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Internal and External Determinants of Subjective Well-Being: Review and Policy Implications

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Starting in the 1970s, political scientists have challenged the common practice to rely exclusively on economic indicators (e.g., GDP) to measure progress and development (Andrews and Withey 1976; Campbell, Converse & Rodgers 1976; Cantril 1965; Michalos 1985). One problem of the reliance on purely economic indicators is that increased economic progress does not guarantee greater well-being. For example, at the moment many people in developed countries are concerned that outsourcing and globalization decrease their subjective well-being even though it may increase their countries' GDP. Social indicators that assess people's subjective well-being addresses this limitation of economic indicators. In recent years, public policy makers have recognized the importance of subjective indicators of well-being for public policy decisions (Bönke 2005). As noted by Bönke (2005), public policy intervention implicitly or explicitly "not only aims at increasing material living conditions, but also at improving individual well-being in a general sense." (p. 5).

This chapter discusses several issues that need to be addressed before indicators of subjective well-being can be used to guide and evaluate public policy. These issues are (a) the definition of subjective well-being, (b) the validity of subjective well-being indicators, and (c) the responsiveness of subjective well-being to environmental changes.

The definition of subjective well-being

The concept of well-being implies that people's lives vary along an evaluative dimension that ranges from an extremely undesirable life (terrible) to an extremely desirable life (excellent). Like any evaluation, evaluations of people's lives require an assessment of what the life of

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an individual is actually like (e.g., married, employed, living in a small town, has many friends) and a comparison of a life's actual aspects to the ideal life (e.g., being married, employed, living in a small town, and having many friends).

It is useful to distinguish three major approaches to the assessment of well-being that differ fundamentally in the way lives are evaluated. The first approach specifies a number of basic and universal needs and assesses to which extent an individual's life meets these needs. The list of needs may include basic needs such as food and shelter or more advanced needs such as the need for social relationships and belonging (Baumeister & Leary 1995), autonomy (Deci & Ryan 1985), and meaning (Peterson, Park & Seligman 2005). A critical examination of this approach from a philosophical/normative perspective reveals some shortcomings of this approach (Sumner 1996). For example, non-basic needs and values vary across individuals and cultures (Inglehart 1997; Oishi, Schimmack, Diener & Suh 1998; Oishi, Hahn, Schimmack, Radhakrishnan, Dzokoto & Ahadi 2005; Schwartz 1992). Thus, the same level of fulfillment of a need may reflect different levels of well-being because fulfillment of a less important need has a weaker effect on well-being (Brunstein 1993; Diener & Fujita 1995; Michalos 1985). A more sensible approach would therefore require different lists of needs for different individuals or individuals' would have to give different weights to different needs (Tiberius 2004). However, even a predefined list of needs may fail to capture aspects that are relevant to an individual's well-being, and the risk is that an existing measure captures needs that are deemed important by the researcher rather than by the respondent (Tiberius 2004).

The second approach defines and measures well-being in terms of people's hedonic experiences (Kahneman 1999). This approach has a long history in the philosophical tradition of hedonism (Bentham 1948). Many contemporary philosophers have rejected hedonism as a theory of well-being (cf. Sumner 1996). Sumner (1996) lists several reasons for the decline of hedonistic theories of well-being in philosophy. One problem of hedonism is the unresolved questions about the nature of hedonic experiences. Hedonism assumes that all experiences share a homogeneous feeling tone that makes all experiences comparable in terms of their hedonic quality. This view of hedonic experience is expressed in Kahneman's (1999) notion of instant utility, which is the result of a continuous evaluation of one's environment. With increasing instant utility, experiences become more pleasant and with decreasing instant utility, experiences become more unpleasant.

Viewed this way, hedonic experiences provide a common metric that make all experiences comparable. A pleasant experience based on the instant utility of eating vanilla ice cream leads to higher well-being if this experience is more pleasant than another experience regardless of whether this experience is based on eating chocolate ice cream, winning a contest, or getting a phone call from a friend.

One problem with this account is that the existence of a common feeling of pleasantness or unpleasantness can be questioned. For example, although some emotion researchers argue that emotions can be reduced to a hedonic core (e.g., Ortony, Clore & Collins 1988), others argue for the existence of distinct emotions (Oatley & Johnston-Laird 1987). In the latter case, it would be difficult to compare instant utility across qualitatively distinct experiences. That is, does a moderately intense experience of anger have a stronger or weaker effect on well-being than a moderately intense experience of sadness (see, e.g., Frijda, Ortony, Sonnemans & Clore 1992)? Furthermore, it is by no means clear that the appraisal of instant utility produces only a single affective experience. People can be in a good mood and at the same time have an unpleasant sensory experience (Schimmack 2001), or have two concurrent emotional experiences (Larsen, McGraw & Cacioppo 2001; Larsen, McGraw, Mellers & Cacioppo 2004; Schimmack & Colcombe, in press). In sum, a hedonic theory of well-being makes some fundamental assumptions about the nature of hedonic experiences that have not been confirmed by emotion researchers.

