ALBERT KOZMA, ROBERTO DI FAZIO, M. J. STONES AND T. E. HANNAH

LONG- AND SHORT-TERM AFFECTIVE STATES IN HAPPINESS: AGE AND SEX COMPARISONS[1,2]

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ABSTRACT. Data from 690 persons in three adult age groups were used to evaluate the generality of a componential model of happiness (Kozma *et al.*, 1990). The model postulates that long- and short-term affective states combine in an additive manner to produce current happiness. The short-term components should be more susceptible to environmental manipulation than the long-term ones and should change more readily with an appropriate experimental manipulation. Subscales of the Memorial University Mood Scale (MUMS) were used to assess short-term affect while the experience subscales of the Memorial University of Newfoundland Scale of Happiness (MUNSH) and Diener's Long-term Satisfaction Scale were used to measure long-term affect. Overall current happiness was assessed by a seven-point avowed happiness rating scale. The Velten mood induction procedure was used to manipulate current affective state. In five of six comparisons, changes on short-term components were significantly greater than on long-term components. Age differences in reactivity to mood induction emerged only when a negative induction procedure was followed by a positive one. Under these conditions, the youngest cohort responded more consistently than the oldest cohort. An additive model, based on long- and short-term affect, age, and sex produced the best explanation for current happiness.

Subjective well-being, in the form of the happiness construct, has been viewed both as a propensity or disposition (Costa and McCrea, 1984; Kozma and Stones, 1983a; Kozma *et al.*, 1990; Stones and Kozma, 1986a, b, 1989) and as a temporary affective state (Bradburn and Caplovitz, 1965; Diener, 1984). However, with a few exceptions (Diener, 1984; Kozma and Stones, 1980), there has been little effort to combine short- and long-term affective states into a general well-being construct until the last few years (Kozma, 1986, 1991; Kozma, Stones and McNeil, 1991; Kozma *et al.*, 1990; Stones and Kozma, 1991a, b; Yardley and Rice, 1991).

A simple model of well-being for incorporating such states into such a single construct was first proposed by us six years ago (Kozma, 1986). Unfortunately, it was not until 1990 that we developed an experimental paradigm for separating the postulated components (Kozma *et al.*, 1990).

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The model has the following general form:

$$\text{Happiness} = (PA_s - NA_s) + (PA_l - NA_l) + (E_s + E_l) \qquad (1)$$

where PA and NA refer to positive and negative affect, E represents measurement error and s and l indicate short- and long-term measures. The addition of a vigour (VIG) measure to the short-term components adds an additional 4 to 5 percent to the amount of variance in happiness scores explained by the components (Kozma, 1991). The basic linear model, therefore, is better represented by the following form:

$$\text{Happiness} = (PA_s - NA_s + VIG_s) + \\ + (PA_l - NA_l) + (E_s + E_l) \qquad (2)$$

Since then, several papers have appeared in which the advantages of such an approach for an explanation of overall well-being have been illustrated (Kozma *et al.*, 1991; Stones and Kozma, 1991a, b; Yardley and Rice, 1991). However, the narrow population range described in these studies has made it impossible to evaluate the general applicability of the model.

The first concern of the current investigation, therefore, was with extending the findings to community samples covering the adult life span. The specific issue addressed is whether the general model holds for men and women of different ages, or whether separate age and sex parameters for long- and short-term components will improve prediction of current well-being. Even if age and sex differences are documented on general measures of well-being, these differences could already be reflected in cohort specific performance on components of the construct. If such were the case, there would be no need for specific age and sex parameters for components.

The second concern of this paper is with the nature of the proposed model. The model retains Bradburn's (1969) affect balance approach, although vigour and two long-term components have been added to Bradburn's two short-term components. The formulation is still a simple linear one. Other formulations, such as the inclusion of an interaction term for long- and short-term components, or a simple weighted components approach (as opposed to a net components) may be a better way to express the well-being/components relationship.

To answer these questions, two sets of data are necessary. First, it needs to be established if age and sex differences in long- and short-term affective states exist under neutral or normal conditions. Baseline, or pre-induction, data on long- and short-term components and a general measure of well-being for men and women in three age groups will provide such information. Second, information is required on the relative reactivity of men and women in different age groups to environmental factors. Reactivity should be limited to the short-term components of the well-being construct (Kozma *et al.*, 1990). Specifically, we were concerned with the relative performance of three age cohorts on long- and short-term affect measures during baseline, the performance of these groups on the same measures following a mood induction procedure, and the extent to which performance on components could account for current well-being within our general model.

