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THE PREDICTION OF EGO INTEGRITY IN OLDER PERSONS

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This study examined the extent to which the resolution of the Eriksonian final stage-related crisis of ego integrity versus despair is predicted by the resolution of earlier stage-related crises and by non-Eriksonian personality constructs. Subjects were administered an Eriksonian life stage measure called the Inventory of Psychosocial Balance, the Rosenberg Self-Esteem Scale, the Purpose-in-Life Scale, and the Self-Realization Scale. A series of alternative and hierarchically nested regression models was run to assess the direct effects of all preceding Eriksonian life stages and the non-Eriksonian personality measures on the final stage of ego integrity. The results were consistent with Eriksonian theory, which states that personality development is a continuous process in which psychosocial growth during earlier phases of life is a prerequisite for the resolution of later developmental conflicts.

During the past several decades, there has been a great deal of interest in the measurement of satisfactory adjustment to the aging process. Now, with more people in the United States over the age of 65 than there are people in

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all of Canada, as Birren (1983) pointed out, psychologists have good reason
to attend to the psychological and psychosocial issues affecting the quality
of life of the older population.

Some constructs have been proposed as key indicators of the feelings and
attitudes of older persons, including adjustment to various life domains
(Cavan, Burgess, Havighurst, & Goldhammer, 1949), life satisfaction
(Neugarten, Havighurst, & Tobin, 1961; Spreitzer & Snyder, 1974), affect
balance (Bradburn, 1969), life goals (Buhler, Brind, & Horner, 1968), hap-
piness (Havighurst & Albrecht, 1953; Stones & Kozma, 1980), competence
(Domino & Hannah, 1989), morale (Kutner, Fanshel, Toto, & Langner, 1956;
Lawton, 1975), subjective or psychological well-being (Bradburn, 1969;
George, 1981; Lawton, 1983; Lawton, Kleban, & diCarlo, 1984; Ryff,
1989b), and successful aging (Ryff, 1989a).

As Ryff (1989b) points out, much of this literature lacks theoretical
grounding, and therefore ignores important aspects of positive functioning.
Even those formulations that are theoretically rooted have suffered from a
lack of valid assessment scores. Thus reviews of measures of personality
adjustment in older persons have argued both for more rigorous theoretical
applications (Sauer & Warland, 1982) and the need for greater conceptual
clarity. Given that the myriad of concepts related to adjustment are often used
interchangeably (Horley, 1984), the most compelling need may be to examine
the convergent and discriminant validity of scores on such constructs.

A related issue concerns the multidimensionality versus unidimension-
ality of the concept of adjustment. Horley (1984), for example, considered life
satisfaction, happiness, and morale as distinct dimensions that contribute to
the higher order dimension of well-being. Ryff (1989a), in fact, emphasized
the necessity of multidimensional approaches to the measurement of success-
ful aging. Larson (1978), on the other hand, points out that because the
constructs associated with the concept of subjective well-being are highly
intercorrelated, they seem to be measuring a single positive-negative contin-
uum. Likewise, Stones and Kozma (1980) considered a sole dimension,
happiness, to be the most appropriate mental health construct used by
gerontologists, although happiness has also been considered the outcome of
two separate and independent dimensions: positive and negative affect (Ryff,
1989b).

Eriksonian Constructs and Adjustment to Aging

Erik Erikson's (1963) life-span developmental theory offers an enticing
scheme for the exploration of satisfactory adjustment to the aging process.
Erikson views ego development as spanning the entire life cycle, which is
composed of a hierarchically ordered sequence of stages. Accompanying
each of these stages is a psychosocial "crisis" or turning point that arises from
the combination of physiological maturation and psychosocial demands that are encountered by the person during a given stage. The manner in which these crises are eventually resolved has subsequent personological impact: the positive or adaptive resolution of a given conflict (e.g., basic trust vs. mistrust) contributes to the strengthening of the ego and raises the probability that the crisis associated with the next stage (e.g., autonomy vs. shame and doubt) will also be positively resolved (Erikson, 1963). Table 1 displays the eight Eriksonian stages, along with their accompanying psychosocial crises and age spans.

Erikson’s epigenetic theory of development is characterized by a process of equilibration in which the psychosocial balance shifts from one state of disequilibrium to the next (Clayton, 1975). Each stage has its specific conflict, but these themes are also interspersed throughout preceding and subsequent stages. Thus the conflict of trust versus mistrust occurs not just in the oral sensory period of development but throughout life, and remains a central dynamic issue.

Because of the sequential interdependence of the stages, the emergence of positive characteristics associated with earlier life stages is a prerequisite to the successful encounter with future stage-related developmental conflicts, including the encounter related to the final life stage of ego integrity versus despair. Coles (1970) describes the eighth stage as the maturity stage in which the individual “either does or does not find at least a degree of purpose and coherence in his life—hence, in all life” (p. 135). Erikson views ego integrity as the “fruit of the seven stages,” which culminates in a sense of order and of meaning (1963, p. 268). Pointing out Webster’s definition of trust as the “assured reliance on another’s integrity” (p. 269), Erikson sees integrity as linked with trust, the cornerstone of the healthy personality, in a cross-generational sense. That is, consistent with Erikson’s notion of mutuality, trust hinges upon the integrity of a caretaker from a previous generation. Thus integrity may be considered as both the healthy culmination of intraindividual personality development and as a reflection of the mutual interdependence between generations and among all members of one’s culture.