A more serious problem for hedonic theories of well-being is the possibility that people may choose a less pleasant experience over a more pleasant one (cf. Sumner 1996). A study by Lang, Greenwald, Bradley, and Hamm (1993) nicely illustrates this problem. In this study, participants could see emotional slides for as long as they wanted. The slides differed in their level of hedonic valence and arousal. A hedonic theory predicts that participants would watch pleasant pictures for a long time and unpleasant pictures for a short time to maximize hedonic experiences. Contrary to this prediction, viewing times were determined by arousal and participants often chose freely to look for a longer time at extremely unpleasant pictures (e.g., mutilations, accident victims). Cross-cultural research also suggests that people differ in the importance that they place on hedonic experiences (Rozin 1999; Schimmack, Radhakrishnan, Oishi, Dzokoto & Ahadi 2002; Suh, Diener, Oishi & Triandis 1998). People in individualistic cultures (e.g., the United States) place a greater emphasis on hedonic experiences in life satisfaction judgments than people in collectivistic cultures (e.g., Mexico).

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This cultural difference may be related to the shift from materialistic to post-materialistic values with increasing development (Inglehart 1997). Finally, everyday examples also suggest that people are sometimes willing to forgo pleasure for the pursuit of other goals. Many major achievements and humanitarian acts (e.g., running a marathon, helping during a humanitarian crisis, caring for a baby) involve unpleasant experiences. For example, a rescue worker after a disaster may work for days and encounter dozens of dead bodies to find a single child that is alive. I think it is unlikely that the one moment of joy outweighs the days of misery in a simple summation of hedonic experiences. Nevertheless, a rescue worker may weigh the moment of joy more heavily and downplay the times of misery. In this hypothetical scenario, the hedonic balance of actual affective experiences would be a misleading indicator of the individual's sense of well-being.

Finally, hedonic theories of well-being share a common problem with other theories of well-being discussed so far. Namely, the theory imposes a common standard on all individuals. It merely replaces money or fulfillment of a particular need with the amount of pleasant over unpleasant experiences. Some people may reject this standard and evaluate their lives differently. In this sense, hedonic measures of well-being are not really subjective because they fail to give individuals the right to evaluate their lives based on their own standards. For example, an individual with a dispositional tendency to experience unpleasant moods (e.g., neuroticism) may realize that his affective balance provides negatively bias information about the actual quality of his or her life and therefore decide to evaluate his or her well-being as more favorable than his or her hedonic balance would suggest.

The third approach of measuring well-being addresses this limitation. In this approach, participants are asked to make a global evaluation of their own lives (Andrews & Whithey 1976). These evaluative judgments are commonly called life satisfaction judgments (Diener 1984). Although the notion of satisfaction may imply that life satisfaction is also a hedonic measure, actual measures of life satisfaction do not assess people's feelings of satisfaction. Rather, they ask people to make an evaluative judgment on a scale from terrible to excellent or from highly undesirable to highly desirable. Importantly, respondents are not given a set of criteria to make these judgments. Rather, they are asked to think about the most important aspects of their lives and to evaluate them based on their own subjective standards (Diener, Emmons, Larsen & Griffin 1985). For example, one individual may think about income and judge it based on the ability to provide food

and shelter for herself and her family. Another individual may think about income and evaluate it based on a comparison to his co-workers income. A third individual may not think about income, but may think about his marital relationship. Thus, life satisfaction judgments are conceptually most appropriate to obtain a subjective evaluation of an individual's life from the perspective of the individual whose life is being judged. However, the open and global nature of these judgments raises concerns about the validity of actual life satisfaction judgments. Actual life satisfaction judgments may provide false information about individuals' well-being when respondents fail to answer life satisfaction questions according to the normative model of life satisfaction judgments. For example, individuals may fail to consider some important aspects of their lives; they may use inappropriate weights for the importance of different domains, or they may base their judgments on unimportant information. Thus, life satisfaction *judgments* may not be valid measures of well-being, even though life satisfaction is a good indicator of well-being.