METHOD

Subjects

The subject sample consisted of over 600 people between 20 and 75 years of age. Working individuals were recruited from business and public occupation groups. Retired subjects were selected from our panel of elderly persons similar in socioeconomic status to our working sample. Table I represents the age and sex distribution for the participants. Only young males were over-sampled by our procedure.

Measures

Overall happiness was assessed by the MUNSH (Kozma and Stones, 1980). Long-term affect was measured by the positive (PE) and negative (NE) experience subscales of the MUNSH and the Diener long-term satisfaction scale (DIEN) (Diener *et al.*, 1985). Short-term affect and vigour were evaluated by the three subscales of the MUMS: Positive Affect (PA), Negative Affect (NA) and Vigour (VIG) (McNeil, 1987). In addition, seven point ratings were used to assess: (i) Happiness at this moment in time (AVHNOW), (ii) happiness over the past 30 days (AVH30), and (iii) happiness in general (AVHGEN).

TABLE I
Age and sex distributions per treatment condition

Induction	Age group	Sex	Music Mean age	Music No. of persons	No music Mean age	No music No. of persons
Positive	Young	M	29.0	59	30.1	61
		F	29.0	26	28.7	26
	Middle-Aged	M	48.1	29.	47.7	22
		F	50.1	25	49.0	25
	Old	M	68.7	22	66.2	18
		F	67.6	20	68.4	26
Negative	Young	M	28.9	57	28.7	51
		F	28.7	28	28.5	25
	Middle-Aged	M	48.0	26	49.3	28
		F	48.9	24	49.5	22
	Old	M	66.7	17	67.0	16
		F	69.8	17	69.9	21

Order of presentation for the four types of measures was counterbalanced.

Procedure

Subjects within each age and sex subgroup were randomly assigned to one of four mood induction conditions: positive Velten statements (Velten, 1968), positive background music; negative Velten statements, negative background music; positive Velten statements without music; and negative Velten statements without music. Some of the Velten statements were modified to make them appropriate for all age groups (e.g., the youth oriented term 'parents' was replaced by the more general term 'family') and hedonic effects of music pieces were ascertained in a pilot study.

Prior to the mood induction procedure, subjects were presented with one of 24 orders of the four types of measures. For subjects in the negative induction condition, a positive induction procedure was added to ensure that no one left the study overly depressed. The test battery was administered after every phase.

RESULTS

Overall happiness in the pre-induction phase was assessed by the MUNSH. Significance level was set at 0.01 to offset the large sample size and limit type I error. The 3(age) × 2(sex) × 2(induction) × 2(music) ANOVA procedure only yielded a significant age effect ($F(2\,657) = 15.53$; $p < 0.01$). Mean MUNSH values for young, middle-aged and old cohorts were 14.40, 14.25 and 17.99. Critical Newman-Keuls values at the selected significance level for rank-ordered means two and three steps apart were 1.98 and 2.25, respectively. Thus, the only significant differences were between the old and the other two cohorts.

Before performance on components could be assessed, relevant scale totals (PA, NA, VIG, PE, NE and DIEN) were transformed to proportion of total scale value (i.e., score = obtained/possible; range per scale = 0 to 1) to ensure a common base for measures differing in number and value of items.

Pre-induction age and sex effects on components of well-being were assessed by a 3(age) × 2(sex) × 2(music) × 6(measures) MANOVA procedure, with measures treated as a within subjects factor. The analysis only yielded a significant measures main effect ($F(5\,3205) = 1821.3$; $p < 0.01$) and significant age by measures ($F(10\,3205) = 5.66$; $p < 0.01$) and sex by measures ($F(5\,3205) = 5.23$; $p < 0.01$) interactions (Table II).

A test of simple effects of age on each measure yielded significant effects for NA ($F(2\,664) = 5.29$; $p < 0.01$), PE ($F(2\,664) = 13.50$; $p < 0.01$), and NE ($F(2\,664) = 4.57$; $p < 0.01$). A multiple comparison of age groups (Newman-Keuls; = 0.01)) for each of the significant measures yielded the following significant differences: On NA the oldest group had significantly lower values than the other two; on PE the oldest group scored significantly higher than the other two, and on NE the oldest group scored significantly higher than the youngest, but the comparisons between middle-aged and old failed to reach the required critical value for statistical significance. Moreover, young and middle-aged people did not differ significantly on any measure. Age differences in three of the components towards greater happiness in the

TABLE II
Univariate analysis of variance summary table for baseline well-being components