**Empirical Studies of the Eriksonian Constructs**

A great deal of empirical work has been generated by Erikson’s theory, and some attempts have been made to operationalize the stages and measure the resolution of stage-related crises. Most of the work has explored the application of the theory to younger persons. In fact, many of the scales developed to measure Eriksonian stages assess only a single stage; examples of these include the Ego Identity Scale developed by Tan, Kendis, Fine, and Porac (1977), the Identity Status Interview developed by Marcia (1966), and an ego integrity scale devised by Goebel and Boeck (1987). Other measures
Table 1
Eriksonian Developmental Stages and Stage-Related Crises

<table>
<thead>
<tr>
<th>Life Phase</th>
<th>Accompanying Crisis</th>
<th>Approximate Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infancy</td>
<td>Basic trust vs. mistrust</td>
<td>Birth-1 year</td>
</tr>
<tr>
<td>Early childhood</td>
<td>Autonomy vs. shame and doubt</td>
<td>1-3 years</td>
</tr>
<tr>
<td>Preschool age</td>
<td>Industry vs. inferiority</td>
<td>4-5 years</td>
</tr>
<tr>
<td>School age</td>
<td>Initiative vs. guilt</td>
<td>6-11 years</td>
</tr>
<tr>
<td>Adolescence</td>
<td>Identity vs. role confusion</td>
<td>12-20 years</td>
</tr>
<tr>
<td>Early adulthood</td>
<td>Intimacy vs. isolation</td>
<td>21-24 years</td>
</tr>
<tr>
<td>Adulthood</td>
<td>Generativity vs. stagnation</td>
<td>25-64 years</td>
</tr>
<tr>
<td>Late adulthood</td>
<td>Ego integrity vs. despair</td>
<td>65-death</td>
</tr>
</tbody>
</table>

(e.g., those of Constantinople [1969], Darling-Fisher & Leidy [1988], and Rosenthal, Gurney, & Moore [1981]) include scales for only the first six stages. In particular, the identity stage, which accompanies adolescence, has been the focus of intense theoretical and empirical attention (e.g., Constantinople, 1969; Erikson, 1968; Marcia, 1966), as has been the generativity stage associated with middle adulthood (e.g., McAdams & de St. Aubin, 1992; McAdams, de St. Aubin, & Logan, 1993; Peterson & Stewart, 1990; Van de Water & McAdams, 1989). Thus, as McAdams (1994) pointed out, the ego integrity versus despair crisis is perhaps the least examined of Eriksonian life stages.

Clearly, greater empirical attention has been paid to the earlier stages, but several studies have examined the extent to which elderly persons do indeed confront the final psychosocial crisis hypothesized by Erikson. The focus of some of these authors has been to operationalize ego integrity, whereas others have attempted to establish construct validity by examining the correlates of ego integrity.

In one of the earlier applications of Erikson’s theory to mature adults, Gruen (1964) found no differences between sex, social class, and age groups on the first four stage scores, although women had significantly higher ratings on intimacy than did men, particularly in the 50- and 60-year-old groups of males and females. Gruen’s finding of a positive correlation between the scales, with the strongest relationships between adjacent stages, offered some preliminary support for Erikson’s idea of ego development as a sequential process.

A number of studies have examined the relationship between ego integrity and various other late life adjustment indexes, such as death anxiety (Fishman, 1992; Goebel & Boeck, 1987; Wacks, 1988), the ability to reminisce (Carlson, 1984; Moody, 1988; Sherman & Peak, 1991; Taft & Nehrke, 1990; Waters, 1990), and sleep disturbance (Wagner, Lorion, & Shipley, 1983). Others discuss attempts to enhance integrity through clinical interventions (e.g., Bennett & Maas, 1988; Richter, 1986; Sweeney, 1990). Whereas some
of these studies used scales developed specifically to measure resolution of the integrity crisis (e.g., Bennett & Maas, 1988; Sherman & Peak, 1991), others (e.g., Wagner et al., 1983) have measured integrity through the use of proxies thought to be redundant with integrity, such as life satisfaction, self-esteem, and depression.

Apart from the problems raised by a number of authors regarding the difficulty of measuring Eriksonian concepts (Maddi, 1980; Rosenthal et al., 1981; Simmons, 1970; Waterman, 1982), several investigators have argued against the utility of ego integrity as a valid descriptor of the experience of older persons. Clayton (1975), for example, contended that most individuals become fixated at earlier stages and thus fail to attain integrity with its accompanying virtue of wisdom, and concluded that Erikson’s articulation of the tasks of later life is insufficient. Such criticisms are not surprising given the failure of earlier attempts to operationalize Eriksonian adult stage constructs (Clayton & Birren, 1980).

In response to the relative scarcity of psychometrically sound measures and research on Erikson’s final life stage, the present study was launched to investigate the utility and correlates of ego integrity in a healthy, high-functioning elderly sample. A primary aim was to assess the extent to which the resolution of earlier psychosocial crises is related to ego integrity in later life, as is predicted by Erikson. A second purpose was to examine the relationship between integrity and other frequently used and well-validated constructs thought to be indicative of adult personality adjustment.

Method

Subjects

The 520 subjects (205 males, 305 females, and 10 subjects with gender designation missing) were between the ages of 55 and 84 (mean age = 68.5, SD = 5.1) and were attending the Elderhostel program at the University of Arizona. Elderhostel participants are primarily Caucasian retired persons from geographically diverse areas within the United States, including urban and rural areas. Almost all of the subjects (97%) were aged 60 and older, and most (61%) were widowed. Educational level was generally high; mean number of years of schooling completed was 16, and 27% had college degrees. A large proportion rated their health as "good" or "excellent." This group, then, represented a relatively affluent, mobile, and healthy sample of elderly persons.