In sum, there exist a variety of approaches to the measurement of well-being. From a normative perspective, the most appropriate measure are life satisfaction judgments because they completely leave the task of evaluation to the individual whose life is being evaluated. However, a more pragmatic approach recognizes that all approaches have strengths and weaknesses and can be useful complements of economic indicators. If all indicators show similar results, one can be assured that the results are valid. For example, if all measures show a negative relation with unemployment, there is strong evidence that unemployment is associated with lower well-being. However, if different measures show different results, it becomes important to examine carefully the different normative assumptions that are being made by different measures of well-being. For example, if privatization of retirement funds increases autonomy, but decreases life satisfaction, the finding may suggest that the normative assumption that more autonomy by definition increases well-being may be false.

The validity of life satisfaction judgments

Validity is a technical term in the social sciences. It essentially means that a measure is accurate and measures what it is intended to measure. Just like a scale is supposed to provide an accurate measure of weight and not intelligence, and an IQ test should provide an accurate measure of intelligence not weight, a life satisfaction measure should

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measure life satisfaction. While it is relatively easy to assess whether a scale provides an accurate measure of weight, it is more difficult to assess whether an IQ test is a good measure of intelligence. It may seem even more difficult to determine whether a life satisfaction measure is a valid measure of life satisfaction because life satisfaction is subjective. Due to the subjective nature of life satisfaction, it is impossible to directly confirm the validity of life satisfaction judgments. Thus, validation of life satisfaction judgments relies heavily on the indirect approach of finding evidence that disconfirms their invalidity.

One major concern about life satisfaction judgments is that people may be unwilling or unable to judge their lives according to the normative model which prescribes that they carefully select the most relevant aspects of their lives and carefully evaluate these aspects based on a careful selection of subjectively chosen standards and then rationally integrate this information into an overall judgment. Alternatively, people may rely on a simple heuristic to deal with the apparent complexity of the task. People may rely on one of two heuristics, which would both severely undermine the validity of life satisfaction judgments. They may either judge their life satisfaction based on their current mood (Schwarz & Clore 1983) or they may rely on a single aspect of their life that is particularly salient at the moment (Schwarz & Strack 1999; see Schimmack & Oishi 2005, for a review). As people's moods are highly variable from one day to another, mood effects on life satisfaction judgments would render life satisfaction judgments invalid. If Bob is in a good mood on Monday and reports high life satisfaction and Bob is in a bad mood on Tuesday and reports low life satisfaction, the judgment would tell us about Bob's mood, but not about Bob's general evaluation of his life.

The good news is that neither heuristic provides an adequate account of the process how people respond to life satisfaction questions in surveys that provide public policy makers with information about citizens' well-being (e.g., Bönke 2005). This conclusion is supported by several research findings. First, in typical assessment situations current mood has negligible effects on life satisfaction judgments (Eid & Diener 2004; Schimmack, Oishi & Diener 2002). Second, a momentarily salient life domain does not have a dominant influence on life satisfaction judgments. This has been shown in studies that manipulate the order of a life satisfaction judgment and a judgment of a particular life domain (e.g., marital satisfaction). The correlation between the global and the domain judgment does not vary substantially with the order in which the judgments are made (Schimmack & Oishi 2005). Thus, just answer-

ing a question about marital satisfaction does not lead individuals to judge life satisfaction solely on the basis of marital satisfaction. Third, the retest stability of life satisfaction judgments over a period of a few months is high. Thus, judgments appear to be based on the same information even though the mood and the situation have changed. The relevance of these threats to the validity of life satisfaction judgments for public policy decisions is further diminished by the fact that public policies are aimed at groups of individuals rather than a single individual. Averaging across respondents will typically eliminate any effects due to mood or momentarily accessible information. Finally, it is possible to take a few simple precautions to reduce the chance that life satisfaction judgments are distorted by mood or momentarily salient information. For example, it is desirable to assess life satisfaction before questions about specific life domains and it is possible to discourage participants from using their current mood to judge life satisfaction (Schimmack, Diener *et al.* 2002).

The evidence reviewed above is necessary but not sufficient to demonstrate the validity of life satisfaction judgments. For example, people may report the same level of life satisfaction across situations and time because they always respond in a social desirable manner or answer consistently, but not in accordance with the normative model. Schimmack and Oishi (2005) examined the relation between global life satisfaction judgments and a judgment task that simulates the normative model. In this task, respondents first listed the five most important aspects of their lives. They then rated how satisfied they were with each of these five aspects. In accordance with the normative model of life satisfaction, this task lets respondents choose the aspects that define their lives and respondents can evaluate them according to their own standards. The study revealed a fairly strong correlation ($r = .70$) between the typical global judgments of life satisfaction and the normative judgment task. Furthermore, the order of the two types of judgments had a negligible effect on the correlation. A content analysis of the listed life domains showed that the respondents, who were students, frequently mentioned aspects that are important in students' lives such as academic achievements, family relationships, friendships, and romantic relationships. Thus, the high correlation cannot be attributed to a deviation from the normative model on both tasks.