Source of variation	D.f.	Mean squares	F
Age (A)	2	0.16	2.75
Sex (B)	1	0.14	2.45
Induction (C)	1	0.18	3.13
Music (D)	1	0.02	
A × B	2	0.09	1.62
A × C	2	0.02	
A × D	2	0.05	
B × C	1	0.07	1.17
B × D	1	0.02	
C × D	1	0.01	
A × B × C	2	0.01	
A × B × D	2	0.11	1.87
A × C × D	2	0.07	1.20
B × C × D	1	0.00	
A × B × C × D	2	0.02	
Between subjects error	641	0.06	
Measures (E)	5	70.26	1821.30[a]
A × E	10	0.22	5.66[a]
B × E	5	0.20	5.23[a]
C × E	5	0.07	1.71
D × E	5	0.01	
A × B × E	10	0.03	
A × C × E	10	0.02	
A × D × E	10	0.05	1.39
B × C × E	5	0.03	
B × D × E	5	0.05	1.33
C × D × E	5	0.04	1.09
A × B × C × E	10	0.04	1.10
A × B × D × E	10	0.02	
A × C × D × E	10	0.05	1.34
B × C × D × E	5	0.07	1.70
A × B × C × D × E	10	0.01	
Within subjects error	3205	0.04	

[a] $p < 0.01$.

oldest cohort are consistent with age differences on the MUNSH. A visual representation of the age by measures interaction is presented in Figure 1.

A test of simple main effects for sex on each measure yielded significant differences on VIG $F(1\ 665) = 14.57$; $p < 0.01$) and NE subscales $F(1\ 665) = 14.40$; $p < 0.01$). Women scored higher on VIG

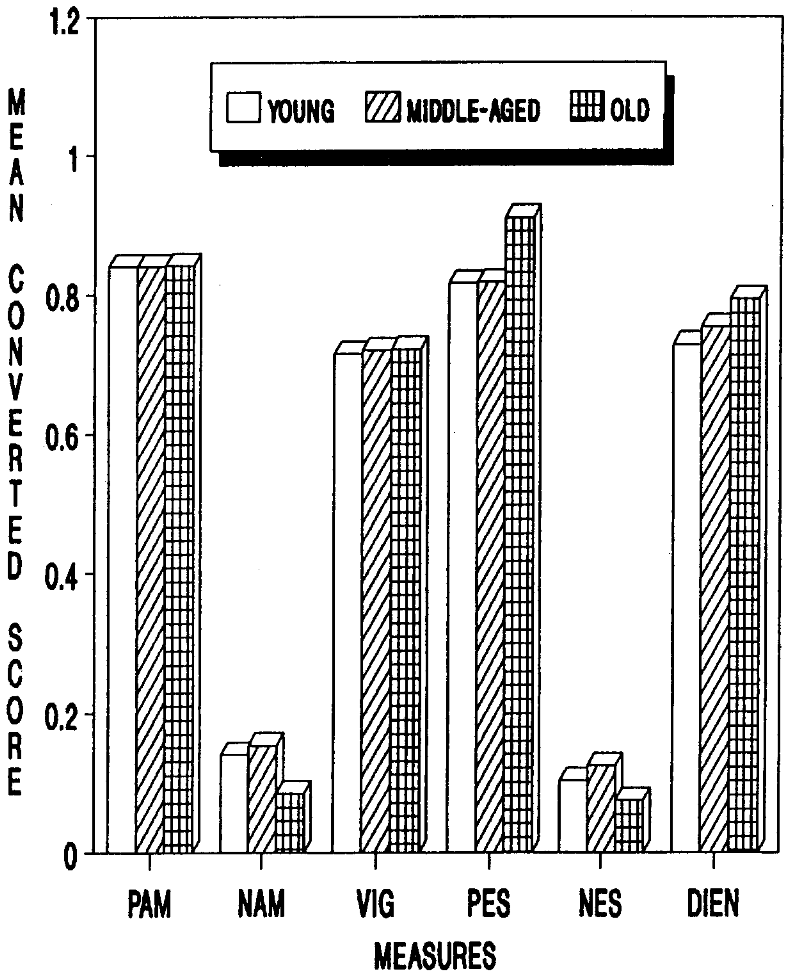

Fig. 1. Age differences on components of happiness on pre-induction scores.

and NE than men. The sex by measures interaction is presented in Figure 2.