Elderhostel is a program for senior citizens that offers week-long college-level courses on a noncredit basis at universities around the world. During a scheduled group meeting between classes, subjects were asked to cooperate in taking a battery of questionnaires “designed to determine the charac-
teristics of persons of this age range, since little is known about healthy and active older persons."

Measures

The measures used included an Eriksonian life stage measure called the Inventory of Psychosocial Balance (IPB; Domino & Affonso, 1990), the Rosenberg Self-Esteem Scale (SE; Rosenberg, 1965), the Purpose-in-Life Scale (PIL; Crumbaugh & Maholick, 1969), and the California Psychological Inventory (CPI) Self-Realization (Sr) scale (Gough, 1987), which was validated in a prior study (Domino & Hannah, 1989) as a measure of effective functioning in older persons.

INVENTORY OF PSYCHOSOCIAL BALANCE (IPB)

The IPB is a 120-item personality inventory requiring the respondent to indicate agreement or disagreement to each item on a 5-point Likert-type scale (strongly disagree to strongly agree). The IPB was designed to assess the degree to which individuals have successfully met the life stage tasks and resolved the psychosocial crises proposed by Erikson (1963, 1980, 1982). The measure yields eight scores, each corresponding to one of the eight life stages hypothesized by Erikson. Each of these stages is assessed by responses to 15 personality type questions. The items constituting the ego integrity scale are presented in Table 2.

The IPB was developed from an initial pool of 300 items written to reflect the eight stages. These items were administered to a sample of 528 subjects, including high school students (n = 66), college students (n = 103), graduate students (n = 26), nursing college students (n = 18), adult members of a religious social organization (n = 31), adult volunteers (n = 94), elderly members contacted through a social service agency (n = 35), retired adults (n = 87), and parents of college students (n = 68). Subjects were also asked to rate the degree to which they had successfully met each of 19 life challenges (e.g., trusting other people, being a productive person). The responses to the IPB were then subjected to a factor analysis and a correlational analysis with the self-ratings of life challenges. The results yielded eight factors corresponding to the eight stages. Items for each of the eight factors were retained if they met the following criteria: (a) largest structure coefficient on the designated factor, (b) structure coefficient of 1.30 or greater, and (c) statistically significant correlation of item with appropriate self-rating. Thus the items clustering together on a given factor were more strongly correlated than were items correlated with other factors. This use of the common factor model contributes to the assessment of convergent and discriminant validity (Ferketich, Figueredo, & Knapp, 1991; Figueredo,
Table 2
*IPB Items Reflecting the Eriksonian Ego Integrity Versus Despair Stage*

<table>
<thead>
<tr>
<th>Item</th>
</tr>
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<tbody>
<tr>
<td>1. Having friends is important to me.</td>
</tr>
<tr>
<td>2. I have confidence in my own abilities.</td>
</tr>
<tr>
<td>3. If I could relive my life, I would make few changes.</td>
</tr>
<tr>
<td>4. My religious or spiritual beliefs are stronger now than they have ever been.</td>
</tr>
<tr>
<td>5. You can break a person physically, but you can never take away their human dignity.</td>
</tr>
<tr>
<td>6. Life has been good to me.</td>
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<tr>
<td>7. I have left my mark on the world.</td>
</tr>
<tr>
<td>8. There are many things I enjoy in life.</td>
</tr>
<tr>
<td>9. I find little sense in living.</td>
</tr>
<tr>
<td>10. If I had the courage I would end my life.</td>
</tr>
<tr>
<td>11. I know what it means to have a strong sense of self.</td>
</tr>
<tr>
<td>12. When I die, I will be missed.</td>
</tr>
<tr>
<td>13. I have given serious thought to the meaning of life.</td>
</tr>
<tr>
<td>14. When one is old it makes no sense to start new hobbies or activities.</td>
</tr>
<tr>
<td>15. I keep physically active, within my body limits.</td>
</tr>
</tbody>
</table>

Ferketich, & Knapp, 1991). To control for response set, both positively and negatively worded items were retained for each factor.

To distinguish the Eriksonian life stages, the 15 items on each of the eight IPB subscales were originally screened by means of orthogonal (varimax) factor rotation to select the indicators with the highest discriminant validities. When factor scores are computed by unit weighting of variables, however, the eight subscales are highly intercorrelated, as one would expect from sequential and therefore serially dependent life stages. In comparison with differential weightings, using the factor pattern coefficient matrix unit weighting does not depend on precise estimates of factor loadings; therefore, factor score estimates remain stable when conducting cross-validation studies. Unit weightings were used to estimate IPB factor scores in the present study to exploit their higher external validity in generalizing multivariate results from the original screening sample to our subsequent independent sample from the same general population (Gorsuch, 1983).

Validity information is available in a series of three studies presented by Domino and Affonso (1990). The first of these compared IPB scores with the California Psychological Inventory (Gough, 1960) Social Maturity Index, which measures the extent to which the individual has developed from a position of “untutored, egocentric status” to one of “interpersonal affiliation and harmony.” This study revealed, for an adult population, moderate but statistically significant correlations with all IPB scales except autonomy and intimacy. A second study presented consistent Q-sort personological portraits of college-aged women who were high scoring versus low scoring on the IPB. The high-scoring women were seen as poised, productive, and philosophical, whereas the low scorers were viewed as neurotic and defensive.
Thus these first two studies presented evidence for the convergent validity of IPB scores. Discriminant validity was explored by the third study, in which 83 elderly adults were administered the IPB, along with the Marlowe-Crowne Scale of social desirability (Crowne & Marlowe, 1964), the Couch and Keniston (1960) Acquiescence Scale, the MMPI L and F scales (Hathaway & McKinley, 1967), the D-48 test—which is a culture-fair test of intelligence (Gough & Domino, 1963), and the Wonderlic Personnel Test—Form A (Wonderlic, 1973). Only 1 of the 48 correlations with the IPB scales was statistically significant, indicating that the IPB is free of "nuisance" components like test-taking response styles (Domino & Affonso, 1990).

