J. KEVIN McNEIL, M. J. STONES AND ALBERT KOZMA

SUBJECTIVE WELL-BEING IN LATER LIFE: ISSUES CONCERNING MEASUREMENT AND PREDICTION

(Received 11 October, 1985)

ABSTRACT. This paper reviews the research on the measurement and prediction of subjective well-being in later life. Psychometric data on several gerontological scales are presented in detail. Structural analyses of a variety of measures of subjective well-being are discussed and evidence for a one factor structural solution to subjective well-being is presented. Objective predictors of subjective well-being are discussed with respect to the strength of their relationships to subjective well-being. It is concluded that subjective well-being is the best predictor of itself. Evidence of temporal stability and corss-situational consistency, combined with the evidence of a one factor structural solution, suggests that subjective well-being has trait-like characteristics. Suggestions for future research are presented.

Later life (i.e., 65 years and over) is accompanied by many physical, environmental and emotional changes. Some of these changes are gradual, such as deteriorating health; others, like the death of a spouse, are sudden. Not all changes are negative, however. Retirement and freedom from familial responsibility as well as the wisdom of experience can make later life a very positive part of the life cycle. Psychology and gerontology have spent the past 35 years searching for answers to the question: "What are the factors that influence subjective well-being in later life?" This paper reviews the literature and continues the search.

The terms subjective well-being, adjustment, life satisfaction, happiness, and morale all refer to aspects of mental health or subjective well-being (e.g., Antonucci, 1974; Atchley, 1971; Conner and Powers, 1975; Dressler, 1973; Kuhlen, 1948; Lepkowski, 1956; Lieberman, 1975; Loeb, 1975, Pan, 1948, Perlin and Schooler, 1978; Stokes and Maddox, 1967; Stones and Kozma, 1980b; Thompson, 1958). The use of so many different terms for the same underlying construct has led to much discussion and considerable confusion in the literature over exactly what is being measured (e.g., Britton, 1963; Britton and Mather, 1958; Cumming *et al.*, 1958; Gehrmann, 1978; Graney and Graney, 1973; Lawton, 1983; Levy and Guttman, 1975; Michalos, 1980; Pierce and Clark, 1973; Shin and Johnson, 1978; War *et al.*, 1979; Wilson, 1967). Many of these variously termed measures have been shown to

Social Indicators Research **18** (1986) 35–70.

be significantly correlated (Carp and Carp, 1982a; Larson, 1978; Moriwaki, 1974), indicating a convergence of meaning among the scales. In this paper, subjective well-being, like life satisfaction, morale, and happiness, all will be used to refer to the general construct.

MEASUREMENT

Measures of subjective well-being include single-item, multi-item, geriatric, and non-geriatric scales. Single-item scales generally ask respondents to rate global feelings of subjective well-being such as "Generally, how are things going these days?" (e.g., Andrews and Withey, 1976; Cantril 1965). Although single-item scales have received limited acceptance in the literature, they offer little information concerning scale reliability and the structure of the construct. Because of these limitations, they will not be reviewed in this paper.

Multi-item scales have provided a greater contribution to the understanding of the structure of subjective well-being. This increased understanding arises because different aspects of the construct can be evaluated by individual items (or combinations of items) within the scale. Also, estimates of internal consistency can be calculated. As a result, multi-item scales have the advantage of being subject to more rigorous psychometric evaluation than single-item scales.

Geriatric scales form a substantial percentage of the available subjective well-being multi-item measures. These scales have been standardized on the elderly and usually contain item content that is specific to them (e.g., the life satisfaction scales of Neugarten *et al.*, 1961, and Wood *et al.*, 1969; the happiness scale of Kozma and Stones, 1983a; and the morale scale of Lawton, 1975). Non-geriatric scales cover many ages, including the elderly (e.g., Andrews and Withey, 1976; Campbell *et al.*, 1976; Diener *et al.*, 1983). Geriatric scales are older and have been researched more extensively than non-geriatric scales. They provide more information about the structure of subjective well-being in the elderly. For these reasons, this review will concentrate almost exclusively on them, with reference to non-geriatric scales made only if relevant to the structure of subjective well-being of the elderly.

Scales of Subjective Well-Being

Life satisfaction scales

The Life Satisfaction Indices A and B (LSI-A and -B) are alternate test forms that were developed by Neugarten *et al.* (1961). The LSI-A is a self-report measure consisting of 20 attitude items scored by the subject as either "agree" or "disagree". The LSI-B, a 17-item scale, is also a self-report measure and consists of open-ended questions scored on a 3-point scale. The LSI-Z was developed by Wood *et al.* (1969) as a short form of the LSI-A and -B scales. The LSI-Z is a 13-item self-report scale with a 5-point response format on a strongly agree to strongly disagree dimension.

The Life Satisfaction Rating Scale (LSR) consists of five items representing the five components of life satisfaction as construed by Neugarten *et al.* (1961), i.e., zest, resolution and fortitude, congruence between desired and achieved goals, positive self concept, and mood tone. Using in-depth interviews, judges rated respondents on a 5-point scale for each of the five components. Validity of the LSR was established by intercorrelations with assessments by clinical psychologists. The LSR was used as a criterion measure for all of the "LS" scales (LSI-A, -B and -Z) and was also used as a basis upon which the LSI-A and -B scales were constructed (i.e., the same structure was assumed).

Validity scores, as represented by correlation coefficients of the LSR with the LSI-A was 0.55; with the LSI-B was 0.58 (Neugarten *et al.*, 1961); and with the LSI-Z was 0.57 (Wood *et al.*, 1969). These validity coefficients become less impressive when consideration is given to the subjective nature of the LSR and clinical psychologists' assessments. Convergent validity of the LSI-A averages a respectable 0.73 when compared to six other geriatric scales (Lohmann, 1977). Similiar comparisons by Lohmann (1977) have obtained scores of 0.68 for the LSI-B, and 0.68 for the LSI-Z.

Problems with these Life Satisfaction measures are that (a) several factors aside from life satisfaction have been repeatedly identified such as mood tone and zest for life (Adams, 1969; George, 1979; Klemmack *et al.*, 1974), (b) analysis by Hoyt and Creech (1983) indicates that both the numbers and the content of the components of the Life Satisfaction measures differ from those proposed by Neugarten *et al.* (1961), and (c) the components of the Life Satisfaction scales correlate rather highly with each other, placing doubt

on the independence of the components. As a final comment, only the LSI-Z form has been developed on a purely elderly population (65 years, plus). The LSI-A, -B, and LSR scales were constructed on a population 40% of whom were between the ages of 50 and 63. This age-skewed distribution in favor of the younger elderly makes the LSI-A and -B scales of questionable validity for use with elderly populations, especially the very old (e.g., 80 years, plus).

Estimates of internal consistency for the LSI-A have been reported to be in the vicinity of 0.80 (Larson, 1978; Carp and Carp, 1983). Alpha coefficients for the LSI-Z of 0.80 have been obtained by Stock and Okun (1982), and 0.74 and 0.84 by Himmelfarb and Murrell (1983) on a community and clinical sample, respectively. These latter two scores provide evidence of the ability of the LSI-Z to provide reliable measurement across different groups (Himmelfarb and Murrell (1983). Test-retest reliability, on the other hand, has been shown to be low ($r = 0.35$ over a period of up to 12 months; Kozma and Stones, 1980).

The Philadelphia Geriatric Center morale scale

The PGC was originally developed by Lawton (1972) as a 22-item, six-factor, yes/no response format scale and later revised (PGC-R) into a 17-item three-factor scale (Lawton, 1975). These three factors have been found repeatedly (George and Bearon, 1980; Liang and Bollen, 1983; Morris and Sherwood, 1975; Schooler, 1970). The factors have been labelled as agitation, dissatisfaction, and attitudes towards own aging. Alpha coefficients of 0.85, 0.85 and 0.81, respectively, have been obtained for these factors. These alpha coefficients are among the highest obtained for multi-item subjective well-being scales and attest to the psychometric strength of the PGC. Convergent validity of the PGC-R with nine other well-being measures is respectable, averaging 0.73 (range, 0.45 to 0.95) (Lohmann, 1977).

The Affect Balance Scale

Another way to measure subjective well-being in later life is through happiness scales. Bradburn (1969) developed a scale called the Affect Balance Scale (ABS). This scale is a 10-item instrument which uses a yes/no response

format. Half of the items reflect positive affect (Positive Affect Scale, or PAS) and half reflect negative affect (NAS).

Overall happiness is viewed as the balance between positive and negative experiences that have occurred in the past few weeks (ABS = PAS − NAS). In several studies, the PAS and the NAS have been shown to be unrelated to each other. Moreover, the PAS correlates with variables that the NAS does not, and *vice versa* (Andrews and Withey, 1976; Bradburn, 1969; Bryant and Veroff, 1982; Cherlin and Reader, 1975; Lowenthal *et al.*, 1975; Moriwaki, 1974; Warr, 1978; Warr *et al.*, 1983). These relationships hold even when scoring procedures of the ABS are changed from dichotomous responses to a rating scale format, a feature which contributes to the validity of this instrument (Lowenthal *et al.*, 1975).

Bradburn's two factor concept of happiness has received further support from Lawton (1983). Lawton's second order factor analysis of several subjective well-being instruments, including the ABS, revealed two factors. Negative affect loaded heavily on the first and positive affect on the second, while happiness loaded highly and similarly on both, indicating that PA and NA are independent of each other but are both related to happiness. Fengler *et al.* (1983) found a similar first order structure in their National Opinion Research Center (NORC) happiness measure. In another first order study of the ABS, Beiser (1974) found that positive and negative components contained limited variance in common with long-term satisfaction. Validity estimates of the ABS include convergent correlations of 0.61 with the Roscow Morale Scale (Moriwaki, 1974) and 0.66 with the LSI-A (Bild and Havighurst, 1976). On the other hand, the test retest reliability of the scale over a 12 month period was only 0.27 (Kozma and Stones, 1980), and its internal consistency averaged only 0.60 (Himmelfarb and Murrell, 1983; Kozma and Stones, 1980).

In addition to reliability problems, reported difficulties with this scale include: (a) too narrow a range of items relevant to happiness, resulting in the exclusion of the dispositional aspects of happiness (Stones and Kozma, 1980b); (b) fundamental differences in PAS/NAS content (Diener and Emmons, 1984); (c) the interdependence of positive and negative affect represented by correlations of −0.36 to −0.58 with changes in item type (Brenner, 1975) or scoring (Carp and Carp, 1983); and (d) the measurement of the occurrence of feelings and not their intensity or frequency (Diener,

1984). Perhaps the greatest problem with the scale is the inability of the combined scales to provide significantly greater predictive power than their single contribution (Cherlin and Reeder, 1975).

