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HAPPINESS HAS TRAITLIKE AND STATELIKE PROPERTIES: A REPLY TO VEENHOVEN

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ABSTRACT. Veenhoven (1994) contrasted hypotheses of whether happiness is a trait or state, concluding that it is a state variable. This article critiques the conceptual foundation of Veenhoven's paper, and examines technical deficiencies in his review of evidence. Based on previous findings and new analyses, we conclude that happiness has both traitlike and statelike properties, but that individual differences in happiness endure despite its situational reactivity, and explain greater variance than situational effects.

A tactic of polemics includes the following: the polemicist proposes and allegedly weak option (i.e., a 'straw man') as the only viable alternative to a belief held; arguments are provided to refute the 'straw man'; *ergo*,the polemicist claims proof for the belief. To rebut such argumentation, an antagonist must show (1) that the 'straw man' is not the only alternative to the polemicist's belief, (2) that it can be defended, or (3) that the polemicist's own beliefs fail to pass scrutiny.

Ruut Veenhoven (1994) used the context of humanistic and utilitarian philosophy to ask the following question in this journal: "Is happiness a trait?" (p. 101). He contrasted two alternatives of "whether happiness can be characterized as a stable personal *trait* rather than a variable *state*" (p. 107; italics added). Not surprisingly, given his philosophical bent, he claimed to refute happiness as a trait, concluding that because "happiness is no immutable trait . . . there is still sense in striving for greater happiness for a greater number" (p. 101).

A happiness trait is the 'straw man' to state beliefs in Veenhoven's polemic, which he presented at the levels of person and population. We shall rebut his argumentation at the person level on three grounds. First, a trait-state dichotomy lacks credibility because of evidence that personal happiness has both traitlike and statelike properties (i.e., a trait *and* state alternative is more convincing than Veen-

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hoven's trait *or* state dichotomy). Second, strong evidence can be cited for the traitlike nature of happiness, with Veenhoven's attempt at refutation containing idiosyncracy and misinterpretation. Third, a proposal that happiness is generally more statelike than traitlike fails to pass empirical scrutiny.

We shall refrain from commenting on Veenhoven's arguments applied at the population level. To psychologists like ourselves, happiness is an individual difference variable. Veenhoven provides no rationale to convince us that a 'cultural trait' or 'national trait' of happiness is other than the mean within a nation or subpopulation. Variation in such means with time or circumstance (e.g., migration) may have relevance to argumentation that happiness is statelike. We do not dispute this proposition that happiness has reactive potential. However, we do dispute that variation in population means has relevance to the evaluation of happiness as a trait. A trait, by definition, is an individual difference dimension having specific and consensually understood properties, about which we shall subsequently elaborate.

DEFINITIONS

We have no quarrel with Veenhoven's definitions. Although his definition of happiness contains redundancy, (i.e. the "overall quality" of "life-as-a-whole", p. 106), its emphasis on general subjective well-being is not inconsistent with most others. It enables a separation of happiness from narrower constructs like mood and domain satisfactions, which respectively delimit well-being to time and content.

Veenhoven (1994) also distinguishes fairly between traits and states. A trait refers to a durable condition hypothesized to contribute to stability over time and consistency across situations. A state, on the other hand, is reactive to situation. Veenhoven correctly aligns the constructs as follows: "traits are typically seen as causes, states as results" (p. 107).

TRAIT AND STATE AS INTERPRETATIVE CONSTRUCTS

Is happiness a trait? Veenhoven could equally have asked whether happiness is a state, or a trait/state combination. Because traits and