One possible reason for the high correlation between the two measures of life satisfaction could be response styles. If some people prefer to use extreme scores and others avoid using extreme scores, mere individual differences in the use of the response scale will inflate the

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correlation between the two tasks in the previously reviewed study. Schimmack and Oishi (2005) addressed this concern by examining the correlation between global life satisfaction judgments and important life domains (e.g., family relationships) and unimportant life domains (e.g., weather). Response styles should produce a correlation independently of the importance of a domain, whereas the normative model of life satisfaction predicts stronger correlations between life satisfaction judgments and important domains than unimportant domains. A study that manipulated the importance of domains confirmed the prediction of the normative model (see also Schimmack, Diener *et al.* 2002). Thus, response styles have a negligible influence on life satisfaction judgments. Furthermore, even minor effects of individual differences in response styles have no effect on averages across individuals, which are typically of interest in a public policy context (response styles that are shared by a group of individuals are examined below). One limitation of existing life satisfaction measures is the exclusive reliance on positively scored items ("I am satisfied with my life"). Schimmack, Oishi and Diener (2006) are currently addressing this concern by developing a life satisfaction measure with reversed items ("I am dissatisfied with my life"). Preliminary results show that positive and negative items are highly negatively correlated and form a single factor. This finding suggests that the lack of reverse scored items on existing measures is not a threat to the validity of these life satisfaction judgments.

Another threat to the validity of life satisfaction is social desirable responding. People may feel uncomfortable to reveal that they are dissatisfied with their lives. They may even use various strategies or defense mechanisms to distort their own perceptions of their life satisfaction (Paulhus 1984). Social desirable responding may account for some of the discrepancies between self-reports and informant reports. However, it has been difficult to separate social desirable responses from valid responses of high life satisfaction in studies of individual differences. In contrast, it has been easier to document some influence of social desirable responding across different survey methods. As noted by Joar Vittersø (personal communication, October 2005), the percentage of very happy people in Norway has been consistently between 19 and 23% in ten national surveys over the past 30 years that used paper-pencil tests. Using the same question, face-to-face interviews obtained a percentage of 30 on the same item. This finding suggests that truly anonymous measures are more valid because they minimize the problem of social desirable responding. However, not all studies show effects of the assessment method (see Diener & Suh

1999). Furthermore, these effects would not influence comparisons of surveys that use the same assessment strategy. For example, it would still be possible to show that a public policy intervention produced an increase in life satisfaction in a pre-post comparison of two face-to-face assessments.

So far, the assessment of validity has been based solely on self-report data. These findings can demonstrate internal validity; that is, life satisfaction judgments relate to other responses by the same individual in a manner that is consistent with the normative model of life satisfaction. However, internal validity is not sufficient to demonstrate that life satisfaction judgments are valid indicators of life satisfaction. If life satisfaction judgments are valid, they should also reveal external validity; that is meaningful relations to measures that are not based on responses by the same person. It is unsatisfactory to argue that life satisfaction judgments are by definition valid measures of life satisfaction because life satisfaction is subjective. At the same time, the subjective nature of life satisfaction makes it more difficult to examine the external validity of life satisfaction judgments because low correlations between an external variable (e.g., income) and a life satisfaction judgment may be due to the fact that life satisfaction is not related to an external variable.

The most widely accepted and most appropriate external validation criterion for life satisfaction judgments are judgments by knowledgeable informants. Knowledgeable informants are likely to have at least limited access to information that allows them to judge another individual's life satisfaction. This information can be based on verbal cues (e.g., a husband complains about work) or non-verbal cues (e.g., a daughter is cheerful and upbeat in her expressions). At the same time, it is reasonable to assume that informants' knowledge about an individual's life satisfaction is limited. For example, informants may not know the weights that an individual attaches to different life domains. Thus, correlations between self-ratings and informant ratings are likely to underestimate the validity of self-reported life satisfaction. A review by Pavot and Diener (1993) shows that correlations between self-ratings and informant ratings typically range from .40 to .50. Under the assumption that both measures are a combination of the true level of life satisfaction and measurement error, this finding suggests that at least 40% of the variance in self-reported life satisfaction is valid. The discrepancy between self-reports and informant reports provides an important avenue for future research to increase the validity of self-report measures of life satisfaction.

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Further evidence for the external validity of life satisfaction judgments is provided below when I review the evidence regarding internal and external determinants of life satisfaction. Any finding that shows that life satisfaction judgments are systematically related to internal and external causes implies that the measure was valid because an invalid measure would fail to show systematic and theoretically predicted relationships with other variables.