Memorial University of Newfoundland Scale of Happiness

The Memorial University of Newfoundland Scale of Happiness (MUNSH) was developed by Kozma and Stones (1980). This 24-item self-report instrument was validated on samples of elderly individuals from urban, rural, and institutional settings and in two Canadian provinces (Kozma and Stones, 1983a, 1983b). The criterion for item selection was a high correlation with self-avowed happiness, a procedure that was recognized as an advancement in the subjective well-being literature by Lawton (1984). Four subscales were developed, consisting of: five positive affect items (PA), five negative affect items (NA), seven positive experience items (PE), and seven negative experience items (NE). The subscales intercorrelate within a range of 0.35 to 0.70 and load on a single factor in second order analysis, indicating a unitary bipolar structure (Stones and Kozma, 1985). The internal consistency for the whole scale is high (alpha = 0.853). Responses are scored two for yes, one for don't know, and zero for no, with total happiness score (MUNSH total) = PA – NA + PE – NE. The MUNSH measures happiness over relatively long periods (i.e., months and years), thus focusing on both the dispositional and shorter-term features of happiness. This contrasts with a scale such as the ABS which measures affect over a one month period. Test-retest reliability of the MUNSH, compared to those of other scales (eg., ABS, PGC, LSI-Z) is high; $r = 0.70$. An 18-month stability coefficient accounted for an average of 86% of the total explained variance (Kozma and Stones, 1983a).

The MUNSH has been validated by high intercorrelations with other scales (Kozma and Stones, 1980), against behavioral criteria (Stones and Kozma, 1980a) against judge ratings (Kozma and Stones, 1983b), and in a group discrimination study (Kozma *et al.*, 1985). The latter study also indicated high internal consistency at younger age levels (below 30 years) as well as among older adults, and a negligible independent contribution of response artifact (i.e., denial of pathology).

Other scales

A number of other multi-item geriatric scales have been developed. In general these scales have not been studied extensively and add little information to that already known (e.g., Bigot, 1974; Fengler *et al.*, 1983; Gilleard, 1981; Guldin, 1976; Roscow, 1977). Older scales (e.g., the Cavan Scale by Cavan *et al.*, 1949; the Dean Morale Scale by Cumming *et al.*, 1958; and the Kutner Morale Scale by Kutner *et al.*, 1956) are important historically for pioneering the measurement of subjective well-being in the elderly. Some scales like the Lohmann Life Satisfaction Scale (LLSS) (Lohmann, 1980) and the Carp and Carp (1983) scale are combinations of other scales (with revisions). Often this method of combining and revising previously standardized scales results in improvements, as evidenced by high alpha coefficients of 0.885 for the LLSS and 0.868 for the factors of the Carp and Carp (1983) scale. An added advantage of the Carp and Carp (1983) scale is that it is unbiased for age and gender and is therefore suitable for a variety of populations.

Recker and Wong (1984) have measured subjective or psychological well-being as one factor in a two-factor Perceived Well-Being Scale (PWB). The second factor is perceived physical well-being. A two-year test-retest reliability of the six-item subjective well-being subscale was 0.79. The validity of this subscale has been established by its highly significant correlations with the MUNSH, the Beck Depression Scale, and measures of personal commitment and personal optimism.

The Structure of Subjective Well-Being

The "structure" of subjective well-being refers to the factors that contribute to subjective well-being. Evidence concerning structure derives from three types of factor analyses: (a) first order analysis of the items from individual scales, (b) first order analysis of the items of combined scales, and (c) second order analysis of the scale scores.

First order factor analysis: separate scales

The structure of subjective well-being was referred to earlier when reviewing the individual scales. Neugarten *et al.*, (1961), it was noted, reasoned that life satisfaction consisted of five components: zest versus apathy, resolution and

fortitude, congruence between desired and achieved goals, self-concept, and mood tone. Attempts to verify Neugarten *et al.*'s (1961) notion of a five-component structure have not been successful. Adams (1969), for example, in a rotated factor analytic examination of an 18-item version of the LSI-A found a four factor solution. The first three factors were labelled congruence, mood tone, and zest for life. The fourth factor was not named. Hoyt and Creech (1983) and Wilson *et al.* (1985) found that factor analysis of an 11-item LSI using groups differing on the basis of race, gender, age and income resulted in different structural solutions. When an 8-item version of the LSI was analized, both Hoyt and Creech (1983) and Wilson *et al.* (1985) obtained three factors which were invariant across groups. These three factors corresponded to the first three factors found by Adams (1969). Dobson *et al.* (1979) found four factors in an analysis of the LSI-Z. Two of these factors overlapped, one with a measure of anomia (the extent to which an individual feels integrated into a social network) and one with a measure of self-esteem. (The other two factors were not named.) Dobson *et al.*'s (1979) results indicate that the LSI-Z measures constructs other than those associated with life satisfaction.

Overall, Neugarten *et al.*'s (1961) proposal of a five-component structure of life satisfaction is not supported by the data. However, three similar factors have been repeatedly identified.

The structure of well-being has been analyzed using morale scales as well as life satisfaction measures. Lawton (1972) initially found six factors in an analysis of the PGC and then three factors in a revised edition (PGC-R; Lawton, 1975). The three factors were labelled agitation, dissatisfaction, and attitude towards own aging. This three factor solution was replicated by several authors (eg., George and Bearon, 1980; Morris and Sherwood, 1975; Schooler, 1970).

Both life satisfaction and morale scales are similar in structure in that they both have been found repeatedly to consist of three factors. Among these three factors, a satisfaction component is common to both types of scale. The agitation factor on the PGC-R and the zest for life factor of the LSI-A are unique components of each scale, indicating that while both scales may overlap in their measurement of subjective well-being, they also measure something different.

Happiness scales have also been factor analyzed to determine the structure of happiness. Two independent components of positive and negative affect

have been identified by Bradburn (1969) and others (see text under Affect Balance Scale). These two components have been related to the independent personality dimensions of extroversion and neuroticism, respectively (Costa and McCrae, 1980). According to Costa and McCrea's (1980) model, the PAS and the NAS are "subjectively balanced" (p. 675) by the individual to yield a sense of overall subjective well-being.

First order factor analysis: combined scales

Another approach to structural analysis of subjective well-being was carried out by Carp and Carp (1983). These authors factor analyzed the items of a number of subjective well-being scales collectively (i.e., the Index of Well-Being and the happiness item developed by Campbell *et al.*, 1976; the ABS; the Carp and Carp, 1982a, Index of Well-Being; the PGC; the Cavan Adjustment Scale and the LSI-A). With all of these scales, a common five-point rating scale format was used rather than their original response formats. The advantage of including such a broad array of items in a factor analysis is that such an analysis presumably taps different aspects of subjective well-being. Four factors resulted; a sense of well-being, negative affect, positive affect, and fearlessness/worry.

Another study which factor analyzed the items of a combination of subjective well-being scales was performed by Lohmann (1980). The Cavan Adjustment Scale, the Kutner Morale Scale, the Dean Scale, the LSI-A and -B, the PGC, a global question, the LSI-Z and an altered LSI-A by Adams (1969) were used in this analysis. A common agree/disagree response format was used. Two factors emerged, together accounting for 37.7% of the variance. Both of the factors were given the term "life satisfaction". The difference between factor one and factor two was attributed to negative and positive response style.

Lawton, Kleban, and di Carlo (1984) factor analysis of 144 items from four scales related to well-being resulted in 12 factors. The first factor was labelled happiness and accounted for 16% of the total subjective well-being variance. All 12 factors accounted for 41% of the total subjective well-being variance, indicating small contributions to the total variance by the remaining 11 factors.

To summarize, first order factor analysis of subjective well-being scales have found multi-factor structural solutions. These solutions vary both

within and between scales of subjective well-being both in the number of factors and in the types of factors. A possible reason for this inconsistency is that some of the items in first order analysis are less relevant to subjective well-being than others. The presence of these less relevant items would result in separate or altered factors. Even when scales are combined, no agreement is found in the structure of subjective well-being.

An additional problem with the first order factor analysis, in addition to inconsistency, is that correlations have been obtained between factors of specific scales (e.g., Adams, 1969; Hoyt and Creech, 1983). Inter correlations as high as 0.594 have been found between factors (Hoyt and Creech, 1983), indicating that separate factors are measuring something similar. The inability of first order factor analysis to account for this "something similar" suggests that first order factor analysis does not provide a complete account of the structure of well-being.

Second order factor analysis

Another approach to studying the structure of subjective well-being is second order factor analysis. This approach involves factoring an array of single-dimension variables (such as scales or first order factors) as opposed to items of scales.

Second order factor analyses on a variety of well-being data repeatedly isolate one main factor that accounts for over half of the variance (Andrews and Withey, 1976; Kammann *et al.*, 1984; Liang, 1984, 1985; Liang and Bollen, 1983; Stones and Kozma, 1985). A second factor, termed positive affect, was described by Andrews and Withey (1976) to account for 15% of the variance and by Kammann *et al.* (1984) to account for 7% of the variance. Stones and Kozma (1985), in a discussion of second order factor analysis on happiness measures, point out that Andrews and Withey's (1976) additional factors (a third factor, labelled negative affect, was also found which accounted for 16% of the variance) may be the result of the inclusion of confounded variables in the matrix array. Scales are included in Andrews and Withey's (1976) second order factor analysis which are very similar to one another but which differ in subtle ways such as in response format. Consequently, the number of factors as well as the variance contribution of each factor would be altered, making this analysis inaccurate. The second factor isolated by Kammann *et al.* (1984), positive affect, disappeared when they

deleted the component subscales of the ABS (i.e., PAS and NAS) from their data. Since this second factor is represented by only one scale, its validity as a factor of subjective well-being is doubtful.

When all the methodological errors have been accounted for, what is left agrees with the findings of a number of authors (e.g., Laing, 1984, 1985; Laing and Bollen, 1983; Stones and Kozma, 1985) which support a one-factor second order structural solution of subjective well-being. This factor has been labelled subjective well-being or happiness (Stones and Kozma, 1985).