The findings suggest that age and sex effects are contained, in part at least, in the components of well-being. Whether these variables carry additional weight may be assessed by regression analyses. To determine

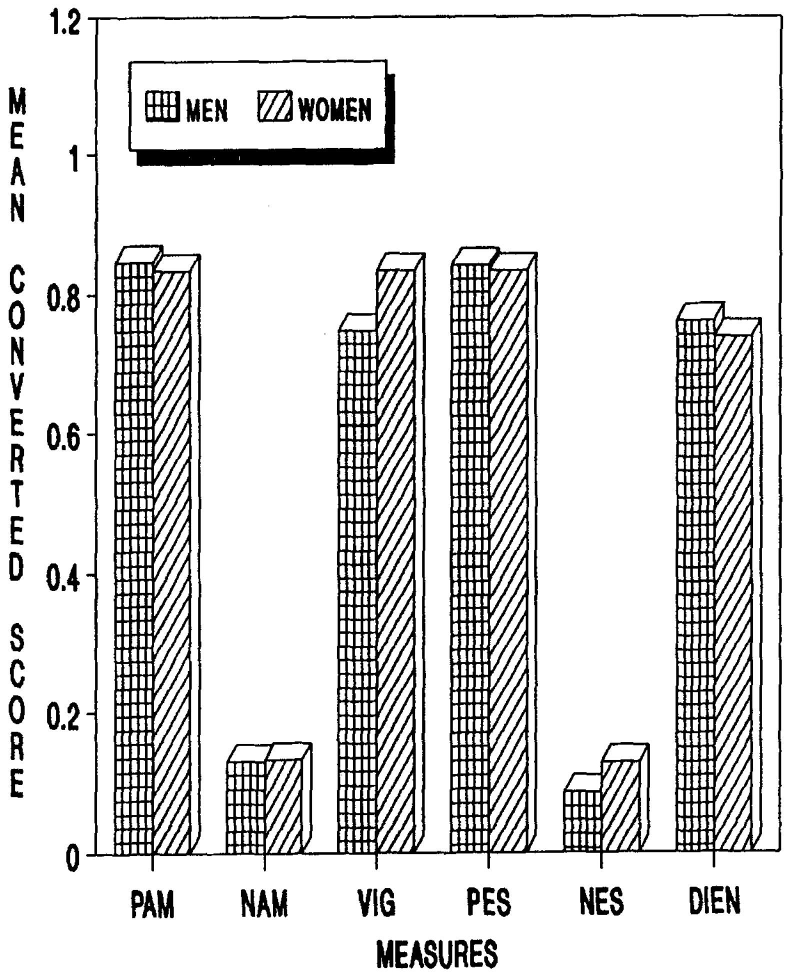

Fig. 2. Sex differences on components of happiness on pre-induction scores.

how much additional variance in current happiness could be explained by age and sex, these two variables were added to long- and short-term components to predict AVHNOW. (AVHNOW was used as the criterion measure instead of the MUNSH because the latter is a composite of current happiness and of happiness over the past month.

By its very nature, the MUNSH would be correlated with both long- and short-term components.) Since all of the long-term contributions were accounted for by the DIEN, PE and NE scores were dropped from the analyses. A fixed entry procedure was used, with the disposition components entered first (DIEN), followed by the mood components ((PA − NA) + VIG), followed by age and sex. Age and sex contributed an additional 3.4 percent to the explained variance in AVHNOW scores (Table III). In addition to the Basic (DIEN + (PA − NA + VIG)) and the Extended models (Basic, Age, Sex), Interaction (Extended plus (DIEN × (PA − NA + VIG)) and Scales interaction models (DIEN + PA + NA + VIG + Age + Sex + (DIEN × (PA − NA + VIG)) were also evaluated (Table III). The latter two models, although more complex, failed to add to the amount of explained variance in AVHNOW scores. Moreover, the interaction term failed to meet entry requirements in the regression equation. Accordingly, the weights from the Extended Model were used to derive the following prediction equation:

$$\text{AVHNOW} = 2.630 + 0.964(\text{DIEN}) + 0.800(\text{Mood}) + \\ + 0.008(\text{Age}) + 0.296(\text{Sex})\ldots \qquad (3)$$

Difference scores (pre-post) were used to assess induction effects. To assess size (as opposed to direction) of effect, scores from the two negative scales in the positive induction conditions (pre to positive and negative to positive) were multiplied by −1, while the four positive scales in the negative induction condition were multiplied by −1. Since the negative and negative to positive induction groups were not independent, data for the three induction manipulations had to be analyzed separately.