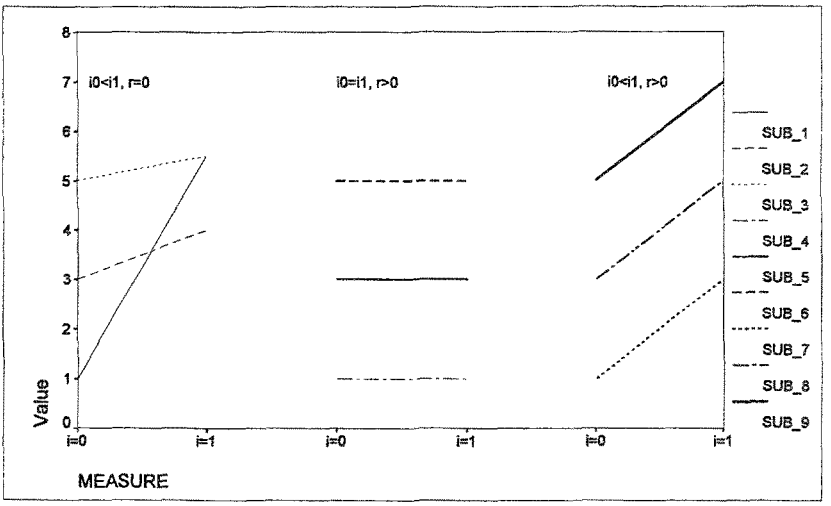

Fig. 1. Hypothetical data from 3 groups of 3 subjects on 2 measures.

states are interpretive constructs, these questions must be answered by aligning empirical evidence against conceptual templates. An elementary mistake is to assume that a person variable must be either traitlike or else statelike, a dichotomy long relegated to anachronism in personality research (Bowers, 1973).

Testable trait/state hypotheses about happiness concern its variation over time and across situations. Traits have the purpose to explain covariation among measures of a person variable despite situational reactivity. Such interpretation is tenable only if individual differences explain substantial covariation among congruous measures taken in varying situations or over prolonged periods. States describe reactivity to situations despite durable individual differences. Figure 1 presents hypothetical data to illustrate alignment against state, trait, and trait and state templates.

The values are hypothetical scores on two measures (i_0 and i_1) by three groups of three subjects. The measures can be the same person variable (e.g., happiness) in two situations or at repeated times. The data from subjects 1–3, at the left of the figure, show one pattern expected if the variable is a state but not a trait. The critical features are that the measures have different means ($i_0 < i_1$) but are uncorrelated ($r = 0$). The data in the middle of the figure (subjects 4–6) give expectations if the variable is a trait but not a

state. There is no difference in the mean ($i_0 = i_1$) but the measures are correlated ($r > 0$). Finally, the rightside data (subjects 7–9) give expectations if the variable is both a state and trait, with the measures having different means ($i_0 < i_1$) and showing correlation ($r > 0$). More complex templates, including trait by state interactions, are also possible but not shown here. Because research on a range of person variables found them to fit complex templates that subsume that of trait and state (Bowers, 1973), Veenhoven's assumption that happiness data aligns only with the trait or state template appears overly simplistic.

THE TRAITLIKE PROPERTIES OF HAPPINESS

We believe that Veenhoven made conceptual and technical errors in his attempt to refute the traitlike properties of happiness. The errors concern the cross-situational consistency of happiness, its temporal stability, and dispositional determination.

Cross-Situational Consistency

Veenhoven wrote as follows: "If happiness is a traitlike disposition rather than a statelike evaluation of life, happiness must remain largely the same in different situations" (p. 114). This inference is incorrect.

Cross-situational consistency is one of two main criteria for attributing traitlike properties to a variable. However, this consistency refers to individual differences despite situational variation, not to an absence of situational reactivity. To illustrate, consider the sociability of a hypothetical introvert and extravert at a party and in a library. To be cross-situationally consistent, the extravert should be more outgoing than the introvert at the party and more friendly in the library. On the other hand, it is reasonable to expect both individuals to be less gregarious in the library than at the party; otherwise, they would give offense to the other readers at the library, not to mention the risk of reprimand from an irate librarian. Similar reasoning applies to happiness. To be cross-situationally consistent does not imply that happiness must be at comparable levels under adverse and favourable conditions, but instead that individual differences in happiness should endure across the conditions. Consequently, find-

ings relevant to cross-situational consistency of happiness includes the expectation of a nonzero correlation between measures taken from the same sample in different situations. Findings that happiness differs with situation and circumstance are irrelevant to the evaluation of a happiness trait template. As shown by the rightside data in Figure 1 (i.e., subjects 7–9), evidence that happiness is reactive to situation does not preclude its interpretation as a trait.

Veenhoven cited no findings on the cross-situational consistency of individual differences in his article, being under the misapprehension that evidence of situational reactivity refutes a trait interpretation. The findings he reviewed show differences between samples living under adverse or favourable conditions, and changes in happiness during periods of situational perturbation, neither of which has relevance to the evaluation of happiness as a trait. We shall return to this issue in a later section of this article, with evidence that individual differences remain consistent despite variation in situational parameters.