Determinants of life satisfaction

It is important to distinguish between internal and external determinants of life satisfaction. Internal determinants are factors within an individual that cause him or her to have a particular level of life satisfaction independent of an individual's environment. External determinants are factors within an individual's environment that influence the individual's well-being. The distinction between internal and external determinants is particularly relevant for the use of life satisfaction judgments by public policy makers because public policies typically focus on interventions that change people's environments (e.g., increase taxes, providing health care, etc.). To the extent that life satisfaction is determined by internal factors, public policy makers may be unable to increase citizens' well-being. Even if it were possible for public policy makers to influence internal determinants of life satisfaction, these interventions would raise serious practical and ethical concerns. For example, a disposition to experience depressed moods is associated with lower life satisfaction (Schimmack, Oishi, Furr & Funder 2004). Furthermore, it has been shown that negative mood states can be reduced by means of drugs for the treatment of clinical depression even in normal, non-depressed individuals (Knutson *et al.* 1998). Thus, public policies that would make these drugs accessible for everybody could in theory raise life satisfaction. A first objection to this intervention could be that in some cases the unpleasant mood may be a valid reflection of lower well-being (e.g., feeling sad after the loss of a loved one). In these cases, a drug-induced decrease in unpleasant feelings would not necessarily imply an increase in well-being because the lack of unpleasant feelings is not a valid reflection of the individual's life circumstances (Sumner 1996). Thus the administration of drugs or other interventions that merely enhance people's feelings without enhancing their actual lives is not a realistic option for public policy makers. Thus, a careful assessment of the strength of these factors is important to formulate realistic goals for the effects of public policy on citizens' well-being.

Internal determinants of life satisfaction

Internal causes produce individual differences in life satisfaction in the absence of variability in life circumstances. For example, two individuals with the same income may have different levels of income satisfaction. Internal determinants can also produce the same level of life satisfaction in individuals with different life circumstances. For example, two individuals with different levels of income may have the same level of satisfaction with income. It is also possible to distinguish proximal and distal internal determinants of life satisfaction. Proximal internal determinants can be adaptation processes (e.g., ideal income increase with actual income) whereas distal processes can be genetic factors (e.g., a genetic disposition to experience unpleasant moods).

Psychological research over the past thirty years revealed strong effects of internal determinants of life satisfaction. In a widely cited article, Lykken and Tellegen (1996) even proposed that trying to raise life satisfaction is as futile as trying to be taller. A review article by Diener, Suh, Lucas, and Smith (1999) concluded that the evidence for internal determinants of life satisfaction is much stronger than the evidence for external determinants of life satisfaction.

Evidence regarding distal internal determinants of life satisfaction stems largely from twin studies. In adoption-twin studies, any similarity between twins raised apart must be due to their shared genes (an internal determinant) as they grew up in different environments. In non-adoption studies it is more difficult to separate environmental (external) and genetic (internal) determinants of life satisfaction, but greater similarity between monozygotic than dizygotic twins suggests a genetic contribution. Few studies have examined the genetic contribution to pure measures of life satisfaction. More studies have examined the genetic contribution to personality variables that predict life satisfaction (e.g., extraversion, neuroticism), but the results are fairly consistent across different measures. In general, about 40% of the individual differences in well-being are due to genetic variability (Lykken & Tellegen 1996; Roysamb, Harris, Magnus, Vitterso & Tambs 2002). Moreover, these studies also suggest that growing-up in the same household has virtually no effect on life satisfaction later in life.

An estimate of 40% genetic contribution seems to suggest that the remaining 60% of the variance is due to environmental factors. However, this is likely an overestimation of the importance of external factors because it assumes that life satisfaction judgments are 100% valid. In other domains, such as the measurement of personality, the

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genetic contribution increases from 40% to 70% in studies that use multiple methods (e.g., self-ratings and informant ratings) to eliminate systematic measurement error in self-ratings (Rieman, Angleitner & Strelau 1997). Thus, the heritability of life satisfaction is likely to be greater than 40% as well.

It is important to avoid misinterpretations of high heritability estimates as evidence that environmental factors are not important. One problem of heritability estimates is that they can only reflect how much variability within a population (typically individuals in a specific culture during a specific historic period) is due to genetic versus environmental factors. As a result, heritability estimates fail to consider environmental factors that produce variability across cultures and historic periods (reviewed below). To illustrate this fact, it is interesting to note that various characteristics such as height, body mass index, and intelligence have heritability estimates of 70% or higher. At the same time, all three measures have shown increases over time (Flynn 1987; Freedman *et al.* 2002). As historic changes over short periods of time within a population cannot be attributed to genetic factors, these increases suggest that it is still possible to raise well-being even if heritability is very high.