Lawton (1983) provides data which support the one factor solution of subjective well-being even when well-being is evaluated on a larger scale beyond its subjective dimension. Lawton (1983) found that subjective or internal well-being made up one factor in a second order factor solution of 14 variables that consisted of a combination of internal and external measures of general well-being. The second factor was labelled exterior well-being.

A one factor solution supports other data which has shown that separate scales of subjective well-being intercorrelate, often highly (Bild and Havighurst, 1976; Lohmann, 1977; Moriwaki, 1974), indicating that these scales are measuring something similar.

PREDICTORS OF SUBJECTIVE WELL-BEING

Aside from accurate measurement, researchers are also interested in which variables determine or predict subjective well-being. Many predictors have been studied; in this paper, attention will be confined to those predictors for which *objective* measurement was obtained in the relevant studies. Some predictors can be measured both objectively and subjectively (e.g., objective and perceived health, housing conditions and housing satisfaction, etc.) We will omit discussion of the subjective indicators on the basis of the theoretical standpoint that subjective domain predictors and global subjective well-being are measures of the same phenomenon. In such a conceptualization (referred to as top-down or domain inclusive: see Andrews and Withey, 1976; Diener, 1984; Stones and Kozma, 1980b) subjective indicators may be influenced rather than influence global well-being. Where relevant, individual predictors are also discussed in terms of their measurement and structure.

Unless otherwise stated, the statistical relationships cited below are all significant.

Health

Health has repeatedly been shown to be one of the most important of the domain variables that affect subjective well-being. A number of reviews are available that deal extensively with establishing the health/subjective well-being relationship (e.g., Okun *et al.*, 1984a; Zautra and Hempel, 1984; George and Landerman, 1984). The sizes of the relationships between health and subjective well-being are generally between 0.3 to 0.4 for zero- and first-order relationships ("zero-order" refers to bivariate relationships such as Pearson product-moment correlations, and "first-order" refers to relationships involving more than two covariates, such as in multiple regression.)

The range of correlations between health and subjective well-being has been uncovered by researchers using methods such as meta-analysis (e.g., Okun *et al.*, 1984a) and secondary data analysis (e.g., George and Landerman, 1984) in which data from a variety of studies of different quality are compared. In Okun *et al.*'s (1984a) study, data from studies of differing quality (rated as good, fair and poor by judges) did not reveal major differences in the health/subjective well-being relationship. However, the criteria used to determine study quality were not reported, making evaluation of their procedure difficult. Based upon the rather low reliability of judges' ratings (Pearson $r = 0.66$), one should interpret these equitable health/subjective well-being relationships among good, fair, and poor studies with caution. Other reviewers are also guilty of combining results from many studies without due regard to quality (e.g., George and Landerman, 1984; Larson, 1978; Zautra and Hempel, 1984). An alternate approach to the synthesis of data on the health/subjective well-being relationship is to select only the "best" studies for meta- or other types of analysis.

Criticisms aside, the information available on the health/subjective well-being relationship is that in almost all cases correlations are positive, significant and account for an important amount of the variance (i.e., approximately 10 to 16%, depending upon the source). This makes health one of the most important of the subjective well-being domains of the elderly.

Activities

One of the main impediments to progress in understanding the relationship between subjective well-being and activities has been the lack of a standard

activities inventory (Kozma and Stones, 1978). The implications of this lack include a failure both to define and measure activities consistently across studies. The most carefully developed and validated activities inventory probably is the Memorial University of Newfoundland Activities Inventory (MUNAI: Stones and Kozma, in press-a). The first stage in its development consisted of cassette recorded interviews with 300 elderly residents from urban, rural, and institutional locations. Each interview focussed on (a) routine daily activities, (b) routine weekly activities, and (c) less frequent or special activities. The interview transcripts were evaluated by three judges and a 37-item inventory was compiled that reflected recurrent themes of content. The second phase of development involved administration of the MUNAI and other instruments to 408 elderly subjects as part of a 1.5 year longitudinal study. The structural stability of the MUNAI was indicated by the emergence of the same five-factor solution at both longitudinal phases. The factors were (a) household independence, (b) family involvement, (c) solitary activity, (d) community involvement, and (e) homemaker activity. Temporal stabilities for overall activity level and levels of the structural components exceeded 0.69 for all except the community involvement index.

Zero-order relationships between the MUNSH and the overall MUNAI index were in the range of 0.25 to 0.35. Although multiple correlations of the MUNSH against all the MUNAI items were within the range of 0.43 to 0.63, two-thirds of the items did not show a stable pattern of first-order relationship to the MUNSH across longitudinal phases. Stones and Kozma (in press-a) concluded that the stable common variance between subjective well-being and activities probably is in the region of 10%.

Social activity

Okun *et al.* (1984b), in a meta-analysis on a total of 556 sources relating social activity to subjective well-being, found that social activity significantly predicted between 1 and 8% of the subjective well-being variance (approximately half of that predicted by health). First order relationships were found to be higher than zero-order relationships (ragens of 0.12 to 0.28 versus 0.12 to 0.18, respectively). This finding indicates that much of the effect of social activity on subjective well-being is controlled by other variables (i.e., age, education, income, marital status). A problem with this meta-analysis, as was the case for the health/subjective well-being meta-analysis, is that the analysis

is based upon a combination of studies of mixed quality. To ensure accuracy, meta-analysis based upon only the "best" studies, are suggested.

Further discussion of social activity can be aided by its division into two broad categories: formal activities, such as social interactions with voluntary organizations; and informal activities, such as social interactions with family and friends (Okun *et al.*, 1984b; Owens, 1982). Longino and Kart (1982) analyzed the effect of informal and formal activity (using a multi-item behavioral scale) on life satisfaction (as measured by the LSI-B). The results indicated that informal activity was positively and significantly related to life satisfaction and that formal activity was negatively and significantly related to life satisfaction.

Opposite trends were obtained by Stones and Kozma (in press-a). Community involvement (an index of formal activity) yielded the highest contribution of all the MUNAI components to the variance in subjective well-being at both longitudinal phases. Family involvement (a specific index of formal activity) provided a significant first-order contribution at one phase only.

Lemon *et al.* (1972) found no relationship between formal social activity and subjective well-being but did find a significant correlation for the informal/subjective well-being relationship. Okun *et al.* (1984b), on the other hand, found that both formal and informal social activities were positively related to subjective well-being. Graney (1975) found that all three of his measures of formal activity, and two of the three informal measures, were both positively and significantly related to happiness.

Overall, therefore, there is little consistency among the various studies on the influence of formal social activity on subjective well-being. One reason for this inconsistency is the lack of standardized measures of social activity.

A third category of social activity, and one that has received little attention in the subjective well-being literature, is solitary activity. Stones and Kozma (in press-a) found a significant first-order relationship of solitary activity to happiness at only one of two longitudinal phases. Longino and Kart (1982) found that solitary activity (measured as the number of day segments in which the respondent engaged in particular hobbies and leisure activities) had no effect on life satisfaction (i.e., LSI-B).

Quantitative studies of social activity have considered two components of social interaction; the frequency (i.e., the number of interactions) and the

scope (i.e., the number of persons in one's social network). Some research has indicated that the quantitative aspects of social interaction are related to the elderly's subjective well-being (e.g., Davidson and Cotter, 1982; Graney, 1975; Lowenthal and Haven, 1968; Markides and Martin, 1979; Philblad and Adams, 1972; Schooler *et al.*, 1981; Tobin and Neugarten, 1961). Other studies have found that quality (i.e., intimacy) of social activity is more highly related to the morale of aging individuals than quantity (e.g., Chelsvig, 1983; Conner *et al.*, 1979; DeMellier, 1982; Duff and Hong, 1982 Liang *et al.*, 1980; McClelland, 1982; Ward *et al.*, 1984). The discrepant findings between the quantitative and qualitative aspects of social interaction have been attributed to methodology. Single-item measures of social interaction have been used in studies which support the quantitative aspects of social activity while multi-item measures of social interaction have been used in studies which support the qualitative interpretation (Conner *et al.*, 1979; Longino and Kart, 1982).

Physical activity

Physical activity refers to the ability of the elderly to perform activities such as household duties, shopping, leisure pursuits, and other functionally-related behavior. These behaviors require (a) gross motor coordination, e.g., mobility; (b) fine motor coordination, e.g., flexibility; (c) physical strength; and, (d) stamina.

Research on the relationship between physical activity and subjective well-being can be considered with respect to three sampling paradigms: (a) random samples, (b) that subset of healthy older adults who self-select themselves for formal exercise programs, and (c) the frail elderly. The only data with a random sample is that of Stones and Kozma (in press-a), who found significant first-order relationships between happiness and household independence and homemaker components of the MUNAI, respectively; however, a significant association was obtained only on one of two longitudinal phases. With respect to older exercisers, an association has been reported, and happiness was found to increase after participation in a formal exercise program (Stacey *et al.*, in press; Stones *et al.*, in press).

The little research that is available on the frail elderly suggests that physical activity may play an important role in their subjective well-being. According

to the Comprehensive Assessment and Referral Evaluation Interview Schedule (CARE) research (Golden *et al.*, 1984; Teresi *et al.*, 1984), the Pearson *r* correlation for physical activity limitation and depression was 0.50. Most and Lawton (1982) also studied the activity of the physically impaired elderly regarding the amount of time spent on a variety of daily activities. In this study, physical impairment was indirectly assessed by the living conditions of the subject. Those elderly receiving high-intensity in-home services and those awaiting placement in long-term care institutions were judged to be more physically impaired than independent community residents and independent public housing tenants. The results showed that people with greater physical acitivty limitations experienced less enjoyment with everyday activities than the more behaviorally competent individuals. In the above two studies, "depression" and "enjoyment" suggest that physical activity may also be related to measures of subjective well-being.

Income

The measure of financial status used in most gerontological research is self-reported income. Moon (1977) pointed out that this measure of financial status may be inaccurate, especially for the elderly. Hidden economic resources exist for the elderly such as additional tax examptions, as well as reduced prices on government and privately-based services.

Larson (1978) found the relationship between income on subjective well-being to be significant but to represent only a small proportion of subjective well-being variance (i.e., 1 to 9%). These figures place the predictive ability of income on a par with most other objective predictors of subjective well-being. Recent data by Usui *et al.* (1985), however, show income as the largest predictor of subjective well-being compared to a variety of other predictors; however, the magnituge of the relationship (i.e., 10%) was similar to the upper estimate reported by Larson (1978).