To further document the discriminant validity of IPB scores, correlations with the clinical scales of the MMPI and with the 12 pathology scales of the SCL-90 (Derogatis, 1977) were run for a sample of 38 adults (Domino & Affonso, 1990). None of the correlations was found to be statistically significant.

Reliability data on the IPB were initially obtained from two samples: 102 college students (61 females and 41 males) attending the University of Arizona, who were heterogeneous in terms of major and year in college; and 68 adults in the community (34 females and 34 males, with a median age of 49), who were administered the IPB twice, one month apart. For the college students, alpha coefficients ranged from .48 to .74, and for the adult sample, test-retest coefficients ranged from .78 to .90 (Domino & Affonso, 1990).

Reliability estimates were obtained on scores from a initial smaller subset of Elderhostel subjects (n = 65) who participated in the present study. Internal consistency coefficients for the eight subscales were moderate and typical of those found for personality measures; they ranged from .40 (for autonomy) to .75 (for industry). Reliability data from an additional healthy elderly sample (mean age = 65, SD = 3.8) consisting of residents of an Arizona retirement community yielded alphas for the eight IPB scales ranging from .64 (intimacy) to .79 (industry), with a mean of .70 (Domino & Affonso, 1990). These alpha coefficients, although somewhat modest, are in the acceptable range and suggest that the items within scales are heterogeneous. Such heterogeneity would seem appropriate for dimensions as complex as Eriksonian stage scores and, in fact, for many other constructs representitive of psychological well-being. Thus the modest size of these alpha coefficients may not necessarily indicate low reliability; rather, as Anastasi (1988) indicates, it reflects both content heterogeneity and the complexity of the criterion. In fact, the IPB scales are intended not to define factorially homogeneous dimensions but to provide initial measures for what are rather complex themes of human behavior. Furthermore, the subjects themselves affect score reliability, and smaller coefficients would be expected in more homogeneous samples. Thus a more suitable measure of consistency includes the test-retest coefficients cited in Domino and Affonso (1990), which are quite high and
in the range obtained with most multivariate personality inventories.

Three non-Eriksonian measures of personality adjustment were chosen to examine the extent to which ego integrity may be predicted by a combination of these global adjustment measures as opposed to earlier Eriksonian developmental stage scores. A related issue being examined here was the complexity of ego integrity as a construct; for example, although self-esteem, confidence, or other dimensions of adjustment may be embedded in the notion of ego integrity, theoretically, ego integrity should prove to be more than the sum of these various dimensions of personality adjustment.

ROSENBERG SELF-ESTEEM SCALE (RSES)

The RSES (Rosenberg, 1965) is a well-validated global measure of self-esteem that has been extensively used in previous research on adults, including studies of the structure of psychological well-being in the elderly (Breytspraak & George, 1982; Lawton et al., 1984; Ryff, 1989b). As Ryff (1989b) pointed out, a positive attitude toward self has been a central feature of many perspectives on adjustment and should be included as a core dimension of a formula of well-being.

The scale consists of a set of 10 statements, some positively and some negatively worded, regarding the subject's opinions of his or her own self-worth. Respondents indicate agreement or disagreement with each statement by using a 5-point Likert-type scale. Reported test-retest reliability coefficients ($r = .85$) and coefficient alpha ($\alpha = .75$) are acceptable (Robbins, 1985), and, as evidence for validity, Rosenberg (1965) reported statistically significant correlations between self-esteem and depression.

PURPOSE-IN-LIFE SCALE (PIL)

A sense of having a purpose in life was measured using Crumbaugh and Maholick's (1969) Purpose-in-Life Scale, a 20-item instrument based on Frankl's (1955) conception of meaning in life. The authors of the PIL interpreted meaning as having goals in life and as that which gives direction to one’s life (Chang & Dodder, 1984). The developers conceptualized purpose in life as unidimensional, but a later investigation (Cote & Levine, 1983) derived two factors—future sense of purpose and present sense of purpose—on a sample of university students. Low scores indicate an "existential vacuum" in the person's life. Purpose in life is recommended in Ryff's (1989b) exploration of psychological well-being as an integral component of psychological maturity.

Reliability for PIL scores appears satisfactory, with split-half reliabilities in the .90 range. Patterns of correlations with other attitudinal and personality measures provide evidence of convergent validity, and adequate validity data are presented in the test manual (Crumbaugh & Maholick, 1969).
SELF-REALIZATION (Sr) SCALE

The Sr scale is derived from the California Psychological Inventory (CPI). The CPI (Gough, 1987) is a well-known personality inventory that has been recently revised. Factor and smallest space analyses of CPI (Levin & Karni, 1981; Nichols & Schnell, 1963) scores have indicated the presence of three major themes, labeled by Gough as internality, norm favoring, and self-realization. Data on reliability and validity, which are generally satisfactory, are available in Megargee (1972). The 58-item Sr scale, designed to measure effective functioning, self-realization, and fulfillment, was used to assess the relationship between this indicator of competent functioning and ego integrity. Self-realization, or the development of one’s potential, is similar to the dimension of personal growth mentioned by Ryff (1989b) as critical to optimal psychological functioning. Extensive normative data for the Sr scale are available for both male and female samples. An earlier analysis (Domino & Hannah, 1989) supported the use of the Sr scale as a global self-report of effective functioning that can be viewed in part as the end result of successful Eriksonian crises resolutions.