The age(3) by sex(2) by music(2) by measures(6) MANOVA procedures for positive and negative induction only yielded significant measures effects (Tables IV and V) while the shift from negative to positive induction produced an age by measures interaction in addition to the significant measures effect (Table VI). Means for the significant measures effects for positive and negative induction conditions are presented in Figure 3. Mean comparisons with the Newman-Keuls

TABLE III
Summary of regression analyses for predicting AVHNOW

Model	Predictor array	*B*	*r*	Beta	*t*
Basic	Diener (disposition)	1.00	0.38	0.20	5.24[a]
($R = 0.47$;	Mood (PA − NA + VIG)	0.77	0.40	0.34	8.58[a]
$F = 99.11$[a])	Constant	3.41			24.78[a]
Extended	Diener	1.31	0.38	0.20	5.14[a]
($R = 0.51$;	Mood	0.80	0.44	0.35	9.05[a]
$F = 58.93$[a])	Age	0.01	0.16	0.11	3.25[a]
	Sex	0.30	0.10	0.12	3.64[a]
	Constant	2.63			13.36[a]
Interaction	Diener (A)	1.32	0.38	0.27	3.39[a]
($R = 0.51$;	Mood (B)	0.99	0.44	0.43	4.89[a]
$F = 47.37$[a])	A × B	−0.29	0.45	0.14	−1.04
	Age	0.01	0.16	0.11	3.23[a]
	Sex	0.29	0.10	0.12	3.53[a]
	Constant	2.43			8.80[a]
Independent	Diener (A)	0.98	0.38	0.28	3.44[a]
($R = 0.51$;	NA (B)	−0.56	−0.25	−0.14	−2.80[a]
$F = 39.55$[a])	VIG (C)	0.84	0.34	0.23	3.71[a]
	PA (D)	0.92	0.40	0.21	3.90[a]
	Age	0.01	0.16	0.11	3.36[a]
	Sex	0.30	0.10	0.12	3.53[a]
	Constant	2.45			2.45[a]

[a] $p < 0.01$.

procedure (= 0.01) revealed the following patterns for positive and negative induction conditions:

Positive Induction VIG > PA > NA > PE, NE, DIEN
Negative Induction VIG > PA > NA, PE, NE, DIEN

Means for the age by measures interaction in the negative to positive induction condition are presented in Fig. 4. Separate mean comparisons across measures were carried out for each age group to determine pattern differences (= 0.01) in reactivity. The following patterns emerged for the three age cohorts:

Young VIG > PA > NA > PE, NE, DIEN
Middle Aged VIG > PA > NA, PE, NE, DIEN
Old VIG > PA, NA, PE, NE, DIEN

A test for the simple effects of age on each measure only yielded a significant effect for VIG ($F(2\ 320) = 4.96$; $p < 0.01$). However, mean

TABLE IV
Univariate analysis of variance summary table for different scores in the positive induction condition

Source of variation	D.f.	Mean squares	F
Age (A)	2	0.12	3.63
Sex (B)	1	0.06	1.82
Music (C)	1	0.01	
A × B	2	0.03	
A × C	2	0.01	
B × C	1	0.00	
A × B × C	2	0.01	
Between subjects error	323	0.03	
Measures (D)	5	0.32	17.52[a]
A × D	10	0.01	
B × D	5	0.03	1.47
C × D	5	0.01	
A × B × D	10	0.00	
A × C × D	10	0.04	1.95
B × C × D	5	0.02	
A × B × C × D	10	0.01	
Within subjects error	1615	0.02	

[a] $p < 0.01$.

TABLE V
Univariate analysis of variance summary table for difference scores in the negative induction condition

Source of variation	D.f.	Mean squares	F
Age (A)	2	0.53	3.67
Sex (B)	1	0.12	
Music (C)	1	0.20	1.42
A × B	2	0.56	3.92
A × C	2	0.37	2.57
B × C	1	0.06	
A × B × C	2	0.21	1.49
Between subjects error	313	0.14	
Measures (D)	5	1.23	38.90[a]
A × D	10	0.07	2.12
B × D	5	0.07	2.11
C × D	5	0.01	
A × B × D	10	0.03	
A × C × D	10	0.04	1.16
B × C × D	5	0.02	
A × B × C × D	10	0.05	1.43
Within subjects error	1565	0.03	

[a] $p < 0.01$.

