

12 Pathways through challenge: implications for well-being and health

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Introduction

In this chapter we explore how various life challenges influence psychological well-being and health. Our conception of life challenge encompasses both normative (typical, anticipated, planned) life transitions as well as nonnormative (atypical, unexpected, sometimes traumatic) life experiences. The individual difference variable we link to these challenges is psychological well-being. Drawn from depictions of positive functioning in developmental, clinical, and mental health literatures, well-being encompasses numerous dimensions of positive functioning (e.g., self-acceptance, quality of ties to others, mastery, purpose). The question thus is how these various aspects of well-being are affected by, or themselves affect, the experiential challenges that comprise an individual's life history.

Our chapter is organized into three sections, which in themselves, represent an evolving research program that began largely with questions in domains of life-course development and personality, and in recent years, has moved progressively in the direction of connecting life challenge and well-being to health. The first section is focused on single normative and nonnormative experiences of adulthood and aging, where we highlight findings from three categories of studies, which deal, respectively, with the parental experience in midlife, community relocation and caregiving in old age, and health challenges of later life. Across each of these, the focus is on how such experiences have impact on psychological well-being. The second section addresses cumulative profiles of life experience that combine both normative and nonnormative challenges. Here again, the focus is on the imprint of such long-term profiles of experience on positive psychological functioning. In the final section, we describe an unfolding program of studies that explores the implications of well-being for health. Framed as inquiries in "positive health," we examine the physiological substrates of flourishing, with emphasis on whether psychosocial strengths and successful negotiation of life challenges afford protection

against morbidity and early mortality. The construct of resilience emerges as a conceptual theme across these latter studies. The central scientific task therein is explication of how resilience comes about, i.e. identifying the processes that make it possible.

Normative and nonnormative challenges: implications for well-being

A mainstay of life-course research is the idea of age-graded roles and life tasks (Baltes, 1987; Brim and Ryff, 1980; Caspi, 1987). These refer to socially sanctioned, frequently prescribed (hence, the term “normative”) transitions that individuals expect to encounter as they journey across life. Such challenges are thus anticipated, they are frequently shared with others going through the same transition, and oftentimes, they are preceded by socialization processes that help individuals successfully negotiate the life change. Underscoring their age-graded features, there is also implicit understanding as to “when” such experiences should occur, which then creates perceptions at the individual level that one is “on-time” or “off-time” with regard to these normative experiences (Fallo-Mitchell and Ryff, 1981; Neugarten, Moore, and Lowe, 1965).

Juxtaposed with normative experiences are challenges and events that come unexpectedly and for which there may be little socialization. These nonnormative experiences include the voluminous literatures on stressful life events, but also encompass normative events that are experienced in atypical ways (e.g., giving birth to a child with a disability; having a spouse die in early adulthood). Nonnormative experiences are generally construed as having adverse influences on health and well-being, although there is growing interest in how some are able to thrive in the face of adversity and even benefit from it (Ickovics and Park, 1998; Krauss and Seltzer, 1999; Ryff, Singer, Love, and Essex, 1998).

Normative experiences, in contrast, are viewed as generally positive. Not only are they socially sanctioned (if not, prescribed) movement through these expected challenges of life can enhance well-being, such as perceptions of personal growth, mastery, purpose, and positive self-regard. That is, the usual “hurdles of life” (e.g., getting an education, finding a good job, marrying, having a family) provide the *experiential basis* for seeing growth and development in oneself through time, and in the process, acquiring new knowledge, skills, insight, and purpose.

We acknowledge that psychological strengths are not only consequences of successfully negotiated life challenges, but may also be significant contributors to how transitions are negotiated. Most of our investigations below examine the former question, but we also consider

the latter to underscore the reciprocities between life challenges and psychological well-being.

These initial studies focus on single experiences, three categories of which are discussed in this chapter. The first pertains to the parental experience in midlife; the second to community relocation and caregiving in later life; and the third to the experience of increased health problems with aging. Some of these (e.g., relocation, later life health problems) pose particularly interesting questions for well-being, because, although they are somewhat age-graded and typical, they may not be desired experiences. Hence, how they are negotiated adds further insight to the successful negotiation of life challenges that are normative, in the sense of frequently occurring and anticipated, but not necessarily sought after (e.g., retirement, widowhood). In addition to examining the import of these diverse experiences for well-being, we also describe various intervening mechanisms (e.g., social comparison processes, causal attributions, coping strategies) that help clarify individual differences among those who show high profiles of well-being following, or during, these experiences from those who do not.