In sum, there is strong evidence that genetic factors contribute to individual differences in life satisfaction. This finding provides some external validity to measures of life satisfaction. At the same time, the finding suggests that some determinants of life satisfaction are not under the control of public policy makers. However, the evidence does not support the claim that genetic determinants are so strong that public policies are unable to raise life satisfaction.

Another important internal determinant of life satisfaction is revealed in studies that show adaptation to changing life circumstances. While adaptation to negative changes in life circumstances is beneficial and helps people to maintain life satisfaction during times of adversity, adaptation to positive changes in life circumstances may undermine positive effects of public policies. There is strong evidence that the effects of single life events (e.g., car accident, buying a car, achieving a particular goal, failure on a particular task) on life satisfaction are short-lived and do not last more than a few months (Suh, Diener & Fujita 1996). Thus, a single tax-refund or even international events like the SARS crisis are unlikely to have lasting effects on life satisfaction.

More controversially, adaptation theory suggests that people's sense of well-being adjusts to long-term changes in objective life circumstances (see Frederick & Loewenstein 1999, for a review). For example,

a widely cited study by Brickman, Coates, and Janoff-Bulman (1978) showed an unexpectedly small difference between a group of quadriplegics and paraplegics and a normal control group only a few months after the former group's life changed dramatically. This process of habituation may counteract public policy interventions that produce actual improvements in the short-term.

Internal determinants of life satisfaction such as genetic dispositions and habituation may explain why life satisfaction in many countries has remained quite stable since the first assessment of life satisfaction in these countries (Hellevik 2003), although a slight positive trend can be detected in several countries (Hagerty & Veenhoven 2003; Veenhoven, this volume). Adaptation processes provide a serious challenge to the aim of public policy makers to increase well-being. The subsequent review of research on external determinants of life satisfaction addresses this concern. It shows that people do not adapt to all life circumstances and provides insights into some of the determinants of life satisfaction that are in principle under the control of public policy makers.

External determinants of life satisfaction

The strongest evidence for external determinants of life satisfaction stems from cross-cultural comparisons of life satisfaction (Diener & Diener 1995; Fahey & Emer 2004). Cross-cultural studies not only show large differences in life satisfaction across nations. These differences are also remarkably stable across different surveys and over time (Veenhoven, this volume). In addition, national differences in life satisfaction are meaningfully related to desirable characteristics of nations such as wealth, freedom, observance of human rights, good education and health (Diener & Diener 1995).

Researchers disagree about the exact relationship between wealth and life satisfaction. Some researchers argue that wealth increases life satisfaction only up to a certain point after which further increases in wealth no longer contribute to life satisfaction. This theory, however, is inconsistent with the observation that eight of the ten richest nations are also among the ten happiest nations (Canada, Iceland, Ireland, Denmark, Luxembourg, Norway, Switzerland, USA). The exceptions are Austria and Hong Kong, which are among the ten richest but not happiest "nations", and the Netherlands and Sweden, which are among the ten happiest nations, but not among the ten richest nations. Even among the nations with a PPP of over 25,000 in 2004, there is still a positive correlation between wealth and life satisfaction.

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Due to the high correlation between wealth and other desirable characteristics it has also been difficult to determine which of these variables is the actual cause of higher life satisfaction (assuming that cultural characteristics cause life satisfaction). Nevertheless, the findings strongly suggest that life satisfaction is influenced by external factors of the social and economic environment.

To the extent that national differences in life satisfaction merely mirror national differences in objective indicators of nations' development, these findings suggest that it is unnecessary to complement traditional indicators of well-being with subjective indicators such as life satisfaction. However, the fact that national differences in objective well-being account only for some of the variance in life satisfaction, suggests that subjective indicators are important for one of two reasons. First, economic indicators of wealth such as PPP are imperfect measures of individuals' wealth for various reasons (e.g., Diener & Tov, in press). For example, GDP can be divided into companies, governments, and household's wealth (or debt). In Japan, GDP has increased due to company profits, whereas government's and households' wealth have decreased. This may explain why Japanese citizens are less satisfied than Japan's total GDP predicts because company profits are unlikely to translate into greater well-being of citizens. The second reason for the value of subjective indicators is that economic indicators may not track external determinants of life satisfaction that do not involve monetary transactions (e.g., volunteer work, free access to information on the web; the pleasure of sharing a meal rather than eating two meals separately).

One of the most powerful demonstrations of the influence of cultural change on life satisfaction is a notable increase in life satisfaction in the former German Democratic Republic (Eastern Germany) after unification with the Federal Republic of Germany (Frijters, Haisken-Denew & Shields 2004). A closer analysis suggests that wealth made a substantial contribution to this increase, but other factors not reflected in GDP also contributed.