TABLE VI
Univariate analysis of variance summary table for difference scores in the negative to positive condition

Source of variation	D.f.	Mean squares	*F*
Age (A)	2	0.54	3.12
Sex (B)	1	0.29	1.67
Music (C)	1	0.12	
A × B	2	0.68	3.93
A × C	2	0.32	1.87
B × C	1	0.06	
A × B × C	2	0.34	2.00
Between subjects error	308	0.17	
Measures (D)	5	1.46	51.39[a]
A × D	10	0.07	2.45[a]
B × D	5	0.05	1.92
C × D	5	0.02	
A × B × D	10	0.03	
A × C × D	10	0.03	
B × C × D	5	0.01	
A × B × C × D	10	0.02	
Within subjects error	1540	0.03	

[a] $p < 0.01$.

comparison failed to differentiate among age cohorts at the selected significance level, despite a rank order of means from young to old.

The final question to be addressed was whether the prediction of AVHNOW is modified by mood induction. The regression equation developed from the weights of the Extended Model in the pre-induction phase (Equation (3)) was applied to post-induction AVHNOW scores for each induction condition to determine how well the model predicted present happiness after the mood manipulation. Age, sex, and post-induction mood and disposition scores were added to the regression equation to determine whether these predictors would increase explained AVHNOW variance. In all three induction conditions, the equation explained at least as much AVHNOW variance as it did in the pre-induction phase. For both negative and positive induction procedures, the addition of post mood scores slightly enhanced AVHNOW prediction; for the negative to positive procedure, age, rather than mood led to a slight enhancement of AVHNOW prediction (Table VII).

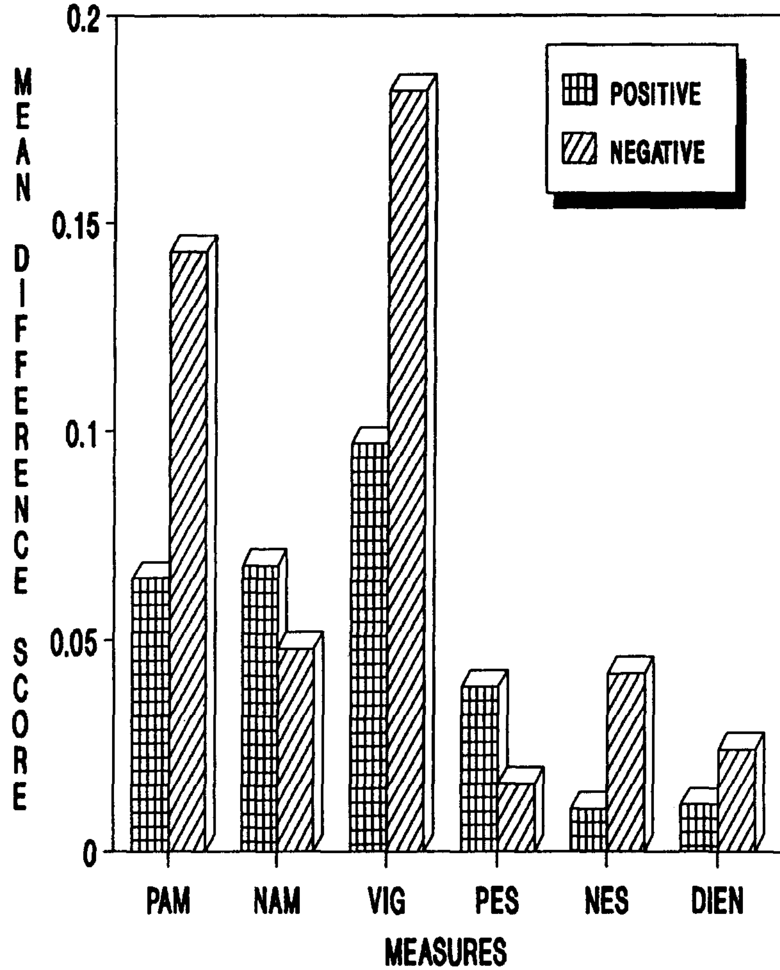

Fig. 3. Induction effect on measures for positive and negative induction procedures.