Temporal Stability

Temporal stability is the second main criterion for trait attribution. Although Veenhoven acknowledged evidence for substantial stability in happiness over prolonged periods, the levels of stability are underestimated because of idiosyncratic selection of data and incorrect interpretation of stability estimates.

Veenhoven chose to review "only data based on indicators that were deemed acceptable (and) as a consequence several well known studies . . . are left out" (p. 106). He referred the reader to chapter 4 of his 1984 book for the criterion used to differentiate acceptable from unacceptable indicators. There we find that the only means to differentiate indicators is face validity (i.e., with a disregard of measures based on construct, convergent, and discriminant validation criteria). Although Veenhoven attempted to justify his disregard of measures without face validity in that chapter, an exclusive reliance on face validity appears psychometrically idiosyncratic.

The findings he reviewed in the 1994 article are based on indicators of low reliability, with omission of findings obtained with more reliable measures. For example, he selected from Kozma and Stones (1980) only findings with the Affect Balance Scale (ABS)

and a two-item index, but omitted data from three multi-item scales all with higher internal consistency than the ABS. The indicators he cited most frequently are single-item self-ratings and the ABS, which were respectively used in 14 and 8 of the 26 studies reviewed. Because both these indexes have low reliability (Kozma *et al.*, 1991), we can expect the stability coefficients to be correspondingly attenuated. Also, 30% of the findings included in Veenhoven's review were from infants or children. If a happiness trait solidifies with maturation, immaturity may be another factor to attenuate the stability estimates.

Despite these selection biases, the temporal stabilities Veenhoven reviewed are surprisingly high. He reported an average correlation of around .35 with intervals of several months to 40 years, and a 'true stability' of about .4 over 10 years (p. 110). To what extent are these estimates attenuated because of selection factors? Kozma *et al.* (1991) provide a base for comparison. They reported higher stabilities than Veenhoven after reviewing eleven studies with adults that mainly used reliable multi-item scales, concluding that happiness "accounts for up to 62% of its variance when measured over ... an average of ten years" (p. 98).

Veenhoven also underestimates stability by misinterpreting the meaning of stability coefficients. Commenting on a 40-year study by Mussen *et al.* (1982), he cited stability coefficients from .15 to .28 with selected indexes, and an average correlation of .23. He concluded that these values "indicate that happiness in young adulthood explains only 10% of happiness in late adulthood" (p. 110). Because he gave no rationale for this estimate, we infer that he squared then rounded upward the correlation to obtain the variance estimate. If so, he was in error. It is the stability coefficient that gives the true score variance in classical psychometric theory, not the squared coefficient (Stones *et al.*, 1991). Consequently, up to 30% of the happiness variance in Mussen *et al.*'s (1982) data can be explained by a trait, not the 10% claimed by Veenhoven. If other measures used by Mussen *et al.* (1982) are considered valid data (i.e., indexes without face validity), the estimate of stability is higher still.

We can summarize the preceding discussion with the following estimates of stability. Using face validity as the exclusive criterion for data selection, the stable variance in happiness averages 40% over

ten years and 30% over forty years among adult. With data from more rigorously validated measures, the respective estimates are up to 20% higher. We conclude that the temporal stability of happiness meets the requirements of a trait irrespective of the source of data.

Influence of Temperament

Behavior geneticists assume traits to arise from interactions of innate dispositions with life experience. After reviewing evidence on the innate dispositions, Veenhoven acknowledged with reservation that traits may coexist alongside situational determinants: "Even if there is a marked inner disposition to be happy or not, that does not mean a better society cannot make people any happier" (p. 129). We can agree with this statement, but must criticize Veenhoven's underestimation of effects due to temperament.

First, he cited Wierzbicki (1986) that hedonic tone correlates at .55 in monozygotic twins (mz) but .15 in dizygotic twins (dz). He considered these data to show only "modest" support for genetic influence (p. 125). This inference is unsupportable if conventional procedures are used to estimate the contribution of heredity (h) to a variable. With heredity estimated by $h = 2\ (r_{mz} - r_{dz})$, its contribution to happiness is 80%. An estimate of this magnitude is certainly not modest.

Second, Veenhoven cited Buss and Plomin (1984) on inherited temperaments. While acknowledging that temperament can impact on happiness, he failed to mention that such measures (e.g., extraversion, neuroticism, components of affect intensity) are among its most powerful predictors, and certainly much stronger correlates than most situational indicators (Kozma *et al.*, 1991; Stones and Kozma, 1994). Future research might usefully explore the function of temperament to provide the underlying basis of a happiness trait.