Statistical Analyses

A correlation matrix was computed to assess the bivariate relationships among Eriksonian stage scores and the non-Eriksonian personality constructs. Multiple regression analyses were performed using the SAS GLM (SAS Institute, 1985) procedure for hierarchical statistical significance testing. Standardized ordinary least squares (OLS) regression weights for the final model were computed using the SAS REG procedure for simultaneous parameter estimation. The most parsimonious and predictive model was arrived at by evaluating a series of alternative and hierarchically nested models.

These models were separately tested for statistical significance using $F$ ratios derived from the squared multiple correlations ($R^2$) and the whole model degrees of freedom. The statistics were directly compared between alternative nonnested models. For the hierarchically nested models, semipartial $F$ ratios, derived from the “difference” or semipartial squared multiple correlations ($sR^2$) and the difference degrees of freedom, were used to test the statistical significance of any regression parameters specified only in the more inclusive of the nested models (Cohen & Cohen, 1983). This is a formal procedure for selecting the optimal regression model, based on a priori hypotheses, ideally requiring the minimal number of parameter estimates to account for the maximal proportion of systematic variance.

Because the single dependent variable under consideration was ego integrity (IPB scale E8), the final life stage in the theoretical sequence, the seven preceding Eriksonian life stages (IPB scales E1 through E7) were forced into
the hierarchical regression model in reverse chronological order, from generativity to trust (E7 through E1). The forced entry of the stages in this order was based on Eriksonian theory, which suggests that the variability in ego integrity would be due primarily to the direct effects of generativity, which in turn are affected by the other six prior life stages.

The hierarchical procedure had the advantage of statistically controlling for any indirect effects (IEs) of earlier life stages on ego integrity through any of those in between. The regression weights reported, therefore, represent only the direct effects (DEs) of all preceding life stages on ego integrity. Although the explicit modeling of the many possible IEs would require a full factor analytic structural equations model, or common factor path analysis, the present hierarchical analysis implicitly controls for those complex effects at the final life stage of ego integrity without attempting to estimate all of the serial and variously time-lagged dependencies possible between sequential stages throughout the entire life span.

In addition, sex and age differences in the development of ego integrity were also tested by hierarchical regression. The main effects of sex and age, and the interactions of sex and age with each other with each of the seven preceding life stages (IPB factors E7 through E1), again forced into the equation in reverse chronological order, were estimated and tested for statistical significance hierarchically after the main effects of the first seven Eriksonian stages. Finally, three non-Eriksonian predictors—self-esteem (SE), the CPI Self-Realization (Sr) scale, and purpose-in-life (PIL)—were also tested as alternative hypotheses in order to apply the methods of strong inference (Platt, 1964). These were initially assigned a higher causal priority than the Eriksonian life stages in the hierarchical order to estimate and test for statistical significance the "unique" or incremental contributions of the IPB factors to the variance of ego integrity when controlling for these non-Eriksonian predictors.

Results

From an original sample of 520 subjects, listwise deletion of cases with missing values on any of the variables modeled reduced the working sample size to 221 subjects. The large amount of missing data was attributable primarily to the fact that, due to random and unavoidable time delays in subjects' schedules during certain weeks of the Elderhostel program, not all subgroups of the total 520 subjects were allotted sufficient time to complete all questionnaires. With the restricted number of variables tested, however, even by the full Model A (34 predictors), this subset of 221 yielded a case to variable ratio of 6.5:1. Although authorities vary in their estimates, such a ratio may be sufficient for drawing at least tentative conclusions (Bentler, 1989; Figueredo, Hetherington, & Sechrest, 1992).
Table 3

Bivariate Correlations Among Eriksonian and Non-Eriksonian Scales

<table>
<thead>
<tr>
<th></th>
<th>Sr</th>
<th>PIL</th>
<th>E1</th>
<th>E2</th>
<th>E3</th>
<th>E4</th>
<th>E5</th>
<th>E6</th>
<th>E7</th>
<th>E8</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE</td>
<td>-.15</td>
<td>.04</td>
<td>.08</td>
<td>.04</td>
<td>.04</td>
<td>.09</td>
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<td>.08</td>
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<td>.18</td>
<td>.20</td>
<td>.05</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>PIL</td>
<td>.21 **</td>
<td>.21 **</td>
<td>.19 **</td>
<td>.24 **</td>
<td>.22 **</td>
<td>.14 *</td>
<td>.16 *</td>
<td>.26 **</td>
<td></td>
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</tr>
<tr>
<td>E1</td>
<td>.83 **</td>
<td>.74 **</td>
<td>.79 **</td>
<td>.65 **</td>
<td>.65 **</td>
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<tr>
<td>E2</td>
<td>.77 **</td>
<td>.78 **</td>
<td>.68 **</td>
<td>.61 **</td>
<td>.72 **</td>
<td>.78 **</td>
<td></td>
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<tr>
<td>E3</td>
<td>.79 **</td>
<td>.64 **</td>
<td>.64 **</td>
<td>.73 **</td>
<td>.72 **</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>E4</td>
<td>.65 **</td>
<td>.65 **</td>
<td>.81 **</td>
<td>.79 **</td>
<td></td>
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<td>E5</td>
<td>.80 **</td>
<td>.79 **</td>
<td>.75 **</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>E6</td>
<td>.83 **</td>
<td>.77 **</td>
<td></td>
<td></td>
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<tr>
<td>E7</td>
<td>.86 **</td>
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<td></td>
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<td></td>
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</tr>
</tbody>
</table>

Note. SE = Rosenberg Self-Esteem Scale, Sr = Self-Realization Scale, PIL = Purpose-in-Life Scale, E8 = ego integrity, E7 = generativity, E6 = intimacy, E5 = identity, E4 = industry, E3 = initiative, E2 = autonomy, E1 = trust.
*p < .05; **p < .01.