DISCUSSION

The basic question raised in this study was the extent to which a general model of well-being, based on long- and short-term affective states, would apply equally well to several age cohorts. The presence of age effects in pre-induction measures suggests that such a model would

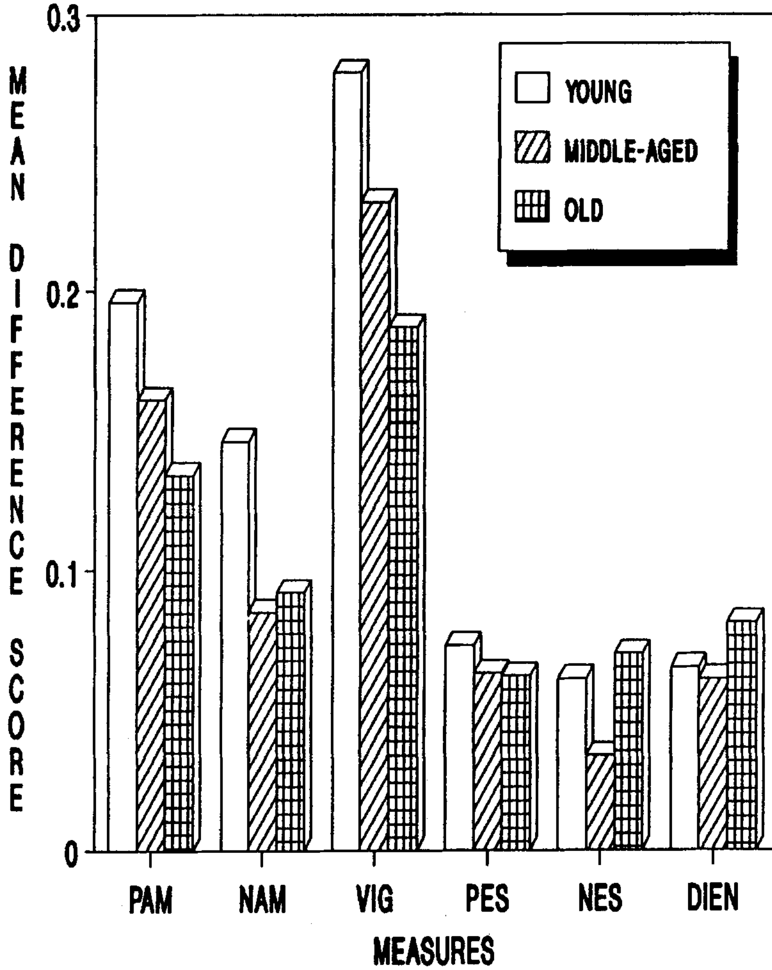

Fig. 4. Reactivity on measures by age groups following the shift from negative to positive induction.

benefit from the addition of age parameters, although some of the age effects seem to be subsumed under the well-being components. This expectation was confirmed by the independent contributions both of age and sex variables to an explanation of AVHNOW scores in the pre-induction data. It is somewhat disappointing, however, that even models

TABLE VII
Summary of regression analyses using the prediction equation derived from the extended model and the post-induction predictor array to explain post-induction AVHNOW

Induction	Variable array	B	r	Beta	t
Positive ($R = 0.64$; $F = 122.34^{**}$)	Equation	0.85	0.47	0.63	4.48[a]
	Mood	0.49	0.22	0.60	2.70[a]
	Constant	0.30			0.62
Negative ($R = 0.70$; $F = 156.18$[a])	Equation	0.43	0.19	0.68	2.22[b]
	Mood	0.94	0.48	0.69	4.70[a]
	Constant	1.45			1.89
Negative → Positive ($R = 0.57$; $F = 78.13$[a])	Equation	1.18	0.60	0.55	12.50[a]
	Age	−0.01	−0.17	0.30	−3.64[a]
	Constant	−0.21			−0.42

[a] $p < 0.01$.
[b] $p < 0.05$.

with specific weights for affect, disposition, age, and sex could explain only about 25 percent of the variance in current happiness scores. In part, the low percentage of explained variance can be attributed to the criterion measure. General ratings of current happiness are far from an ideal criterion (Kozma *et al.*, 1991), but at least they allow for a comparison of models of well-being. On the other hand, the fact that explained variance in current ratings of happiness increases after both negative and positive mood induction suggests that variability in well-being scores under neutral environmental conditions may be insufficient to allow for effective discrimination among subjects differing in levels of well-being.

On the positive side, an equation based on the pre-induction weights of predictors was able to explain up to 50 percent of the post-induction variance in current well-being. Moreover, only slight increase in "R" were obtained when the post-induction predictor array was added to the equation in regression analyses. The weights for affect and disposition components obtained during pre-induction appear to be relatively robust. It will be interesting to determine how well they hold up over time and across subjects. As expected, when additional amounts of variance are explained by components, it is affect and not disposition that contributes to the explanation of current well-being after both positive and negative mood manipulations. The additional contribution of age to an explanation of current happiness in the shift from negative to positive induction is puzzling. The finding suggests that elderly individuals may be less systematic in their response to inconsistent environments than younger individuals.