HAPPINESS IS MORE TRAITLIKE THAN STATELIKE

Veenhoven ignored the literature of the past two decades when taking the trait *versus* situational debate to an all-or-nothing extreme. Beiser (1974) may have made the first empirical differentiation of happiness into durable (trait) and reactive (state) components. We

shall attempt to apply such differentiation in the following contexts: the interpretation of (1) cross-sectional data, (2) experimental and longitudinal findings, and (3) new analyses that partition happiness variance between trait and state components.

Cross-Sectional Designs

Although cross-sectional findings show happiness to have low-to-moderate correlations with demographic, life situation,lifestyle, and domain satisfaction indicators (Kozma *et al.*, 1991; Stones *et al.*, 1991), correlational data are inconclusive on the direction of causality. Researchers may prejudge causal direction by making happiness the dependent variable in regression or ANOVA designs. However, such choices tell more about the *a priori* assumptions of the researcher than causal determination. To illustrate, Figure 2 includes three plausible models relating a trait, situation, and situational appraisal in correlational design, only one of which uses happiness as the dependent variable (Figure 2).

The first model reflects the *bottom-up* convention that happiness is a state that is reactive to situation, as mediated though situational appraisal (e.g., perceived satisfaction, burden, or hassle). A researcher using this model would analyze happiness as the dependent variable, with objective and perceived domain indicators as predictors. Its limitations are shown by relatively low variances explained even in multivariate predictions, which regularly fail to achieve the stability estimates of happiness measures (Stones *et al.*, 1991). Consequently, the model lacks sufficient predictive power to explain the stability of happiness.

The *top-down* model assumes a happiness trait to affect the choice and appraisal of situations, with appraisal also affected by situational parameters. Appraisal should be the dependent variable in analyses of this model, which receives support from two kinds of data: the generally higher correlations of happiness with domain satisfactions than objective situation indicators (i.e., because happiness has both direct and indirect impact on appraisal); findings that happiness explains significant covariation among appraisals of different domains (Stones and Kozma, 1986). Its main limitation is a failure to allow for situational determination of happiness. Examples of the latter include low happiness among elderly institution

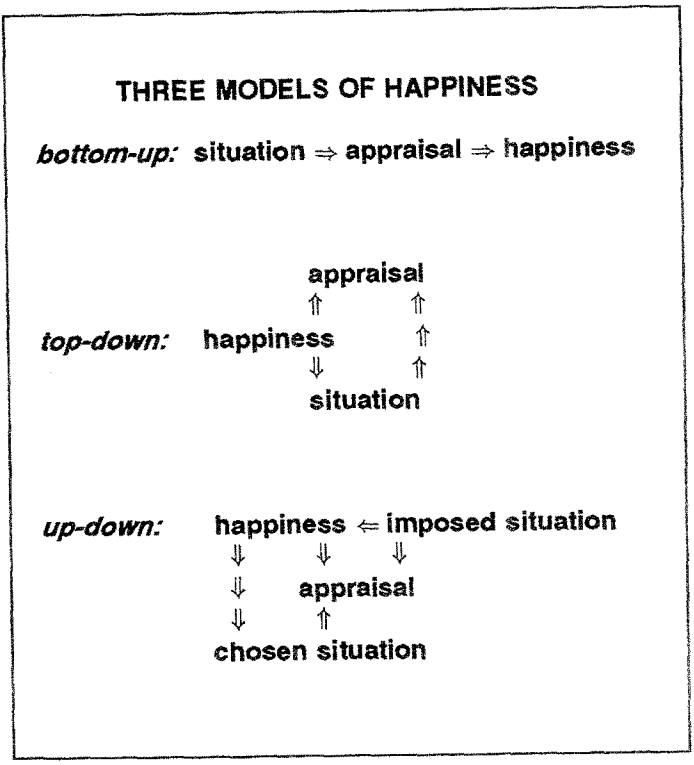

Fig. 2. Three models relating happiness, situational appraisal, and situation.

residents (Stones and Kozma, 1989) and black residents of South African (Moller, 1992).

The third *up-down* (i.e., state and trait) model overcomes the limitations of those preceding. Appraisal is again the dependent variable, being acted upon downwardly by happiness and upwardly by situation. However, this model allows for bidirectional determination between happiness and situation. We hypothesize that the factors affecting the causal direction include whether the situation was chosen or imposed. Although a happiness trait can affect situational choice, imposed situations may affect happiness by restricting the range of choice. Limited choice may be the reason for the aforementioned low happiness of elderly institution residents and people subject to restrictive political regimes.