The bivariate correlation matrix presented in Table 3 reports statistically significant intercorrelations between the Eriksonian scales. With the exception of autonomy and industry, the highest correlations were between adjacent stage scores—a finding that is consistent with Eriksonian theory, which assumes sequential interdependence of the developmental stages. The correlations between the Eriksonian scales and the non-Eriksonian constructs were low and typically nonsignificant, with a few exceptions; for example, the Purpose-in-Life score (PIL) had statistically significant correlations with all of the Erikson scales, although the actual amount of shared variance was small (e.g., r = .26, \( r^2 = .07 \) for the relationship between PIL and integrity, which showed the highest correlation among all pairs of Eriksonian and non-Eriksonian constructs). This relatively small degree of overlap between the non-Eriksonian constructs and Eriksonian scales provides some additional evidence for the discriminant validity of the IPB scales by demonstrating that the scales are measuring something other than these global adjustment constructs.

Eight alternative and hierarchically nested multiple regression models for scores on ego integrity were evaluated. This setwise elimination of predictors reduces the threat of capitalization on chance, or "alpha slippage," when doing multiple significance tests on each of the individual predictors (Cohen & Cohen, 1983).

A. An inclusive model with the main effects of all three non-Eriksonian predictors (SE, Sr, PIL), the main effects of all seven previous Eriksonian life stage scores (IPB factors E7 through E1), the main effect of sex, the interactions of sex with all seven previous stages (Sex \( \times \) E7 through E1), the main effect of age, the interactions of age with all seven previous stages (Age \( \times \) E7 through
E1), the interaction of sex with age (Sex \times Age), and the interactions of Sex \times Age with all seven previous stages (Sex \times Age \times E7 through E1). This full model incorporates considerations from previous literature suggesting that males and females differ in terms of the manner in which they encounter developmental issues, both in a global sense (e.g., Barnett & Baruch, 1978; Gilligan, 1979, 1982) and in terms of specific developmental tasks such as intimacy (Constantinople, 1969; Hodgson & Fischer, 1979; Ochse & Plug, 1986). Further, given that the range for age was rather large (55 to 84 years), the effects of age and its interactions with sex, as well as the three-way interactions between sex, age, and the Erikson scales, were also examined. These terms were included to rule out differences in the prediction of ego integrity based on age or sex (or their two-way interaction or their three-way interactions with the Erikson stages).

B. A restricted model with the main effects of all three non-Eriksonian predictors (SE, Sr, PIL), the main effects of all seven previous Eriksonian life stage scores (IPB factors E7 through E1), the main effect of sex, the interactions of sex with all seven previous stages, the main effect of age, and the interactions of age with all seven previous stages. This model was chosen for reasons similar to those cited for Model A above; the only terms eliminated here were the Age \times Sex interaction and the three-way interactions between sex, age, and the seven previous stages.

C. A restricted model with the main effects of all three non-Eriksonian predictors (SE, Sr, PIL), the main effects of all seven previous Eriksonian life stage scores (IPB factors E7 through E1), the main effect of sex, and the interactions of sex with all seven previous stages. In this model, age is not assumed to have an effect on the prediction of ego integrity (e.g., its predictors are the same for the “young old” and “old old”), although gender-based differences are considered.

D. A restricted model with the main effects of all three non-Eriksonian predictors (SE, Sr, PIL) and the main effects of the seven previous Eriksonian life stage scores (IPB factors E7 through E1). This model assumes that neither gender-nor aged-based differences in the prediction of ego integrity should be expected to emerge and examines the extent to which the prediction of integrity is maximized through a combination of earlier stage-related crises and additional personality adjustment constructs.

E. A restricted model with the main effects of all three non-Eriksonian predictors (SE, Sr, PIL). Model E tests for the proportion of variance in ego integrity accrued merely through the use of global adjustment measures, without considering earlier Eriksonian life stages.

F. A restricted model with the main effects of all seven previous Eriksonian life stage scores (IPB factors E7 through E1). Model F tests for the adequacy of Erikson’s earlier stage-related crises in predicting the final stage-related crisis.

G. A restricted model with only one previous Eriksonian life stage score (IPB factor E7). This model measures the power of generativity, the immediately preceding life stage, in predicting integrity, without considering earlier Eriksonian life stages.

H. A restricted model including five previous Eriksonian life stage scores (IPB factors E7, E6, E5, E2, and E1). These five scores (generativity, intimacy, identity, autonomy, and trust) were the Eriksonian stage scores yielding statistically significant regression weights by simultaneous least squares estimation.
Table 4  
Alternative Regression Models of Ego Integrity (E8)