The parental experience in midlife

Extensive research has been conducted on the topic of parenthood (see Bornstein, 1995), which for many is a central challenge of adult life. Many have studied the effects of parents on the development of their children, while others have examined how the experience of becoming a parent affects the development and well-being of parents themselves (Ryff and Seltzer, 1996). Most of this latter work has emphasized the transition into parenting – the early years of this experience when children are young and parents tend to be in early adulthood. Alternatively, gerontological researchers have focused on the later years of being a parent when adult children may assume caregiving roles (Hagestad, 1987; Rossi and Rossi, 1990). A neglected period of the parental experience is midlife, particularly when children are emerging as adults in their own right and parents are establishing adult-to-adult relationships with them.

Ryff and Seltzer (1996) brought together numerous investigators to examine the developmental challenges and issues of this midlife period in parenting. Within this forum, Ryff, Schmutte, and Lee (1996) targeted a particular question believed to have consequence for parents' well-being: namely, how their adult children "turn out." An earlier investigation (Ryff, Lee, Essex, and Schmutte, 1994) had begun this query by investigating in a community sample of midlife adults how their adult children (27 years of age on average) were doing, both in terms of their educational

and occupational accomplishments and their personal and social adjustment. The prediction was that parents whose grown children were doing well would be those with high levels of self-acceptance, purpose in life, environmental mastery, and autonomy (see Ryff, 1989, 1995 for summary of these key dimensions of well-being). Moreover, we brought social comparison processes into the evaluation, predicting that parents who saw their adult children as doing well as, or better than, themselves, would also have higher levels of well-being than parents who perceived their children had done more poorly than themselves.

Findings showed that parents' well-being (both mothers and fathers) was significantly predicted by how children had turned out, particularly in terms of their personal and social adjustment. Specifically, parents' ratings of self-acceptance, purpose in life, environmental mastery, personal growth, and positive relations with others were predicted by the perception that they had raised children who were self-confident, happy, and well-liked by others. To address the problem of source overlap (does parents' well-being bias how they view their children?), we also obtained data from spouses to validate that ratings of children's success or failure are not driven by parents' well-being (see Ryff, Lee, Essex, and Schmutte, 1994). Children's educational and occupational attainment also significantly predicted parents' self-acceptance, purpose in life, personal growth, and positive relations with others, but the effects were not as strong as for children's adjustment.

The social comparison influences added further intrigue to these findings. Parents' comparisons with their children were, in fact, significant predictors of their own well-being (above and beyond the effects described above), but these outcomes were in the *opposite* direction to what we had predicted. That is, parents who perceived that their children had done better than themselves had *lower* rather than higher well-being. Such effects pertained primarily to comparisons about personal and social adjustment, although for mothers, effects were also evident for comparisons about attainment (education, occupation). Such outcomes varied, however, as a function of mothers' level of education (i.e., there were significant interactions between mothers' education and their children's attainment in predicting their own well-being). Specifically, mothers with greater education had higher self-acceptance and purpose in life *if* their children's attainment was better than their own. However, for mothers with lower levels of education, having children with attainment profiles better than their own was associated with lower levels of self-acceptance and life purpose. Presumably, mothers who had experienced their own educational opportunities were more likely to "bask" in having children who exceeded their own achievement.

Ryff, Schmutte, and Lee (1996) added attributional perspectives by asking about the extent to which parents viewed themselves as *responsible* for how their grown children had turned out. Parents reported whether they took credit or responsibility for how well their children had done and indicated to what extent they viewed themselves as role models for their children as well as what their level of involvement had been across multiple domains of children's lives. The prediction was that parents would report differing levels of responsibility depending on how well children had turned out: those with successful children were hypothesized to report higher levels of responsibility than those with children who had not done so well. In addition, following attribution theory, we predicted that among parents of less successful children, their levels of well-being would be "protected" by their perception that they were not responsible for such outcomes.

The findings were again surprising. As predicted, parents who viewed their children as less successful in adjustment and attainment did, in fact, report lower levels of responsibility for these children. This attribution did not, however, protect parental well-being (by avoiding self-blame for negative outcomes). Rather, parents with the lowest levels of life purpose and mastery as well as the highest levels of depressive symptoms were those whose children had not turned out well *and* who reported low levels of responsibility and involvement with these children. We did not include questions about other external influences (e.g., peers, school); thus it was impossible to address whether parents of unsuccessful children might attribute these outcomes to external factors. What we did learn, however, was that attribution theory, when applied to the parental realm, seems to require modification. That is, parenting may invoke strong normative expectations in which parents believe they *should be* actively involved in and responsible for their children's lives. Thus, well-being can be undermined not only by having a child turn out poorly, but also by perceiving that one fell short of being a responsible and involved parent.