In sum, national differences in life satisfaction provide strong evidence for the influence of external determinants on life satisfaction. Furthermore, the evidence that national differences in life satisfaction are highly correlated with nations' desirable characteristics such as wealth, freedom, and observance of human rights, the evidence supports the validity of life satisfaction judgments and points towards public policies that can raise life satisfaction, especially in nations with low levels of life satisfaction. At the same time, the discrepancy

between economic indicators and life satisfaction suggests that life satisfaction measures can play an important role to reveal biases in the economic indicators and to point to additional environmental factors that influence life satisfaction.

Another well-documented external determinant of life satisfaction is unemployment (Bönke 2005; Lucas, Clark, Georgellis & Diener 2004; Gallie & Russell 1998). Importantly, longitudinal evidence demonstrates that this relation reflects a causal influence of unemployment on life satisfaction. Lucas *et al.* (2004) showed in a prospective panel study that a change in employment status produced a change in life satisfaction. Specifically, life satisfaction decreased sharply when participants' were laid off. Also consistent with adaptation theory, life satisfaction increased again even when people remained unemployed, but it did not return to individual's original level of life satisfaction. Another important finding in this study was that the effect of unemployment on life satisfaction remained even after taking changes in income into account. Thus, it seems that other aspects of unemployment (e.g., a feeling of worthlessness) are important determinants of life satisfaction. These findings have straightforward policy implications. Although many governments are aware of the problems of unemployment and try to reduce unemployment, the finding that unemployment has scientifically documented effects on people's sense of well-being gives this policy goal additional urgency.

The search for additional external determinants of life satisfaction has been disappointing so far (Diener *et al.* 1999). The reason for this may be the complexity and diversity of determinants of individual's life satisfaction. For some people, the availability of museums and theatres may be very important for their life satisfaction; for many others it is not. People with children will care about child-care facilities, playgrounds, and the quality of schools; others will not be affected. Thus, any single environmental factor is likely to make a small contribution to the life satisfaction of large groups or whole nations. This does not mean, however, that environmental factors are not important or that public policy initiatives are futile. Nevertheless, it is discouraging to search for external determinants of life satisfaction with the lingering doubt in one's mind that most of the environmental effects are idiosyncratic random events with short-lived effects on life satisfaction (e.g., a loved-one dies; getting an unexpected salary raise). The large estimate of environmental effects in twin studies provides only weak support for the importance of environmental factors because this estimate is inflated to an unknown extent by measurement error.

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Subsequently, I review two lines of evidence that suggest that external determinants of life satisfaction are important and that a closer study of the processes by which environmental factors influence life satisfaction is a fruitful avenue for future research.

The first evidence is based on studies that track the longitudinal stability of life satisfaction. Fujita and Diener (2005) examined the stability of life satisfaction in the German panel study reviewed above (Lucas *et al.* 2004). They found that stability decreased from $r = .55$ over a one-year interval to $r = .23$ over 16 years. These correlations underestimate stability because they are based on a single-item measure. Adjusted for an estimated reliability of .7 (Schimmack & Oishi 2005), the true stabilities may be .79 over one year and .33 over 16 years. A meta-analysis by Schimmack and Oishi (2005) showed that multiple item scales indeed have a higher short-term stability ($\sim .70$ over 1 year) and decrease to a level of about .30. This information provides information about the contribution of environmental factors to life satisfaction, if one can make assumptions about the contribution of internal and external determinants to stability and change in life satisfaction. Longitudinal behavioral genetics studies suggest that in adulthood genes contribute nearly exclusively to stability and often have no effect on change. In other words, the same genes have the same effect over the course of adulthood. As a result, environmental factors account for all of the systematic change in life satisfaction. Based on these assumptions, we would estimate that genetic factors account for the 30 to 40% of the variance that is stable over long-time intervals, which is consistent with Lykken and Tellegen's (1996) findings. However, external factors account for the remaining 30–40% of the variance that is stable in the short term, but changes in the long term; that is, the difference between the stability over 1 year and 16 years.

The finding of systematic changes in life satisfaction over time is encouraging, but does not conclusively demonstrate external determinants of life satisfaction. It is also possible that people change the way they evaluate their lives. For example, people may pay more attention to health when they grow older. Future longitudinal studies need to uncover how much actual changes in people's environment (e.g., unemployment) account for these changes, and how much they are due to changing internal determinants. Moreover, complex interactions between internal and external factors can also contribute to these changes (Diener *et al.* 1999).