Reactivity is addressed by the measures main effect in the negative and positive induction conditions and by the age by measures interaction in the NI → PI condition on difference scores. The positive mood induction yielded significant differences between the three short-term and the three long-term affect measures. These findings are completely consistent with predictions. The negative induction condition yielded such differences between two of the short-term affect measures (VIG and PA) and all three long-term affect measures. It may be difficult to increase negative mood in community populations with the Velten procedure. It must be noted, however, that whenever differences among measures are produced by mood induction they are always on the short-term components.

The results for the NI → PI shift are the most intriguing. Not only are the obtained difference scores greater than those produced by simple positive and negative induction, but the procedure produced significant age differences on measures. Young people showed the predicted results; short-term affect scores changed more than long-term affect scores. Middle-aged persons showed the differential effects on two of the three short-term affect measures (VIG and PA), while for old persons, only the most reactive mood measure, VIG, was significantly different from the three disposition measures. If reactivity is treated as a significantly greater change on a greater number of mood components, then young are clearly more reactive than middle-aged, and middle-aged are more reactive than old. The age effect on VIG is consistent with such an interpretation, and a lack of a significant age effect in favour of the old group on any dispositional component rules out greater indiscriminate responsiveness by this group. Obviously, the reactivity data for the young age group provides the clearest evidence for a mood/disposition formulation of happiness.

NOTES

Reprint requests should be addressed to: A Kozma, Department of Psychology, Memorial University of Newfoundland, St. John's, N. F., Canada A1B 3X9.

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[2] Parts of this paper were presented at 12th World Congress of Sociology, Madrid, July, 1990 and an Invited Colloquium at the University of Victoria, Canada, Jan., 1991.

REFERENCES

Bradburn, N. M.: 1969, The Structure of Psychological Well-Being (Aldine, Chicago).

Bradburn, N. M. and Caplovitz, D.: 1965, Reports on Happiness (Aldine, Chicago).

Costa, P. T. and McCrae, R. R.: 1984, 'Personality as a lifelong determinant of well-being', in C. Z. Malatesta and C. E. Izard (eds) Emotion in Adult Development (Sage, Beverly Hills, CA).

Diener, E.: 1984, 'Subjective well-being', Psychological Bulletin 95, 542—575.

Diener, E., Emmons, R., Larsen, R., and Griffin, S.: 1985, 'The satisfaction with life scale', Journal of Personality Assessment 49, 71—75.

Kozma, A.: 1991, Mood and Disposition Components of Happiness, invited colloquium presentation, University of Victoria, Feb.

Kozma, A.: 1986, The Structure of Happiness, invited address to the Canadian Psychological Association, Toronto, June.

Kozma, A. and Stones, M. J.: 1983, 'Predictors of happiness', Journal of Gerontology 38, 626—628.

Kozma, A. and Stones, M. J.: 1980, 'The Measurement of Happiness: Development of the Memorial University of Newfoundland Scale of Happiness (MUNSH)', Journal of Gerontology 35, 906—912.

Kozma, A., Stones, M. J., and McNeil, J. K.: 1991, 'Psychological well-being in later life', (Butterworths, Toronto).

Kozma, A., Stone, S., Stones, M. J., Hannah, T. E., and McNeil, J. K.: 1990, 'Long- and short-term affective states in happiness: Model, paradigm and experimental evidence', Social Indicators Research 22, 119—138.

McNeil, J. K.: 1987, Mood: Measurement, Diurnal Variation and Age Effects, unpublished Ph.D. thesis, MUN.

Stones, M. J. and Kozma, A.: 1986a, 'Happiness and activities as propensities', Journal of Gerontology 41, 85—90.

Stones, M. J. and Kozma, A.: 1986b, 'Happy are those who are happy . . .: a test between two causal models of relationships between happiness and its correlates', Experimental Aging Research 12, 23—29.

Stones, M. J. and Kozma: 1989, 'Happiness and activities in later life: a propensity formulation', Canadian Psychology 30, 226—237.

Stones, M. J. and Kozma, A.: 1991a, 'A magical model of happiness', Social Indicators Research 24, 43—62.

Stones, M. J. and Kozma, A.: 1991b, 'A magical model of happiness to predict individual differences in mood change', Social Indicators Research 25, 59—67.

Velten, E.: 1968, 'A laboratory task for induction of mood states', Behavior Research and Therapy 6, 473—482.

Yardley, J. K. and Rice, R. W.: 1991, 'The relationship between mood and subjective well-being', Social Indicators Research 24, 101—111.

Gorontology Centre,
Memorial University of Newfoundland