Religion

The importance of religion to the subjective well-being of the elderly can be assessed in two ways. One is the frequency of religious activity involvement. This measure includes the self-reported frequency of church attendance, prayer, listening to religious programs on radio and TV, and Bible-reading

(Ainlay and Smith, 1984; Blazer and Palmore, 1976; Mindel and Vaughan, 1978).

A second measure of religious behavior is self-reported religiosity. Markides (1983) measured religiosity on a 4-point scale from very religious to not at all religious. Blazer and Palmore (1976) used the religion subscale of the Chicago Inventory of Activities and Attitudes to assess religiosity. With this subscale, subjects responded with agreement or disagreement to statements such as "religion is a great comfort to me" and "religion is the most important thing to me" (p. 83).

A problem in this area concerns the extent to which data obtained from specific religious groups generalizes to other religious groups or the general population. This problem is especially evident in studies such as that by Blazer and Palmore (1976), who conducted their research in a "Bible belt" community where religious advocacy may be highly reinforced. Another example is Ainlay and Smith's (1984) data from a population of the Mennonite faith, a religion which proclaims religiosity actively. While the results of these studies may be valid for the samples represented, they may not apply to others. Even data obtained from larger religious groups may have restricted validity. The Roman Catholic doctrine, for example, places greater emphasis on church attendance than on Bible-reading. On the other hand, Bible-reading is encouraged in most Protestant religions. As well, ethnic membership has been found to be associated with different religious practices (Markides, 1983). Future research should study the effect of religious affiliation on standardized measures of religiosity and religious behavior.

The little research available on the religious behavior/subjective well-being relationship is inconsistent. In general, religious behavior is positively and significantly related to the subjective well-being of the elderly (e.g., Blazer and Palmore, 1976; Hunsberger, 1985; Markides, 1983). Markides (1983) found that while the frequency of church attendance significantly and positively predicts life satisfaction for both Mexican-Americans and Anglos, more internal indicators of religious practice, such as self-rated religiosity and frequency of private prayer, were significant predictors only for the Anglo group. The net regression coefficients (controlled for demographic variables and health) for these significant relationships were in the range of 0.14 to 0.33. At a four-year follow-up, however, church attendance was again a significant predictor of life satisfaction for both groups, but religiosity and frequency of private prayer were not. These results indicate that church

attendance relates to life satisfaction not through spiritual fulfillment but through other aspects of religious behavior such as social activity (Markides, 1983).

Blazer and Palmore (1976), in a 17-year longitudinal study, obtained correlation coefficients between religious behavior and subjective well-being ranging from 0.13 to 0.33. These data also indicated that religious activity (i.e., church attendance, listening to church services on radio and TV, and reading religious books) declined with age but that religious attitudes were stable. This finding is directly opposed to the findings of Markides (1983). These differences may be attributable to group differences in the two studies (i.e., "Bible belt" community membership in the Blazer and Palmore, 1976, study; as opposed to Mexican-American and Anglo membership in the Markides', 1983, study). Another reason for this difference could be secular changes. Blazer and Palmore's data was obtained between 1957 and 1974. Markides obtained his data between 1976 and 1980.

Blazer and Palmore (1976) and Markides (1983) represent the major studies in which the relationship of religious behavior to subjective well-being in the elderly has been systematically studied. Their findings suggest that religious activity is related to the well-being of the elderly. The effect, however, may be due more to social activity rather than spiritual fulfillment.

Living Conditions

Housing

Several researchers (e.g., Lee and Lassey, 1980; Liang and Warfel, 1983; Onyenwoke, 1982; Sauer *et al.*, 1976) have found that much of the variance between objective housing conditions (i.e., building size) and life satisfaction is lost when the effects of other variables such as health, marital status, and income are controlled. Other influences such as the availability of social interactions (Smith and Lipman, 1972) and the age concentration of the housing environment (Hinrichsen, 1982; Lawton, Moss and Moles, 1984) have been cited as important factors in the relationship of objective housing to the subjective well-being of the elderly (Smith and Lipman, 1972). Larson (1978) concluded that the unique variance contribution of objective housing to subjective well-being in the elderly was only 1 to 4%.

Improvements in objective housing among the elderly have been found to be positively associated with stable improvements in subjective well-being (Carp, 1967; Lawton and Cohen, 1974). When the elderly experience horizontal displacements in housing, as from one institution to another, no significant changes in life satisfaction are observed (Borup, 1982). Damon (1982) argued that the extent to which housing changes are voluntary determines the degree of change in life satisfaction. Involuntary moves are viewed as being associated with a decline in subjective well-being whereas voluntary moves involve no change.

Urbanism/ruralism and institutional living

Kozma and Stones (1983a) found differences in mean happiness among 200 rural, 200 urban, and 200 institutionalized elderly. Rural elderly were found to be significantly happier than institutionalized elderly; urban elderly were not significantly different than the other two groups. Michalos *et al.* (1980) also found rural seniors to be happier than other people, both globally, as well as in five domains of life.

Marital Status

Marriage has consistently been shown to be positively related to subjective well-being in all age groups (Diener, 1984, Larson, 1978). However, the data indicate that the marital status/subjective well-being relationship is small and often not significant (Edwards and Klemmack, 1973; Sauer, 1977; Toseland and Rasch, 1979–80). Edwards and Klemmack (1973), for example, found that the zero-order correlation between marital status and life satisfaction for a group of elderly individuals decreased from a significant value of 0.14 to 0.07 (not significant) when education, income and occupation were controlled. Atchley (1975) and Morgan (1976) found that when factors such as income, mobility, and frequency of social interactions were controlled, there was no significant difference in subjective well-being between married and formerly married people.

On the basis of the above data, it would appear that marriage itself is not related to subjective well-being but that variables associated with being married are influential to one's happiness.

Gender

Medley (1976, 1980) found sex differences in the relationships between health satisfaction, financial satisfaction, satisfaction with standard of living and global measures of life satisfaction. Gender differences were again reported by Markides and Martin (1979) as well as Michalos (1982).

Liang (1982), reported no sex differences on his measures of the relationships between education, health, financial satisfaction, objective integration, subjective integration and morale (i.e., PGC). Colette (1984) obtained results similar to Liang (1982), using a sample of Australian elderly.

Based on the data presented here, the effect of gender on subjective well-being is not clear. One problem encountered in the gender/subjective well-being research is that each of the studies use different indicies of subjective well-being.

Age

Small but positive correlations (0 to 0.1) between age and subjective well-being have been reported in a review by Larson (1978). Other reviews have also found near zero correlations for both zero order and first order analyses (Herzog and Rodgers, 1981; Stock *et al.*, 1983; Usui *et al.*, 1985; Witt *et al.*, 1980).

Some findings indicate that age may relate differently to different measures of subjective well-being. Herzog and Rogers (1981), for example, found an average age/life satisfaction relationship of 0.04 compared to −0.02 for the age/happiness relationship. Differences as small as these may reflect measurement error, especially since these data were collected from a variety of different studies. Nonetheless, further reports of age differences in life satisfaction compared to happiness have come from Diener (1984). Diener suggested that young people tend to experience more intense emotions such as happiness whereas older individuals experience less intense emotions such as satisfaction.

Michalos (1982) found age differences in the kinds of predictors that most and least influenced well-being. The well-being of the young-old (65 to 74 years) was influenced most by satisfaction with spouse, friendships, and government services (in that order) and least influenced by recreation. The old-old (75 and over), on the other hand, were most influenced by friend-

ships, spouse and financial security and least influenced by family life. Additional research using longitudinal designs are required to ascertain that changes in the importance of predictors with age are not the result of cohort differences.

Race

Racial differences have been found, not with subjective well-being itself, but with the way that predictors influence subjective well-being. Ward and Kilburn (1983), for example, found that the involvement in the community was significantly related to subjective well-being for elderly whites but not for elderly blacks. This difference was attributed to whites' being more accustomed to wide community access, compared to blacks, who (due to lifelong segregation) are accustomed to more restrictive community involvement. Deimling *et al.* (1983) reported the seemingly contradictory finding that amount of social involvement was a better predictor of life satisfaction for blacks than whites. Taken together, these two studies could indicate that the subjective well-being of blacks is predicted by social interactions close to home, whereas with whites, access to community-based, rather than familial-based social relationships is more important.

The number of significant predictors of subjective well-being has been shown to differ between blacks and whites, with blacks having fewer of them (Deimling *et al.*, 1983; Sauer, 1977). Of these predictors, health has repeatedly been shown to be the strongest predictor of subjective well-being for both blacks and whites (Chatters, 1983; Sauer, 1977).

Usui *et al.* (1983) argue that the traditional method of regression analysis, where the effect of each independant variable is determined by its difference from zero, is inadequate for assessing racial differences. These researchers point out that the difference of each independent variable from zero is not as important as the difference of each independent variable from each other (i.e., black versus white).

Usui *et al.* (1983) support their argument with the result of a regression analysis of life satisfaction using 12 independent variables. Separate regression coefficients are presented for blacks and whites. Six of the independent variables of the white group are significant predictors of life satisfaction, compared to only two for blacks. One would conclude on the basis of this information alone that the determinants of life satisfaction were quite different

for blacks than for whites. However, an analysis of the difference in slopes between the white and black groups reveal that only one of the predictors represents a significant difference between races. Therefore, the most appropriate conclusion is that while independent variables predict life satisfaction for each race differently, there is little difference between races with respect to the extent to which variables predict life satisfaction (Ursui *et al.*, 1983).

Education

Very little research has investigated the effects of education on the subjective well-being of the elderly. This may be due to the usual practice of including education with income and occupational status as a measure of socioeconomic status (e.g., Larson, 1978) or of using the term socioeconomic status in place of education (e.g., Liang, 1982). Society, however, has placed much emphasis on education as a personal resource (Campbell, 1981; Campbell *et al.*, 1976, Kutner *et al.*, 1956) and it therefore warrants some individual consideration.

The research on the influence of education on subjective well-being indicates that while education has a significant zero-order correlation (e.g., $r = 0.24$; Edwards and Klemmack, 1973), it becomes insignificant when other factors are controlled (e.g., Edwards and Klemmack, 1973; Plamore, 1979; Toseland and Rasch, 1979–80; Spreitzer and Snyder, 1974). Therefore, it is not education itself that is important to the elderly's subjective well-being, but what the elderly person obtains as the result of being better educated (e.g., higher income, better housing, etc.) that is important. In contrast, Markides and Martin (1979) found that education was an important predictor of life satisfaction in males. An independent association of 0.375 was obtained for males, but only 0.06 was obtained for females. The reason for the unusually high education/subjective well-being relationship for males in this study is unclear. The authors have attributed this finding to the greater importance of education to occupational opportunities for men. Another explanation is that it is a chance occurrence and may not be replicable.