Schmutte and Ryff (1994) elaborated gender effects (mothers and fathers, sons and daughters) in the above analyses. Their findings showed that although parents did not report different levels of success for sons and daughters, parental well-being was more closely tied to success of sons. With regard to social comparisons, however, it was comparisons with daughters that were more strongly linked to parental well-being. Responsibility assessments showed cross-sex patterns: mothers' well-being was more strongly predicted by their ratings of responsibility for sons, while fathers' well-being was aligned with their ratings of responsibility for daughters. These findings were interpreted within contexts of gender-role

socialization as well as changing opportunity climates for women (see Ryff, Schmutte, and Lee, 1996).

A final perspective on the parental experience and well-being invokes more explicit developmental paradigms – specifically, the Eriksonian construct of generativity (Erikson, 1959; McAdams and de St Aubin, 1998). Generativity poses that a central challenge or task of the middle years of adulthood is to guide and direct the next generation. This can occur in the context of parenting, but may also apply to mentoring activities in one's workplace, or leadership roles in one's community. Generativity is now a flourishing arena of inquiry (see McAdams and de St Aubin, 1998; Ryff, Kwan, and Singer, 2001) in which life-course developmentalists are detailing its diverse forms and relating it to other aspects of personality as well as social structural influences. Keyes and Ryff (1998), for example, showed that the expression of generativity is contoured by social structural factors. That is, midlife and older adults with higher levels of education show more generative behavior and commitment, likely underscoring the role of differential access to resources and opportunity required to be a generative person. These authors further documented links between generativity and psychological and social well-being. High profiles of generativity were strongly linked with individuals' feeling good about themselves and judging their lives to be worthwhile and meaningful.

Community relocation and caregiving in old age

Relocation In contrast to parenthood, which is a continuous, ongoing normative experience, community relocation in later life is a discrete event that for many is an increasingly common transition. In the typical case, community relocation involves an aging woman or couple who are moving from the home they may have lived in for many years to an apartment or a retirement community. Not included in this research are moves signaling decline – i.e., relocation to nursing homes. While a typical later life transition, relocation at any period in the life-course is stressful. In old age, it is also a change that is sometimes “resisted.” Thus, relocation provides a useful example of a later life challenge that occurs with high frequency, but may be accompanied by ambivalent or negative expectations.

We have followed an aging sample of women ($N = 301$) through four waves of data collection punctuated by the relocation transition. Baseline data were obtained prior to their moves and on three occasions post-move (four-six weeks later, seven-eight months later, about 15 months later). This design has enabled tracking of actual changes in reported

levels of psychological well-being as well as other processes (e.g., social comparisons, coping strategies) thought to influence adaptation to this later life challenge. Importantly, these data have documented the dynamics of well-being, showing significant gains and losses in positive psychological functioning, even though the measures themselves are highly reliable (test-retest, internal consistency) (Ryff, 1989; Ryff and Keyes, 1995). Such variation, in contrast to more trait-like dimensions of personality (McCrae and Costa, 1990), renders well-being particularly informative for evaluating the impact of normative and nonnormative life challenges.

Ryff and Essex (1992) drew on Rosenberg's self-concept theory to specify the interpretive, or meaning-making activities, through which life experiences, like community relocation, might influence well-being. These include how individuals see themselves doing in multiple life domains relative to others (social comparisons), how they perceive that they are viewed by others across multiple life domains (reflected appraisals), and what they define as central to their own identities (psychological centrality). Kling, Ryff, and Essex (1997) used these differing assessments to investigate whether cross-time well-being is maximized by increasing the psychological centrality of domains in which one is doing well (measured by social comparisons and reflected appraisals) and decreasing the centrality of life domains in which one is doing poorly. Such changes in centrality would demonstrate flexibility in the self-concept, which may be needed to successfully negotiate life transitions. These predicted patterns were found in domains of health and friendships: women who enhanced the importance of these aspects of their self-definition in which they saw themselves doing well post-relocation, were those who showed *gains* in multiple aspects of well-being following relocation.