Experimental and Longitudinal Findings

A few experimental and longitudinal findings addresses the issue of causal determination. Kozma *et al.*, (1990) described a longitudinal-experimental paradigm that distinguishes between the reactive and traitlike properties of happiness. Immediate (reactive) and general (durable) measures of happiness were taken before and after a positive or negative mood induction, with the procedure repeated using the same subjects some years later (Kozma *et al.*, 1992). The findings support Beiser's (1974) contention that happiness comprises distinct components, one being stable but relatively nonreactive, and the other being reactive but with low stability.

Longitudinal designs offer the possibility to determine whether the stability of happiness can be explained by variation among its predictors. Stones and Kozma (1981) described early findings that happiness was maximally predicted by its prior level, with minimal additional contributions by its major correlates. Atkinson (1982) was probably the first investigator to show minimal effects on the stability of happiness because of major life changes during the intervening period. Stones and Kozma (1986) and Heady *et al.* (1991) compared causal models that made happiness a cause or consequence of variation among its major correlates. The findings from both studies indicated that happiness was more a cause than a consequence. Consequently, the balance of longitudinal evidence strongly suggests happiness to be more a durable than a reactive variable.

Partitioning Variance between Stable and Reactive Components

Bowers (1973) pointed out that different designs predispose researchers towards different types of analysis and interpretation. Correlational research favours trait models if both variables are person measures, whereas variance decomposition designs (e.g., group contrast and regression against situation or situational appraisal indicators) favour state interpretations. Unlike other aspects of personality study, the happiness literature is deficient in comparisons that partition variance between trait and state components. ANOVA can be used for this purpose with selected designs. The following examples report findings with a split-plot factorial (SPF – $p.q$) design that contrasts p independent groups of n per-

sons on *q* repeated measures, where the groups represent treatments and the repeated factor was either positive and negative experiences or time (Kirk, 1982, pp. 489–523). In all the examples, the dependent variable is the score on a subjective well-being measure.

We selected three examples of studies in which the state effects are not only statistically significant but also socially important, and computed estimates of the variance explained by situation and durable individual differences. The first study is the Canadian Study of Health and Aging (1994), a national study of dementia in people aged over 65 years that used a stratified random design. One component of the study examined patterns of caring for elderly dependent people. Caregiving to Alzheimer patients is among the most stressful and debilitating forms of life experience. Valid data were reported on 1,432 caregivers divided according to a 2 by 2 classification: caregivers to Alzheimer patients, or persons of comparable age who cared for an elderly dependent without dementia; caregivers for whom the recipient of care resided within or outside an institution. The measures we computed from the caregiver data included happiness and depression indexes derived from factor analysis of the Centre for Epidemiological Studies Depression scale (CES-D; Radloff, 1977). We expressed these indexes as standard scores keyed in the same direction. They measure recent positive and negative experiences, and are assumed to have different situational determinants. The total situational variance in the data comprises the difference between groups and the differential reactivity of the measures across groups (i.e., group by measure).

The second study is one by Rattenbury and Stones (1989). They reported significant pre-post-intervention gains on the Memorial University of Newfoundland Scale of Happiness (MUNSH; Kozma and Stones, 1980) in a randomized controlled design that included two psychosocial treatments with elderly institution residents. Because the prevalence of unhappiness and depression among residents in long-term care is among the highest in the developed world, the success of the treatments has profound therapeutic implications. The total situational variance includes that associated with groups, time, and their interaction.

The third study is by Stones *et al.* (1995). They examined 178 elderly institution residents from five institutions over 18 months.

The residents within each institution were randomly assigned to psychosocial treatment and control groups. Measures taken at 1.5, 8.5, and 18 months showed significantly higher happiness (i.e., the MUNSH) in the treatment groups, and also postponed physical morbidity and mortality. The total situational variance in happiness for the 81 persons present at all three assessments includes that due to groups, time, and their interaction.