Schimmack, Pinkus, and Lockwood (2006) proposed another approach to examine the contribution of external determinants to life

satisfaction by examining the similarity in life satisfaction between individuals who share a common environment. Similarity in life satisfaction provides important information about environmental determinants of life satisfaction. If, for example, individuals who share the same environment are not more similar to each other in life satisfaction than individuals from different environments, one can be fairly confident that the environmental differences have no effect on life satisfaction. On the other hand, similarity suggests that the environment makes a contribution, although one has to carefully rule out alternative explanations. A concrete example of this logic is the previously reviewed evidence about national differences in life satisfaction. The fact that the mean level of life satisfaction in one nation is different from the mean level of life satisfaction in another nation implies that individuals from the same nation are more similar in life satisfaction than individuals from two different nations. The same logic is also used in behavioral genetics studies. Here the evidence that MZ twins reared together in the same environment are not more similar than MZ twins reared in different environments is directly taken as evidence that the environment had no effect on twins' well-being (Lykken & Tellegen 1996). Schimmack *et al.* (2005) examined similarity in life satisfaction of married couples. The advantage of married couples over other dyads (e.g., siblings, parent-child) is that spouses are not genetically related. Thus, the predicted similarity on the basis of spouses' genetic relatedness is zero. At the same time, spouses share a highly similar environment and mutually shape each other's social environment. Thus, spouses should have similar levels of life satisfaction if environmental factors contribute to life satisfaction.

The most impressive data on spousal similarity in life satisfaction were obtained from a study of over 15,000 married couples (Tambs & Moum 1992). Participants completed a five-item measure of life satisfaction. The measure had a retest stability of .68 over an average time interval of two years. This study obtained a correlation of $r = .37$ between husbands' and wives' life satisfaction. Subsequent studies have reported similar or even higher correlations (Kurdek 1997; Schimmack *et al.* 2005). Thus, there is strong evidence for spousal similarity in life satisfaction. Unfortunately, spousal similarity in life satisfaction does not provide a direct estimate of the magnitude of environmental effects on life satisfaction because different causal processes can lead to spousal similarity in life satisfaction.

Schimmack *et al.* (2005) examined the contribution of marital quality to life satisfaction. Marital quality was assessed by means of a

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latent factor based on husbands' and wives' reports of relationship closeness (e.g., "My partner and I are very close"). The assumption of this modeling approach is that spouses' agreement in judgments about their marital relationship reflects the actual quality of the relationship. Relationship quality predicted 19% of the variance in life satisfaction. One alternative explanation for this finding could be that internal factors cause relationship quality and in turn life satisfaction. Several findings render this explanation unlikely. Heller, Watson, and Hies (2004) demonstrated in a meta-analysis that marital satisfaction predicted life satisfaction above and beyond the influence of personality traits such as neuroticism and extraversion. Lucas, Clark, Georgellis & Diener (2003) examined the influence of marriage on life satisfaction in a prospective panel study. Although marriage had no main effect on life satisfaction (after a two-year honeymoon period), it set individuals on different trajectories with lasting changes in life satisfaction. Whereas some individuals' life satisfaction increased, the life satisfaction of others decreased. These changes in life satisfaction over time cannot be attributed to internal determinants of life satisfaction. Furthermore, Pinkus, Schimmack & Lockwood (2006) found in a follow-up study of their married couples that changes in life satisfaction of one spouse predicted similar changes in the other spouse's life satisfaction. Further evidence stems from a behavioral genetics study of marital satisfaction (Spotts, Neiderhiser, Towers, Hansson, Lichtenstein, Cederblad, Pederson & Reiss 2004). The study showed that wife's genes contribute to wives' and husbands' marital satisfaction (and therewith to spousal similarity in marital satisfaction), but environmental factors made a substantial contribution to spousal similarity in marital satisfaction. Future research needs to uncover the nature of the environmental factors that are underlying these findings. These findings may point to public policy interventions that influence life satisfaction of married individuals via relationship quality.

Conclusion

Over the past decades, the social sciences have made tremendous progress in the scientific study of well-being. Life satisfaction has been a key measure of well-being in many influential studies and there is firm evidence that life satisfaction judgments are valid, although not perfect, measures of well-being. There is firm evidence that life satisfaction is partially determined by internal factors that are difficult or impossible to change. However, there is equally strong evidence that

external factors also contribute to well-being. The evidence is particularly strong in cross-cultural comparisons, which clearly point to the limitations of adaptation. However, even in societies where most people's basic needs are met, environmental factors continue to produce individual differences in well-being. The main agenda for well-being researchers in the coming decades will be the development of causal models that elucidate the nature of these environmental factors. These models can serve as the scientific foundation for public policies aimed at increasing well-being.

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