Employment

Unemployed people are not as happy as the employed (Campbell *et al.*, 1976), although this is not true for those unemployed because of retire-

ment, whose level of subjective well-being remains stable after retirement (George *et al.*, 1984; George and Maddox, 1977; Palmore, Fillenbaum, and George, 1984). Larson (1978) reported that, on the average, studies showed a positive correlation between employment and subjective well-being ($r = 0.0$ to 0.1).

Retirement

Two longitudinal studies have measured the effects of retirement on subjective well-being. George and Maddox (1977) found that mean levels of subjective well-being did not significantly differ from before to after retirement (the duration of this study was 5 years). Palmore *et al.* (1984) also found stability in subjective well-being in several longitudinal samples with an average duration of 6.33 years.

Widowhood

Some studies (e.g., Arens, 1982–83; Atchley, 1975; Hutchison, 1975; Kutner *et al.*, 1956;), have found that levels of subjective well-being are lower for widowed persons than for married persons. Morgan (1976) and Atchley (1975) found that lower subjective well-being for widows was related to the restrictive influences on mobility and social interaction caused by the lowered income that often accompanies widowhood. Hutchison's (1975) results are not in complete agreement with those of Morgan (1976) and Atchley (1975). Hutchison found that widowhood at the lowest income levels had less of an effect on subjective well-being measures compared to those at higher income levels. This finding indicates that income levels may have an important influence on subjective well-being in only some, but not all, income levels of the widowed elderly. Arens (1982–83) found that the lower subjective well-being of widows was largely a reflection of widows' older age, poorer health, and reduced social interactions. Overall, these data suggest that the effect of widowhood on subjective well-being is indirect, with its primary effect on other predictors of subjective well-being (e.g., social activity).

There is no research which measures changes in subjective well-being before and after the death of a spouse. This type of analysis (i.e., longitudinal) is needed for assessing the effect of widowhood on subjective well-being.

Personality

Several kinds of personality measures have been used to predict the variance in subjective well-being, including self-esteem, locus of control, neuroticism and extroversion. Self-esteem has been found to be a strong predictor of subjective well-being (Campbell *et al.*, 1976; Peterson, 1975; Reid and Ziegler, 1980). Reid and Ziegler (1980), for example, obtained high correlations of 0.46 and 0.61 between life satisfaction (LSI-Z) and a 10-item measure of self-esteem. However, as Diener (1984) points out, this strong relationship has not always been found. Wolk and Telleen (1976) found that their measure of self-esteem accounted for 1.64% of the variance in life satisfaction. Carp (1974) found that her measure of self-esteem accounted for 9% of the variance in well-being. Based on these discrepant estimates, nothing conclusive can be said about the extent of the contribution of self-esteem to subjective well-being. One reason for these inconsistencies is the lack of any standardized measure of self-esteem. Indeed, many researchers provide only cursory descriptions of their self-esteem measure (i.e., Carp, 1974; Reid and Ziegler, 1980; Wolk and Telleen, 1976) so that comparisions across studies are difficult. From the descriptions that are available, many components of the self-esteem measures appear to be confounded with other variables such as health, activity, or subjective well-being itself. Future research should concentrate on developing a standardized measure of self-esteem.

Locus of control (a personality dimension in which individuals attribute control of their lives to either internal or external forces) has been found to be related to subjective well-being in several studies. Most of these studies (e.g., Baker, 1977; Brandt, 1980; Felton and Kahana, 1974; Fletcher, 1982; Palmore and Luikart, 1972) indicate that internal locus of control is related to subjective well-being. However, as Diener (1984) and Kozma and Stones (1978) have pointed out, external locus of control has also been found to be positively related to subjective well-being. These authors conclude that the subjective well-being/locus of control relationship may be mediated by other characteristics of the samples studied.

Intelligence has also been studied as a predictor of subjective well-being. Palmore (1979) and Palmore and Luikart (1972) found that intelligence, as measured by the Wechsler Adult Intelligence Scale, was not a significant predictor of adjustment in the elderly.

Extroversion and neuroticism are two personality variables for which the

relationships to subjective well-being have been studied extensively. Costa and McCrae (1980) found that 2.9% and 10% of the variance in subjective well-being was accounted for by concurrent measures of extroversion and neuroticism, respectively (these figures are based on the averages of eight correlations each, with a range of 0.11 to 0.25 for extroversion and −0.27 to −0.32 for neuroticism; calculated by the present authors). Results from a lagged design (where extroversion and neuroticism were used to predict happiness 10 years later) were that 2% and 9% of the subjective well-being variance was accounted for by extroversion and neuroticism, respectively (Costa and McCrae, 1980). Costa *et al.* (1981), in lagged designs of up to 17 years using three measures of subjective well-being (i.e., a global measure of life satisfaction and of happiness and a seven-item happiness section of the Chicago Attitude Inventory), found that for a group of 50 to 97-year-olds, 2.8% and 4% of the variance in subjective well-being was accounted for by extroversion and neuroticism, respectively.

Summarizing the above data, extroversion is found to account for less than 3% and neuroticism for up to 10% of the variance of a variety of measures of subjective well-being. Extroversion and neuroticism, therefore, are similar to other predictors of subjective well-being in the amount of variance prediction. However, extroversion and neuroticism are measures of gross dimensions. As a result, influences such as age, sex, and health have not been controlled, as is the case with most other predictors. Consequently, the direct effects of neuroticism and extroversion on subjective well-being can be expected to be smaller than the gross estimates reported here.

Subjective Well-Being as a Predictor of Itself

Subjective well-being has been used in several studies as a predictor of itself at a later time. Palmore and Kivett (1977) found correlation coefficients of 0.4 and 0.56 for periods of up to 4 years for their measure of subjective well-being (i.e., the Cantrill Ladder). Mussen *et al.* (1982) obtained highly significant correlations (range 0.28 to 0.70) between indicators of life satisfaction for subjects at age 20 years and Life Satisfaction Ratings (LSR) 40 years later. Although correlations were based upon different measures of adjustment, the method of data collection (by interview) remained similar. George and Maddox (1977) found that mean levels of subjective well-being as measured by the Kutner Morale Scale did not significantly differ over a five

year interval. In addition, subjective well-being at time one explained approximately three-quarters of the explained variance at time two. Campbell *et al.* (1976), using the Index of Well-Being as a global measure of subjective well-being, found a correlation of 0.53 over a period of 8 months. Baur (1982) and Baur and Okun (1983) found life satisfaction (i.e., the LSI-B) to have a test-retest correlation coefficient of .61 in a three year longitudinal study. Kozma and Stones (1983a) found that the MUNSH was a good predictor of itself over a period of 18 months (correlation coefficient = 0.70). Using a two-year time interval, Recker and Wong (1984) obtained a correlation of 0.79 for their measure of psychological well-being. Based upon correlation coefficients reported in these studies, measures of subjective well-being account for variance estimates of up to two-thirds of their variance with test-retest intervals of months or years.

Overview of Subjective Well-Being Prediction

The prediction of subjective well-being variance by separate predictors is small. Health, the most powerful of all predictors, is capable of predicting, at most, only 16% of the subjective well-being variance. Most other objective predictors account for 1 to 10% of the subjective well-being variance. George (1978) found that the total variance of subjective well-being accounted for by a combination of objective predictors was 21.8%. This estimate is small compared to the variance contribution of subjective well-being itself (i.e., up to 63%).

GENERAL CONCLUSION

The longer term stability of subjective well-being has been found to explain more of the variance than all of its objective predictors combined. Consequently, an interpretation warrants consideration that subjective well-being scales measure a trait dimension.

Trait theory requires two psychometric features of a scale: cross-situational consistency (a characteristic is repeatedly expressed in different situations) and temporal stability (a characteristic is repeatedly expressed at different times). The data on the stability of subjective well-being has been established in several studies. Evidence for cross-situational consistency is available in the form of the convergent validity of a variety of measures of subjective well-

being. For example, cross-scale correlations have shown that subjective well-being is consistent when different measures of subjective well-being are used (e.g., Baur and Okun, 1983; Himmelfarb and Murrell, 1983; Larson, 1978; Lohmann, 1977; Neugarten *et al.*, 1961; Stock and Okun, 1982). Also, judges' ratings of subjective well-being have been found to correlate moderately well with scale measurements (e.g., Kozma and Stones, 1983b; Neugarten *et al.* 1961, Wood *et al.*, 1969). In addition, behavioral indicators of happiness (e.g. smiling, laughing, and positive self-statements) have been shown to correlate well ($r > 0.60$) with a scale of happiness (Stones and Kozma, 1980a).

The suggestion that subjective well-being is a trait is supported by four features of the data reviewed in this paper: (a) high temporal stability, (b) the evidence for the cross-situational consistency, (c) findings from the second order structural analyses of subjective well-being which support a one factor solution of subjective well-being, (d) the inability of any other objective predictor yet studied in the gerontological literature to account for any more than 16% of the variance in subjective well-being. Together, these four features of the data are best explained if subjective well-being is viewed as a trait, with its prediction being intrinsically determined, and its function changing from one of the "predicted" to "predictor".

Suggestions for Future Research

Subjective well-being has been traditionally conceptualized as predicted, determined, or "caused" by other variables (i.e., health, activity, income). If subjective well-being is a trait, then it probably predicts other variables. One example of subjective well-being as a predictor is the investigation by Gilford (1984) who found that self-rated happiness predicted positive marital social interaction (in fact, was the best predictor in three age groups of the elderly). Another example is Multiple Discrepacies Theory (Michalos, 1985) where subjective well-being is recognized as having some causal role, as represented by a looped flow diagram (Exhibit 1, p. 354).

If measures of subjective well-being predict other variables traditionally conceived of as predictors, then much of the subjective well-being research and theory is in need of revision. This need for reconceptualization applies to research employing path analysis, where measures of subjective well-being are viewed as determined unindirectionally by traditional predictors

(e.g., Liang, *et al.*, 1980; Markides and Martin, 1979; McClelland, 1982; Teresi *et al.*, 1984; Ward *et al.*, 1984).