For the purpose of analyzing the three studies, we assumed a mixed design with groups a fixed factor, and the repeated measure and persons within groups as random factors. We designated the groups factor as fixed because interest in the respective studies was confined to those groups and no others. The repeated measure factor and subjects within groups are considered random because they represent examples (i.e., measures or time, and persons) drawn from wider arrays. The variance can be partitioned into that due to groups (σ_g^2), the repeated measure (σ_m^2), their interaction (σ_{gm}^2), persons with groups (σ_p^2), and a residual component comprising error and the person by repeated measure interaction ($\sigma_e^2 + \sigma_{mp}^2$). The components of variance associated with p, q, and n levels of group, repeated measure, and persons within group were computed using expectations of mean squares (MS_k) contained in Table 11.3-1 of Kirk (1982) as follows:

(1) *Situational components*

$$\sigma_g^2 = (MS_g - MS_{gm} - MS_p + MS_e)/nq,$$

$$\sigma_m^2 = (MS_m - MS_e)/np,$$

$$\sigma_{gm}^2 = (MS_{gm} - MS_e)/n;$$

(2) *Person component*

$$\sigma_p^2 = (MS_p - MS_e)/q;$$

(3) *Residual component*

$$\sigma_e^2 + \sigma_{mp}^2 = MS_e.$$

The findings allow answers to three questions about the relative stability and reactivity of happiness. First, is the situational reactivity of happiness significant? The answer is affirmative in all three studies, with at least one situational effect significant at $p < .01$.

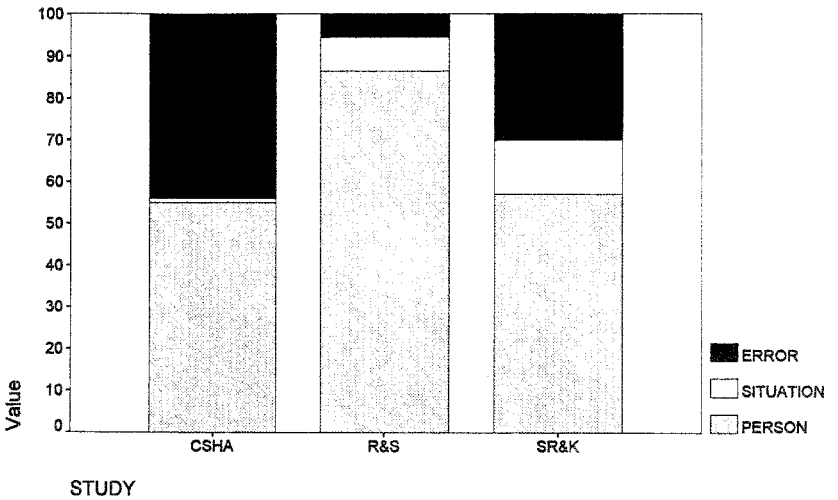

Fig. 3. Variances partitioned among situation, person, and residual (error) components in the Canadian Study of Health and Aging (1994), Rattenbury and Stones (1989), and Stones *et al.* (1995).

Second, is the stability of happiness significant across the repeated factor? This comparison tests the person variance (MS_p) against the residual variance (MS_e), and is appropriate insofar as the repeated factor is a random variable. The findings are again affirmative in all three studies, with significance at $p < .001$ or beyond. Third, what proportions of variance can be designated as due to situation, person, and error? This question was answered by partitioning the variance into its components. The total situational variance is given by $\sigma_g^2 + \sigma_m^2 + \sigma_{gm}^2$, the stable person variance by σ_p^2, and error by $\sigma_e^2 + \sigma_{mp}^2$. The findings in Figure 3 show the proportion of stable variance to exceed that of reactive variance by ratios of 50:1, 10:1, and 4:1 in the three studies. Although the explained variances were found to vary slightly with alternative assumptions about the fixed and random nature of the factors, the substantially higher variance explained by person over situation remained robust irrespective of the assumptions made.

CONCLUSIONS

The preceding partitioned variances provide support for the cross-situational stability of happiness despite evidence of co-existing

situational reactivity. The person term explained significant variance in the three studies, and accounted for substantially greater variance than situational effects irrespective of whether the latter were operationalized by differences in caretaking role or the effects of psychosocial therapy. Because previous literature confirms the long-term stability of happiness, the conclusion is inescapable that happiness satisfies the two main requirements of trait (i.e., cross-situational consistency and temporal stability).

