbourne, S., & Waterman, A. (1979). Psychosocial development during the adult years: Age and cohort comparisons. *Developmental Psychology*, 15, 373-378.
- Whitbourne, S., Zuschlag, M., Elliot, L., & Waterman, A. (1992). Psychosocial development in adulthood: A 22-year sequential study. *Journal of Personality and Social Psychology*, 63, 260-271.
- Wilkie, P., Markova, I., Naji, S., & Forbes, C. (1990). Daily living problems of people with hemophilia and HIV infection: Implications for counselling. *International Journal of Rehabilitation Research*, 13, 15-25.
- Williams, S. (1989). Chronic respiratory illness and disability: A critical review of the psychosocial literature. *Social Science in Medicine*, 28, 791-803.