The only study to test between a trait model of happiness (Model 1) and a traditional formulation, wherein happiness is a function of predictor variables (Model 2), is that reported by Stones and Kozma (in press-b). The trait formulation in Model 1 assumes that happiness exerts a causal influence on other variables within each of two longitudinal phases and is stable over time. Model 2 assumes that the predictor variables exert a causal influence on happiness within phases, and that any stability to happiness is a secondary consequence of stabilities within the predictor array. The predictors were housing satisfaction, financial satisfaction, perceived health, locus of control,

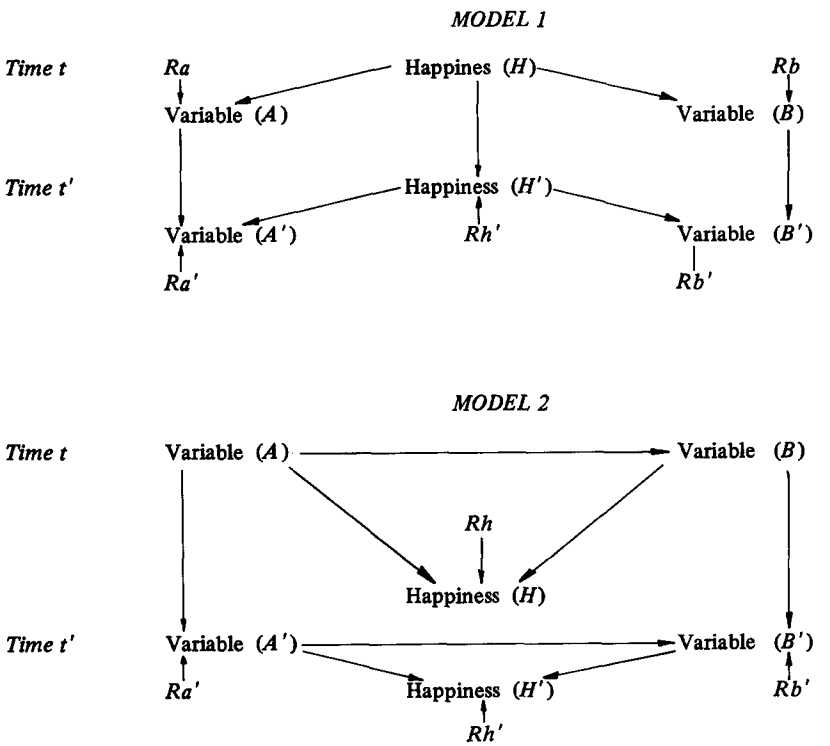

Fig. 1 Schematic representation of the two models.

and activity level. The data were obtained from an 18-month longitudinal study of 408 elderly subjects. The models were compared using the Simon-Blalock technique to test for direct and indirect causal linkages. The findings supported Model 1 over Model 2 on 17 out of 18 predictions that differentiated the models; consequently, strong support is obtained for a trait model of happiness over the traditional formulation.

In conclusion, it may be that an important aspect of a trait is a predisposition to interpret stimuli in particular ways (i.e., a cognitive style) and to then behave accordingly. Applied to subjective well-being, people who are happy, are so because they interpret events and other stimuli in particular ways, and they do this consistently (Stones and Kozma, 1980b). Future research aimed at improving the subjective well-being of the elderly might be directed at changing "unhappy" cognitive styles into "happier" ones rather than concentrating efforts solely on improving the elderly's environment.

REFERENCES

Adams, D.: 1968, 'Analysis of a life satisfaction index', Journal of Gerontology 24, pp. 470–474.

Ainlay, S. C. and D. R. Smith: 1984, 'Aging and religious participation', Journal of Gerontology 39, pp. 357–363.

Andrews, F. M. and S. B. Withey: 1976, Social Indicators of Well-Being: Americans' Perceptions of Life Quality (Plenum, New York).

Antonucci, T.: 1974, 'On the relationship between values and adjustment in old men', International Journal of Aging and Human Development 5, pp. 57–69.

Arens, D. A.: 1982–83, 'Widowhood and well-being: An examination of sex differences within a causal model', International Journal of Aging and Human Development 15, pp. 27–40.

Atchley, R. C.: 1971, 'Retirement and work orientation', The Gerontologist 11, pp. 29–32.

Atchley, R. C.: 1975, 'Adjustment to loss of job at retirement', International Journal of Aging and Human Development 6, pp. 17–27.

Baker, E. K.: 1977, 'Relationship of retirement and satisfaction with life events to locus-of-control', Dissertation Abstracts International 37, 4748B (University Microfilms No. 76–28, 900).

Baur, P. A.: 1982, 'Changes in life satisfaction among "old-old" noninstitutionalized persons', Dissertation Abstracts International 42, 4247A (University Microfilms No. 82–06, 867).

Baur, P. A. and M. A. Okun: 1983, 'Stability of life satisfaction in late life', The Gerontologist 23, pp. 261–265.

Beiser, M.: 1974, 'Components and correlates of mental well-being', Journal of Health and Social Behavior 15, pp. 320–327.

Bigot, A.: 1974, 'The relevance of American life satisfaction indices for research on British subjects before and after retirement', Age and Aging 3, pp. 113–121.

Bild, B. R. and R. J. Havighurst: 1976, 'Life satisfaction', The Gerontologist 16, pp. 70–75.

Blazer, D. and E. Palmore: 1976, 'Religion and aging in a longitudinal panel', The Gerontologist 16, pp. 82–85.
Borup, J. H.: 1982, 'The effects of varying degrees of interinstitutional environmental change in long-term care patients', The Gerontologist 22, pp. 409–417.
Bradburn, N. M.: 1969, The Structure of Psychological Well-Being (Aldine, Chicago).
Brandt, A. S.: 1980, 'Relationship of locus of control, environmental constraint, length of time in the institution and twenty-one other variables to morale and life satisfaction in the institutionalized elderly', Dissertation Abstracts International 40, 5802B (University Microfilms No. 80–12, 153).
Brenner, B.: 1975, 'Enjoyment as a preventive of depressive affect', Journal of Community Psychology 3, pp. 346–357.
Britton, J. H.: 1963, 'Dimensions of adjustment of older adults', Journal of Gerontology 18, pp. 60–65.
Britton, J. H. and W. G. Mather: 1958, 'Factors in criterion measures of adjustment of older adults', Journal of Gerontology 13, p. 445.
Bryant, F. B. and J. Veroff: 1982, 'The structure of psychological well-being: a sociohistorical analysis', Journal of Personality and Social Psychology 43, pp. 653–673.
Campbell, A.: 1981, The Sense of Well-Being in America: Recent Patterns and Trends (McGraw-Hill, New York).
Campbell, A., P. E. Converse, and W. L. Rogers: 1976, The Quality of American Life (Russell Sage, New York).
Cantril, H.: 1965, The Pattern of Human Concerns (Rutgers, New Brunswick, NJ).
Carp, F. M.: 1967, 'The impact of environment on old people', The Gerontologist 7, pp. 106–108.
Carp, F. M.: 1974, 'Short-term and long-term prediction of adjustment to a new environment', Journal of Gerontology 29, pp. 444–453.
Carp, F. M. and A. Carp: 1982a, 'Perceived environmental quality of assessment scales and their relation to age and gender', Journal of Environmental Psychology 2, pp. 295–313.
Carp, F. M. and A. Carp: 1983, 'Structural stability of well-being factors across age and gender, and development of scales of well-being unbaised for age and gender', Journal of Gerontology 38, pp. 572–581.
Cavan, R. S., E. W. Burgess, R. J. Havighurst, and H. Goldhamer: 1949, Personal Adjustment in Old Age (Science Research Associates, Chicago).
Chatters, L. M.: 1983, 'A causal analysis of subjective well-being among elderly blacks', Dissertation Abstracts International 44, 622B (University Microfilms No. 83–14, 251).
Chelsvig, K. A.: 1983, 'Family interaction patterns and life satisfaction among the elderly: A policy analysis', Dissertation Abstracts International 44, 1216A (University Microfilms No. 83–18, 879).
Cherlin, A. and L. G. Reeder: 1975, 'The dimensions of psychological well-being: A critical review', Sociological Methods and Research 4, pp. 189–214.
Collette, J.: 1984, 'Sex differences in life satisfaction: Australian data', Journal of Gerontology 39, pp. 243–245.
Conner, K. A. and E. A. Powers: 1975, 'Structural effects and life satisfactions among the aged', International Journal of Aging and Human Development 6, pp. 321–327.
Conner, K. A., E. A. Powers, and G. L. Bultena: 1979, 'Social interaction and life satisfaction: An empirical assessment', Journal of Gerontology 34, pp. 116–121.
Costa, P. T. and R. R. McCrae: 1980, 'Influence of extraversion and neuroticism on subjective well-being: Happy and unhappy people', Journal of Personality and Social Psychology 38, pp. 668–678.
Costa, P. T., R. R. McCrae, and A. H. Norris: 1981, 'Personal adjustment to aging:

Longitudinal prediction from neuroticism and extraversion', Journal of Gerontology 36, pp. 78–85.
Cumming, E., R. Dean, and D. S. Newell: 1958, 'What is "morale"? A case history of a validity problem', Human Organization 17, pp. 3–8.
Damon, L. E.: 1982, 'Effects of relocation on the elderly', American Family Physician 26, pp. 144–148.
Davidson, W. B. and P. R. Cotter: 1982, 'Adjustment to aging and relationships with offspring', Psychological Reports 50, pp. 731–738.
Deimling, G., Z. Harel, and L. Noelker: 1983, 'Racial differences in social integration and life satisfaction among aged public housing residents', International Journal of Aging and Human Development 17, pp. 203–212.
DeMellier, M. F.: 1982, 'Intimate friendships and adaptation to life stress in older adult females', Dissertation Abstracts International 42, 4221B (University Microfilms No. 82–07, 173).
Diener, E.: 1984, 'Subjective well-being', Psychological Bulletin 95, pp. 542–575.
Diener, E. and R. A. Emmons: 1984, 'The independence of positive and negative affect', Journal of Personality and Social Psychology 47, pp. 1105–1117.
Diener, E., R. Emmons, R. Larsen, and S. Griffin: 1983, 'The satisfaction with life scale', Unpublished manuscript, University of Illinois at Urbana-Champaign.
Dobson, C., E. A. Powers, P. A. Keith, and W. J. Goudy: 1979, 'Anomia, self-esteem, and life satisfaction: Interrelationships among three scales of well-being', Journal of Gerontology 34, pp. 569–572.
Dressler, D. M.: 1973, 'Life adjustment of retired couples', International Journal of Aging and Human Development 4, 335–349.
Duff, R. W. and L. K. Hong: 1982, 'Quality and quantity of social interactions in the life satisfaction of older Americans', Sociology and Social Research 66, pp. 418–434.
Edwards, J. N. and D. L. Klemmack: 1973, 'Correlates of life satisfaction: A re-examination', Journal of Gerontology 28, pp. 497–502.
Felton, B. and E. Kahana: 1974, 'Adjustment and situationally bound locus of control among institutionalized aged', Journal of Gerontology 29, pp. 295–301.
Fengler, A. P., V. C. Little, and N. L. Danigelis: 1983, 'Correlates and dimensions of happiness in urban and nonurban settings', International Journal of Aging and Human Development 16, pp. 53–65.
Fletcher, S.: 1982, 'An investigation of the relationship of locus of control and social opportunity to life satisfaction and purpose among elderly women', Dissertation Abstracta International 42, 4744B (University Microfilms No. 82–10, 915).
Gehrmann, F.: 1978, '"Valid" empirical measurement of quality of life?', Social Indicators Research 5, 73–109.
George, L. K.: 1978, 'The impact of personality and social status factors upon levels of activity and psychological well-being', Journal of Gerontology 33, pp. 840–847.
George, L. K.: 1979, 'The happiness syndrome: Methodological and substantive issues in the study of social-psychological well-being in adulthood', The Gerontologist 19, pp. 211–216.
George, L. K. and L. B. Bearon: 1980, Quality of life in older persons: Meaning and measurement (Human Science, New York).
George, L. K., G. G. Fillenbaum, and E. Palmore: 1984, 'Sex differences in the antecedents and consequences of retirement', Journal of Gerontology 39, pp. 364–371.
George, L. K. and R. Landerman: 1984, 'Health and subjective well-being: A replicated secondary analysis', International Journal of Aging and Human Development 19, pp. 133–156.
George, L. K. and G. L. Maddox: 1977, 'Subjective adaptation to loss of the work role: A longitudinal study', Journal of Gerontology 32, pp. 456–462.

Gilford, R.: 1984, 'Contrasts in marital satisfaction throughout old age: An exchange theory analysis', Journal of Gerontology 39, pp. 325–333.
Gilleard, W.: 1981, 'Self-report measures of mood and morale in elderly depressives', British Journal of Psychiatry 138, 230–235.
Golden, R. R., J. A. Teresi, and B. J. Gurland: 1984, 'Development of indicator scales for the comprehensive assessment and referral evaluation (CARE)', Journal of Gerontology 39, pp. 138–146.
Graney, M. J.: 1975, 'Happiness and social participation in aging', Journal of Gerontology 30, pp. 701–706.
Graney, M. J. and E. E. Graney: 1973, 'Scaling adjustment in older people', International Journal of Aging and Human Development 4, pp. 351–359.
Guldin, D. A.: 1976, 'The measurement of life satisfaction among older persons', Dissertation Abstracts International 43, 5365A (University Microfilms No. 77–24, 07).
Herzog, A. R. and W. L. Rogers: 1981, Age and satisfaction: Data from several large surveys', Research on Aging 3, pp. 142–165.
Himmelfarb, S. and S. A. Murell: 1983, 'Reliability and validity of five mental health scales in older persons', Journal of Gerontology 38, pp. 333–339.
Hinrichsen, G. A.: 1982, 'The impact of age-concentrated, publically-assisted housing on older people's social and emotional well-being', Dissertation Abstracts International 43, 3774B (University Microfilms No. 83–07, 830).
Hoyt, D. R. and J. C. Creech: 1983, 'The life satisfaction index: A methodological and theoretical critique', Journal of Gerontology 38, pp. 111–116.
Hunsberger, B.: 1985, 'Religion, age, life satisfaction, and perceived sources of religiousness: A study of older persons', Journal of Gerontology 40, 615–620.
Hutchison, I., III.: 1975, 'The significance of marital status for morale and life satisfaction among lower income elderly', Journal of Marriage and the Family 37, pp. 287–293.
Kammann, R., M. Farry, and P. Herbison: 1984, 'The analysis and measurement of happiness as a sense of well-being', Social Indicators Research 15, pp. 91–115.
Klemmack, D. L., J. R. Carlson, and J. N. Edwards: 1974, 'Measures of well-being: An empirical and critical assessment', Journal of Health and Social Behavior 15, pp. 267–270.
Kozma, A. and M. J. Stones: 1978, 'Some research issues in the assessment of well-being in the elderly', Canadian Psychological Review 19, pp. 241–249.
Kozma, A. and M. J. Stones: 1980, 'The measurement of happiness: Development of the Memorial University of Newfoundland Scale of Happiness (MUNSH)', Journal of Gerontology 35, pp. 906–912.
Kozma, A. and M. J. Stones: 1983a, 'Predictors of happiness', Journal of Gerontology 38, pp. 626–628.
Kozma, A. and M. J. Stones: 1983b, 'Re-validation of the Memorial University of Newfoundland Scale of Happiness', Canadian Journal on Aging 2, pp. 27–29.
Kozma, A., M. J. Stones, and S. Kazarian: 1985, 'The potential usefulness of the MUNSH as a measure of psychopathology', Social Indicators Research 17, pp. 49–57.
Kuhlen, R. G.: 1948, 'Age trends in adjustment during the adult years as reflected in happiness ratings', American Psychologist 3, pp. 307.
Kutner, B., D. Fanshel, A. M. Togo, and T. S. Langer: 1956, Five Hundred Over Sixty (Russell Sage, New York).
Larson, R.: 1978, 'Thirty years of research on the subjective well-being of older Americans', Journal of Gerontology 33, pp. 109–125.
Lawton, M. P.: 1972, 'The dimensions of morale', in Research Planning and Action for the Elderly: The Power and Potential of Social Science, ed. by D. P. Kent, R. Kastenbaum, and S. Sherwood (Behavioral Publications, New York).

Lawton, M. P.: 1975, 'The Philadelphia Geriatric Centre Morale Scale: A revision', Journal of Gerontology 30, pp. 85–89.
Lawton, M. P.: 1983, 'The varieties of well-being', Experimental Aging Research 9, pp. 65–72.
Lawton, M. P.: 1984, 'Investigating health and subjective well-being: Substantive challenges', International Journal of Aging and Human Development 19, pp. 157–166.
Lawton, M. P. and J. Cohen: 1974, 'The generality of housing impact on the well-being of older people', Journal of Gerontology 29, pp. 194–204.
Lawton, M. P., M. H. Kleban, and E. di Carlo: 1984, 'Psychological well-being in the aged', Research on Aging 6, pp. 67–97.
Lawton, M. P., M. Moss, and E. Moles: 1984, 'The suprapersonal neighbourhood context of older people: Age heterogeneity and well-being', Environment and Behavior 16, pp. 89–109.
Lee, G. R. and M. L. Lassey: 1980, 'Rural-urban differences among the elderly: Economic, social and subjective factors', Journal of Social Issues 36, pp. 62–74.
Lemon, B. W., V. L. Bengston, and J. A. Peterson: 1972, 'An exploration of the activity theory of aging: Activity types and life satisfaction among in-movers to a retirement community', Journal of Gerontology 27, 511–523.
Lepkowski, J. R.: 1956, 'The attitudes and adjustments of institutionalized and non-institutionalized Catholic aged', Journal of Gerontology 11, pp. 185–191.
Levy, S. and L. Guttman: 1975, 'On the multivariate structure of wellbeing', Social Indicators Research 2, pp. 361–388.
Liang, J.: 1982, 'Sex differences in life satisfaction among the elderly', Journal of Gerontology 37, pp. 100–108.
Liang, J.: 1984, 'Dimensions of the life satisfaction index A: A structural formulation', Journal of Gerontology 39, pp. 613–622.
Liang, J.: 1985, 'A structural integration of the Affect Balance Scale and Life Satisfaction Index A, Journal of Gerontology 40, pp. 552–561.
Liang, J. and K. A. Bollen: 1983, 'The structure of the Philadelphia Geriatric Center Morale Scale: A reinterpretation', Journal of Gerontology 38, pp. 181–189.
Liang, J., L. Dvorkin, E. Kahana, and F. Mazian: 1980, 'Social integration and morale: A re-examination', Journal of Gerontology 35, pp. 746–757.
Liang, J. and B. L. Warfel: 1983, 'Urbanism and life satisfaction among the aged', Journal of Gerontology 38, pp. 97–106.
Lieberman, M. A.: 1975, 'Adaptive processes in late life', in Life-Span Developmental Psychology: Normative Life Crisis, ed. by N. Datan and L. H. Ginsberg (Academic Press, New York).
Loeb, M.: 1975, 'Adaptation and survival: New Meanings in old age', in Life-Span Developmental Psychology: Normative Life Crises, ed. by N. Datan and L. H. Ginsberg (Academic Press, New York).
Lohmann, N.: 1977, 'Correlations of life satisfaction, morale and adjustment measures', Journal of Gerontology 32, pp. 73–75.
Lohmann, N.: 1980, 'A factor analysis of the life satisfaction, adjustment and morale measures with elderly adults', International Journal of Aging and Human Development 11, pp. 35–43.
Longino, C. F., Jr. and C. S. Kart: 1982, 'Explicating activity theory: A formal replication', Journal of Gerontology 37, pp. 713–722.
Lowenthal, M. and C. Haven: 1968, 'Interaction and adaptation: Intimacy as a critical variable', in Middle Age and Aging, ed. by B. Neugarten (University of Chicago, Chicago).
Lowenthal, M. F., M. Thurner, and D. Chiriboga: 1975, Four Stages of Life (Jossey-Bass, San Francisco).