The general model that best fits the available evidence is neither the simplistic bottom-up (i.e., state) nor top-down (trait) formulations, but an up-down model that includes stable and reactive components. Members of the up-down family include Beiser's (1974) ancestoral formulation, the componential model of Kozma *et al.* (1990), and Stones and Kozma's (1991) mathematical steady state model. None of the latter three models is at odds with Veenhoven's advocation that the pursuit of greater happiness is a viable aim, and particularly for people suffering adversity, but all suggest considerable determination of happiness by a dispositional component. It is because happiness is so strongly determined by disposition that situational appraisals may provide more accurate reflections than happiness measures of the satisfactions and hassles contingent upon environmental factors.

Our conclusions are as follows. First, happiness is a durable individual difference dimension having limited but significant reactivity to situation. Second, we agree with Veenhoven that there is sense in striving for happiness, and particularly by people in situational adversity. Third, we disagree with his inference that happiness is the best all-purpose social indicator to monitor the effects of social or therapeutic intervention. Happiness measures do have a demonstrated sensitivity to the effects of pervasive situational restraint (e.g., associated with institutionalization and repressive political regimes). However, because much of the variance is happiness is due to stable individual differences, situational appraisals may monitor the effectiveness of domain-specific interventions more sensitively than happiness.

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REFERENCES

Atkinson, T.: 1982, 'The stability and validity of quality of life measures', Social Indicators Research 10, pp. 113–132.

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

Bowers, K. S.: 1973, 'Situationism in psychology: An analysis and a critique', Psychological Review 80, 307–336.

Buss, A. H. and R. Plomin: 1984, Temperament: Early Developing Personality Traits (Erlbaum, Hillsdale, New Jersey).

Canadian Study of Health and Aging: 1994, 'Patterns of caring for people with dementia in Canada', Canadian Journal on Aging 13, pp. 470–487.

Heady, B., R. Veenhoven and A. Wearing: 1991, 'Top-down versus bottom-up theories of subjective well-being', Social Indicators Research 24, pp. 81–100.

Kirk, R. E.: 1982, Experimental Design: Procedures for the Behavioral Sciences, 2nd edition (Brooks/Cole, Monterey, California).

Kozma, A., R. di Fazio, M. J. Stones and T. E. Hannah: 1992, 'Long- and short-term affective states in happiness: Age and sex comparisons', Social Indicators Research 4, pp. 293–310.

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

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

Kozma, A., M. J. Stones and K. McNeil: 1991, Subjective Well-Being in Later Life (Butterworths, Toronto, Canada).

Moller, V.: 1992, 'Spare time use and perceived well-being among black South African youth', Social Indicators Research 21, pp. 279–292.

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.

Radloff, L. S.: 1977, 'The CES-D scale: A self report depression scale for research in the general population', Applied Psychological Measurement 1, pp. 385–401.

Rattenbury, C. and M. J. Stones: 1989, 'A controlled evaluation of reminiscence and current-topics discussion groups in a nursing home context', The Gerontologist 29, pp. 768–771.

Stones, M. J. and A. Kozma: 1986, '"Happy are they who are happy ...": A test between two causal models of relationships between happiness and its correlates', Experimental Aging Research 12, pp. 23–29.

Stones, M. J. and A. Kozma: 1989, 'Multidimensional assessment of the elderly via a microcomputer: The SENOTS program and battery', Psychology and Aging 4, pp. 113–118.
Stones, M. J. and A. Kozma: 1991, 'A magical model of happiness', Social Indicators Research 25, pp. 31–50.
Stones, M. J. and A. Kozma: 1994, 'The relationships of affect intensity to happiness', Social Indicators Research 31, pp. 159–173.
Stones, M. J., A. Kozma, T. E. Hannah and W. A. McKim: 1991, 'The correlation coefficient and models of subjective well-being', Social Indicators Research 24, pp. 13–23.
Stones, M. J., C. Rattenbury and A. Kozma: 1995, 'Empirical findings on reminiscence', in B. K. Haight and J. Webster (eds.), The Art and Science of Reminiscing: Theory, Research, Methods, and Applications (Taylor & Francis, Washington, D.C.).
Veenhoven, R.: 1984, Conditions of Happiness (Reidel, Dordrecht, Holland).
Veenhoven, R.; 1994, 'Is happiness a trait? Tests of the theory that a better society does not make people any happier', Social Indicators Research 33, pp. 101–160.
Wierzbicki, M.: 1986, 'Similarity of monozygotic and dizygotic twins in level and lability of subclinically depressed mood', Journal of Clinical Psychology 42, pp. 577–585.

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