<table>
<thead>
<tr>
<th>Model Description</th>
<th>$R^2$</th>
<th>Adjusted $R^2$</th>
<th>NDF, DDF</th>
<th>F Ratio</th>
<th>$p(\text{Ho})$</th>
</tr>
</thead>
<tbody>
<tr>
<td>A SE, Sr, PIL, E7 through E1, sex, Sex × E7 through E1, age, Age × E7 through E1, Sex × Age, Sex × Age × E7 through E1</td>
<td>.8858</td>
<td>.8647</td>
<td>34, 184</td>
<td>41.98</td>
<td>.0001</td>
</tr>
<tr>
<td>B SE, Sr, PIL, E7 through E1, sex, Sex × E7 through E1, age, Age × E7 through E1</td>
<td>.8769</td>
<td>.8602</td>
<td>26, 192</td>
<td>52.61</td>
<td>.0001</td>
</tr>
<tr>
<td>C SE, Sr, PIL, E7 through E1, sex, Sex × E7 through E1</td>
<td>.8635</td>
<td>.8517</td>
<td>18, 200</td>
<td>70.27</td>
<td>.0001</td>
</tr>
<tr>
<td>D SE, Sr, PIL, E7 through E1</td>
<td>.8514</td>
<td>.8380</td>
<td>10, 208</td>
<td>119.15</td>
<td>.0001</td>
</tr>
<tr>
<td>E SE, Sr, PIL</td>
<td>.0813</td>
<td>.0685</td>
<td>3, 215</td>
<td>6.34</td>
<td>.0004</td>
</tr>
<tr>
<td>F E7 through E1</td>
<td>.8480</td>
<td>.8430</td>
<td>7, 211</td>
<td>168.21</td>
<td>.0001</td>
</tr>
<tr>
<td>G E7</td>
<td>.7755</td>
<td>.7745</td>
<td>1, 217</td>
<td>749.47</td>
<td>.0001</td>
</tr>
<tr>
<td>H E7, E6, E5, E2, E1</td>
<td>.8478</td>
<td>.8442</td>
<td>5, 213</td>
<td>237.21</td>
<td>.0001</td>
</tr>
</tbody>
</table>

*Note.* SE = Rosenberg Self-Esteem Scale, Sr = Self-Realization Scale, PIL = Purpose-in-Life Scale, E8 = ego integrity, E7 = generativity, E6 = intimacy, E5 = identity, E4 = industry, E3 = initiative, E2 = autonomy, E1 = trust.

Hence, relative to Model A, Model B excludes Sex × Age and the interactions between Sex × Age and all previous Eriksonian life stage scores; relative to Model B, Model C excludes age and the interactions between age and all previous Eriksonian life stage scores; relative to Model C, Model D excludes sex and the interactions between sex and all previous Eriksonian life stage scores. Table 4 summarizes the results of these analyses.

Each nested model comparison (of successively ever more restricted models), listed symbolically in Table 5, tests for the statistical significance of the set of predictors that was last eliminated. The order of the models is based on the standard practice of entering the more complex interactions hierarchically last and, thus, eliminating them first. Table 5 summarizes the results of these model comparisons.

The first of these model restrictions turned out to be statistically acceptable, as indicated by the nonsignificance of the A-B nested model comparison, accounting for less than 1% of the variance. The second two model restrictions turned out to be rejectable by strict statistical criteria, as indicated by the statistical significance of the B-C and C-D model comparisons. Each of these two sets of eight predictors, however, accounted for less than 1.5% of the variance. Effects of such small magnitudes were deemed to be of such trivial consequence as to make virtually no contribution to either understanding of theory or to clinical practice and, thus, are potentially misleading in those contexts. This means that, in our estimation, there were no meaning-
ful sex or age differences in either ego integrity or the effects on ego integrity of any previous life stages.

Relative to Model D, Model E excludes all previous Eriksonian life stages while retaining all the non-Eriksonian predictors, and, conversely, Model F excludes all non-Eriksonian predictors while retaining all previous Eriksonian life stage scores. The first of these two model restrictions turned out to be statistically rejectable, as indicated by the statistical significance of the D-E nested model comparison, accounting for over 77% of the variance. The second of these two model restrictions turned out to be statistically acceptable, as indicated by the statistical significance of the D-F model comparisons, accounting for less than 0.5% of the variance.

Finally, relative to Model F, Model G eliminates all but the very last (E7) of the previous Eriksonian life stage scores, and Model H eliminates only two of them (E3 and E4). The theoretically extreme restrictions of Model G, representing the predictions of a "simplex" stage model, turned out to be statistically rejectable, as indicated by the statistical significance of the F-G nested model comparison, accounting for over 7% of the variance. The last restriction of Model H turned out to be statistically acceptable, as indicated by the statistical nonsignificance of the F-H nested model comparison, accounting for less than 0.5% of the variance. Thus Model H, which eliminates any of the Eriksonian and non-Eriksonian predictors that did not have statistically significant regression weights by simultaneous least squares estimation, yielded the optimal regression model tested. When summated, all of the hierarchically nested model restrictions combined (progressing from A to H) accounted for less than 4% of the variance, leaving nearly 85% of the variance in ego integrity predicted by the final model reported. The standardized simultaneous OLS parameter estimates and hierarchical significance tests for Model H are presented in Table 6.
Table 6
*Standard Simultaneous OLS Parameter Estimates and Hierarchical Significance Tests for Model H*

<table>
<thead>
<tr>
<th>Variable Name (Erikson Stage)</th>
<th>Beta Weight</th>
<th>NDF, DDF</th>
<th>F Ratio</th>
<th>p(Ho)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E7  Generativity</td>
<td>0.409</td>
<td>1, 213</td>
<td>1084.91</td>
<td>.0001</td>
</tr>
<tr>
<td>E6  Intimacy</td>
<td>0.146</td>
<td>1, 213</td>
<td>48.90</td>
<td>.0001</td>
</tr>
<tr>
<td>E5  Identity</td>
<td>0.073</td>
<td>1, 213</td>
<td>10.72</td>
<td>.0012</td>
</tr>
<tr>
<td>E2  Autonomy</td>
<td>0.066</td>
<td>1, 213</td>
<td>16.05</td>
<td>.0001</td>
</tr>
<tr>
<td>E1  Trust</td>
<td>0.297</td>
<td>1, 213</td>
<td>25.45</td>
<td>.0001</td>
</tr>
</tbody>
</table>

Discussion

The results in the present study suggest six conclusions. First, as is demonstrated by Model H in Table 4, the most predictive and parsimonious hierarchical regression model for predicting ego integrity included five of the seven previous Eriksonian stage scores (generativity, trust, intimacy, identity, and autonomy). The statistically significant contribution of each of the five Eriksonian stage scores to the prediction of scores on ego integrity supports Erikson's contention that achieving integrity is not an isolated task but a natural outgrowth of mastery attained during earlier stages.