Markides, K. S.: 1983, 'Aging, religiosity, and adjustment: A longitudinal analysis', Journal of Gerontology 38, pp. 621–625.
Markides, K. S. and H. W. Martin: 1979, 'A causal model of life satisfaction among the elderly', Journal of Gerontology 34, pp. 86–93.
McClelland, K. A.: 1982, 'Self-conception and life satisfaction: Integrating aged subculture and activity theory', Journal of Gerontology 37, pp. 723–732.
Medley, M. L.: 1976, 'Satisfaction with life among persons sixty-five years and older', Journal of Gerontology 31, pp. 448–455.
Medley, M. L.: 1980, 'Life satisfaction across four stages of adult life', International Journal of Aging and Human Development 11, pp. 193–209.
Michalos, A. C.: 1980, 'Satisfaction and happiness', Social Indicators Research 8, pp. 507–510.
Michalos, A. C.: 1982, 'The satisfaction and happiness of some senior citizens in rural Ontario', Social Indicators Research 11, pp. 1–30.
Michalos, A. C.: 1985, 'Multiple discrepancies theory', Social Indicators Research 11, pp. 348–413.
Michalos, A. C., A. Fuller, J. Mage, A. Martin Matthews, and L. Wood: 1980, Towards an Understanding of the Rural Elderly (Ontario Advisory Council on Senior Citizens, Toronto).
Mindel, C. H. and E. E. Vaughn: 1978, 'A multidimensional approach to religiosity and disengagement', Journal of Gerontology 33, pp. 103–108.
Moon, M.: 1977, The Measurement of Economic Welfare: Its Application to the Aged Poor (Academic Press, New York).
Morgan, L.: 1976, 'A re-examination of widowhood and morale', Journal of Gerontology 31, pp. 687–695.
Moriwaki, S. Y.: 1974, 'The Affect Balance Scale: A validity study with aged samples', Journal of Gerontology, 29, pp. 73–78.
Morris, J. N. and S. Sherwood: 1975, 'A retesting and modification of the Philadelphia Geriatric Center Morale Scale', Journal of Gerontology 30, pp. 77–84.
Moss, M. S. and M. P. Lawton: 1982, 'Time budgets of older people: A window on four lifestyles', Journal of Gerontology 37, pp. 115–123.
Mussen, P., M. P. Honzik, and D. H. Eichorn: 1982, 'Early adult antecedents of life satisfaction at age 70', Journal of Gerontology 37, pp. 316–322.
Neugarten, B. L., R. J. Havighurst, and S. S. Tobin: 1961, 'The measurement of life satisfaction', Journal of Gerontology 16, pp. 134–143.
Okun, M. A., W. A. Stock, M. J. Haring, and R. A. Witter: 1984a, 'Health and subjective well-being: A meta-analysis', International Journal of Aging and Human Development 19, pp. 111–132.
Okun, M. A., W. A. Stock, M. J. Haring, and R. A. Witter: 1984b, 'The social activity/subjective well-being relation: A quantitative synthesis', Research on Aging 6, pp. 45–66.
Onyenwoke, N. O.: 1982, 'Urban developments and quality of life of the elderly', Dissertation Abstracts International 43, 3717A. (University Microfilm No. 83–06, 349).
Owens, D. J.: 1982, 'The relationship of frequency and types of activity to life satisfaction in elderly deaf people', Dissertation Abstracts International 42, 3110A (University Microfilms No. 81–28, 225).
Palmore, E.: 1979, 'Predictors of successful aging', The Gerontologist 19, pp. 427–431.
Palmore, E., W. P. Cleveland, J. B. Nowlin, D. Ramm, and I. C. Siegler: 1979, 'Stress and adaptation in later life', Journal of Gerontology 34, pp. 841–851.
Palmore, E. B., G. G. Fillenbaum, and L. K. George: 1984, 'Consequences of retirement', Journal of Gerontology 39, pp. 109–116.

Palmore, E. and V. Kivett: 1977, 'Change in life satisfaction: A longitudinal study of persons aged 46–70', Journal of Gerontology 32, pp. 311–316.
Palmore, E. and C. Luikart: 1972, 'Health and social factors related to life satisfaction', Journal of Health and Social Behavior 13, pp. 68–80.
Pan, J. S.: 1948, 'A study of the influence of institutionalization on the social adjustment of old people', Journal of Gerontology 3, pp. 276–280.
Pearlin, L. I. and C. Schooler: 1978, 'The structure of coping', Journal of Health and Social Behavior 19, pp. 2–21.
Peterson, J. L.: 1975, 'Personality effects of self-esteem, need motivation, and locus of control on the life satisfaction of older black adults', Dissertation Abstracts International 35, 5700B (University Microfilms No. 75–10, 256).
Philblad, C. and D. Adams: 1972, 'Widowhood, social participation and life satisfaction', Journal of Aging and Human Development 3, pp. 323–330.
Pierce, R. C., and M. M. Clark: 1973, 'Measurement of morale in the elderly', International Journal of Aging and Human Development 4, pp. 83–101.
Reid, D. W. and M. Ziegler: 1980, 'Validity and stability of a new desired control measure pertaining to psychological adjustment of the elderly', Journal of Gerontology 35, pp. 395–402.
Recker, G. T. and P. T. P. Wong: 1984, 'Psychological and physical well-being in the elderly: The Perceived Well-Being Scale (PWB)', Canadian Journal on Aging 3, pp. 23–32.
Rosow, I.: 1977, 'Morale: Concept and measurement', in Morale: A Guide to Effective Assessment, ed. by C. Nydegger (Gerontological Society, Washington, D.C.).
Sauer, W.: 1977, 'Morale of the urban aged: A regression analysis by race', Journal of Gerontology 32, pp. 600–608.
Sauer, W., C. Shehan, and C. Baymel: 1976, 'Rural-urban differences in satisfaction among the elderly: A reconsideration', Rural Sociology, 41, pp. 269–275.
Schooler, K. K.: 1970, 'Effect of environment on morale', The Gerontologist 10, pp. 194–197.
Schooler, K., T. Pastorello, A. Comen, and C. Clark: 1981, 'The relative impact of objective social integration on morale: A replication', The Gerontologist 21, p. 292.
Shin, D. C. and D. M. Johnson: 1978, 'Avowed happiness as an overall assessment of quality of life', Social Indicators Research 5, pp. 475–492.
Smith, K., and A. Lipman: 1972, 'Constraint and life satisfaction', Journal of Gerontology 27, 77–82.
Spreitzer, E. and E. E. Snyder: 1974, 'Correlates of life satisfaction among the aged', Journal of Gerontology 29, pp. 454–458.
Stacey, C., A. Kozma, and M. J. Stones: in press, 'Simple cognitive and behavioral changes resulting from improved physical fitness in persons over 50 years of age', Canadian Journal on Aging.
Stock, W. A. and M. A. Okun: 1982, 'The construct validity of life satisfaction among the elderly', Journal of Gerontology 37, pp. 625–627.
Stock, W., M. A. Okun, M. J. Haring, and R. A. Witter: 1983, 'Age and subjective well-being: A meta-analysis', in Evaluation Studies: Review Annual, Vol. 8, ed. by R. J. Light (Sage, Beverly Hills).
Stokes, R. G. and G. L. Maddox: 1967, 'Some social factors of retirement adaptation', Journal of Gerontology 22, pp. 329–333.
Stones, M. J. and A. Kozma: 1980a, Behavioral Validation of Happiness. Paper presented at the ninth annual Canadian Association on Gerontology meeting, Saskatoon, Canada.
Stones, M. J. and A. Kozma: 1980b, 'Issues relating to the usage and conceptualization of mental health constructs employed by psychologists', International Journal of Aging and Human Development 11, pp. 269–281.

Stones, M. J. and A. Kozma: 1985, 'Structural relationships among happiness scales: A second order factorial study', Social Indicators Research 17, pp. 19–28.
Stones, M. J. and A. Kozma: in press-a, 'Happiness and activities as propensities', Journal of Gerontology.
Stones, M. J. and A. Kozma: in press-b, 'Happy are those who are happy: A test between two causal models of relationships between happiness and its correlates', Experimental Aging Research.
Stones, M. J., A. Kozma, and L. Stones: in press, 'Preliminary findings on the effects of exercise program participation in older adults', Canadian Journal of Public Health.
Teresi, J. A., R. R. Golden, B. J. Gurland, D. E. Wilder, and R. G. Bennett: 1984, 'Construct validity of indicator scales developed from the comprehensive assessment and referral evaluation interview schedule', Journal of Gerontology 39, pp. 147–157.
Thompson, W. E.: 1958, 'Pre-retirement anticipation and adjustment in retirement', Journal of Social Issues 14, pp. 35–45.
Tobin, S. and B. Neugarten: 1961, 'Life satisfaction and social interaction in the aging', Journal of Gerontology 16, pp. 344–346.
Toseland, R. and J. Rasch: (1979–80). Correlates of life satisfaction: An AID analysis', International Journal of Aging and Human Development 10, pp. 203–211.
Usui, W. M., T. J. Keil, and K. R. Durig: 1985, 'Socioeconomic comparisons and late life satisfaction of elderly adults', Journal of Gerontology 40, pp. 110–114.
Usui, W. M., T. J. Keil, and D. C. Phillips: 1983, 'Determinants of life satisfaction: A note on a race-interaction hypothesis', Journal of Gerontology 38, pp. 107–110.
Ward, R. A. and H. Kilburn: 1983, 'Community access and satisfaction: Racial differences in later life', International Journal of Aging and Human Development 16, pp. 209–219.
Ward, R. A., S. R. Sherman, and M. LaGory: 1984, 'Subjective network assessments and subjective well-being', Journal of Gerontology 39, pp. 93–101.
Warr, P.: 1978, 'A study of psychological well-being', British Journal of Psychology 69, pp. 111–121.
Warr, P., J. Barter, and G. Brownbridge: 1983, 'On the independence of negative and positive affect', Journal of Personality and Social Psychology 44, pp. 644–651.
Warr, P., J. Cook, and T. Wall: 1979, 'Scales for the measurement of some work attitudes and aspects of psychological well-being', Journal of Occupational Psychology 52, pp. 129–148.
Wilson, G. A., J. W. Elias, and L. J. Brownlee: 1985, 'Factor invariance and the Life Satisfaction Index', Journal of Gerontology 40, 344–346.
Wilson, W. R.: 1967, 'Correlates of avowed happiness', Psychological Bulletin 67, pp. 294–306.
Witt, D. D., G. D. Lowe, C. W. Peek, and E. W. Curry: 1980, 'The changing association between age and happiness: Emerging trend or methodological artifact?, Social Forces 58, pp. 1302–1307.
Wolk, S., and S. Telleen: 1976, 'Psychological and social correlates of life satisfaction as a function of residential constraint', Journal of Gerontology 31, pp. 89–98.
Wood, V., M. L. Wyle, and B. Sheafer: 1969, 'An analysis of a short self-report measure of life satisfaction: Correlation with rather judgements', Journal of Gerontology 24, pp. 465–469.
Zautra, A. and A. Hempel: 1984, 'Subjective well-being and physical health: A narrative literature review with suggestions for future research', International Journal of Aging and Human Development 19, pp. 95–110.

Gerontology Centre, Department of Psychology,
Memorial University of Newfoundland,
St. John's, Newfoundland, Canada, A1B 3X9.