Second, as revealed by the beta weight for generativity in Table 6, generativity (E7) emerged as the most powerful Eriksonian stage predictor of integrity (E8). This finding is congruent with Eriksonian theory, which suggests that, although all of the phases of life are interdependent, the disequilibrium introduced at each successive stage is triggered by the resolution of the immediately preceding stage-related crisis. Thus these findings support the notion that the achievement of ego integrity is inextricably linked with the quality of the resolution of the generativity stage.

The third finding was that neither initiative nor industry was a statistically significant predictor, as demonstrated by the statistically nonsignificant F-H model comparison in Table 5. A possible interpretation of these results is that job performance and occupational status may not be as salient as they are in youth and early middle age. Also, because these two scales reflect childhood stages, theoretically an argument might be made for their lesser role vis-à-vis adult integrity.

The fourth notable finding—that, after generativity, trust is the next most powerful predictor of ego integrity—is demonstrated by the beta weight for trust in Table 6. Here, ego integrity might be viewed as demanding a recapitulation of the issues inherent to the first life stage. Whereas in adolescence and in early and middle adulthood, work- and performance-related issues take precedence (as was discussed in regards to the findings on
initiative and industry), the final life phase thrusts interpersonal issues back onto center stage. What might unite both generativity and trust in terms of their relationship with ego integrity is their focus on the primacy of relationships—one's relationship to one's parents in the trust stage and one's relationship to one's own children in the generativity stage. The statistical significance of both generativity and trust in the prediction of ego integrity, then, might underscore the centrality of such themes to ego integrity.

Fifth, these data suggest that little information about ego integrity is contributed by knowledge of the individual's sense of self-esteem, competence, and/or purpose in life. Although the model using the three non-Eriksonian predictors in combination predicted a statistically significant proportion of the variance in ego integrity—as is revealed by the statistics associated with Model E in Table 4—the actual quantity of predicted variance (8%) is so small that the clinical significance of this set of predictors is called into question. Including all seven Eriksonian stage scores in the equation, on the other hand, greatly increased the predictive power (from 8% to approximately 85% of the variance), as is demonstrated by the $R^2$ value for Model F in Table 4. Likewise, the increment in predictive power yielded by including the three non-Eriksonian constructs in the equation with the Eriksonian predictors was negligible: The D-F model comparison in Table 5 yielded an $R^2$ value of .003. Given that self-esteem, competence, and purpose-in-life scores contribute little additional information to the prediction of ego integrity, it seems reasonable to conclude that indicators such as a sense of meaning in life and self-esteem are likely embedded within the Eriksonian concepts. For at least one of these indicators—self-esteem—the finding was consistent with the observations of Erikson (1980), who pointed out that the resolution of developmental crises gradually contributes to the individual's self-esteem.

The sixth and final finding was somewhat surprising. Based on the $R^2$ value associated with the C-D model comparison in Table 5, it can be concluded that no meaningful differences emerged between men and women on the prediction of ego integrity. Previous literature (e.g., Constantinople, 1969; Hodgson & Fischer, 1979; Ochse & Plug, 1986; Rosenthal et al., 1981) suggests that both sex and age differences exist in the absolute levels of certain previous life stages, such as intimacy. Some theorists (e.g., Barnett & Baruch, 1978; Gilligan, 1979, 1982), in fact, have argued against the applicability of developmental theories such as Erikson's to women's experience (Ryff, 1984). Although the interactions between sex and Eriksonian stages and between age and Eriksonian stages (B-C model comparison in Table 5) achieved statistical significance, the proportion of variance accrued by each interaction was too small (less than 1.5% of the variance) to warrant clinical importance. Further, the lack of meaningful differences between men and women on the prediction of ego integrity was not related to age (statistical nonsignificance of the A-B model comparison in Table 5) as might be expected, given the changes in traditional sex-role expectations that have
occurred during the lifetime of this elderly cohort. It may be that such sex-role expectations, which might have been operating in earlier studies, were less salient for this relatively well-educated and sophisticated sample of elderly persons.

Although the results are encouraging in terms of the evidence supporting Eriksonian theory, limitations of the study must be mentioned. We presumed that chronological age (in general, over 60) implies that an individual is confronted with the psychosocial stage of integrity versus despair. This assumption is challenged by Peck (1968), who argued that there is considerable variability among adults on the pace with which developmental tasks are faced. The internal consistency coefficients of the IPB stage scores are modest, although this may be explained by the fact that Eriksonian personality components are complex (Ochse & Plug, 1986).

It is possible that, due to the use of multiple tests of the hierarchical regression models, the finding of model H as the “best” model is due to capitalization on chance, although the use of theory-driven setwise elimination of predictors offers substantial protection against that possibility. Finally, it is impossible to determine from the available data whether other important non-Eriksonian constructs, such as happiness or life satisfaction, would have added noteworthy additional information about the nature of ego integrity (i.e., whether there were specification errors). Still, in light of the relative dearth of empirical data on the final life stage and the ever-increasing size of the population to which these results can be applied, these findings offer additional evidence regarding the nature of ego integrity as a outcome of the personality adjustment process in older persons.

References