Psychological well-being is not only an outcome of life challenge, but also a contributing factor to how challenge is negotiated. To explore this possibility, Smider, Essex, and Ryff (1996) employed the longitudinal relocation data to investigate short-term emotional reactions to relocation based on pre-move psychological resources (i.e., well-being) as well as contextual factors surrounding the move itself (e.g., difficulty of the move, pressure to move, unexpected gains in moving). As predicted, pre-move levels of environmental mastery and autonomy buffered the effects of a difficult move and thereby reduced negative emotional reactions (sadness, aggravation) shortly after relocation. On the other hand, women with lower levels of autonomy and personal growth prior to the move experienced more of an emotional uplift (more optimism, less sadness) post-move when relocation involved high levels of unexpected gains. These

findings underscore the diverse ways in which psychological strengths and vulnerabilities influence how one enters particular life events and is subsequently affected by them.

Caregiving Another perspective on parenting and individual differences in well-being derives from a longitudinal program of research on aging parents who are caregivers for their adult son or daughter with developmental disabilities (Krauss and Seltzer, 1999; Seltzer and Ryff, 1994). Seltzer and Ryff (1994) clarified that while parenting is, in itself, largely a normative age-graded task, it can be and frequently is experienced nonnormatively. For example, one can give birth to a child with mental retardation, autism, or other forms of developmental disability, which may greatly transform the parental experience. It is not, however, just the transition to parenthood that likely differs in these cases, but also the middle and later years of the parental experience. And, it is not, as may be expected, inevitably the case that parental well-being is undermined by parenting in the nonnormative case (Seltzer, Krauss, Choi, and Hong, 1996; Von Riper, Ryff, and Pridham, 1992). Older mothers of adult children with mental retardation, for example, frequently appear more similar to than different from their peers with regard to multiple indicators of health and well-being.

Seltzer, Greenberg, Floyd, Pettee and Hong (2001), using data from the Wisconsin Longitudinal Study, found that whereas midlife parents of individuals with severe mental health problems had poorer physical and psychological well-being than comparison group parents (whose child was not affected by health problems or disabilities), parents whose child had mental retardation had a profile similar to the comparison group in physical health, depressive symptoms, and alcohol symptoms. They also had similar profiles of marital stability, signifying that stress in one domain (i.e., parenting) does not necessarily spill over into other spheres of life. In related research, parents of adults with mental retardation were found to be above the population mean in positive psychological well-being, life satisfaction, and health (Krauss and Seltzer, 1999).

How long-term caregiving for a child with mental retardation can be positive implicates the coping strategies of the parents facing this challenge (Seltzer, Greenberg, and Krauss, 1995; Essex, Seltzer, and Krauss, 1999) and the different aspects of the context, such as the availability of support (formal and informal) for dealing with the nonnormative challenge (Greenberg, Seltzer, Krauss, and Kim, 1997). We have found that aging mothers of adults with mental retardation are very effective at using problem-focused coping strategies to regulate their psychological distress

and well-being, a likely explanation for why nonnormative, chronically stressful demands tend not to result in compromised levels of psychological well-being. For example, aging mothers of adults with mental retardation who plan ahead and who are able to positively reinterpret stressful circumstances have lower levels of depressive symptoms even when they are faced with high demand for hands-on caregiving (Seltzer *et al.*, 1995). However, this positive effect of problem-focused coping strategies was not found when such strategies were used by aging mothers of adults with severe mental illness. This set of findings signifies that the resources that buffer the stresses of caregiving (e.g., problem-focused coping) are differentially effective, depending on the nature of the caregiving challenge (mental retardation versus mental illness, in this example).

Another buffer to the stresses of caring for an adult child with a disability such as mental retardation is social support (Greenberg *et al.*, 1997). As in the general population, aging mothers of adults with mental retardation tend to have lower levels of depressive symptoms if they have a large network of friends and family who provide them with support. In contrast, for aging mothers of adults with severe mental health problems, the size of the informal support network of friends and families was found to be immaterial to their psychological well-being. By way of explanation, the diagnosis of severe mental illness tends to be made in the son's or daughter's early adulthood, and thus the older mothers in the Greenberg *et al.* (1997) study had much less time to adapt to their caregiving challenge, the stigma of the disability, and to develop a network of supportive friends and family than their age peers whose adult child had mental retardation.

These studies suggest that midlife and aging mothers who experience nonnormative parenting such as having a child with mental retardation may succeed in maintaining healthy levels of psychological well-being by using selective coping strategies (such as planning ahead and positive reinterpretation and growth) and by having sustained relationships with friends and family members who can provide support to them. However, not all nonnormative challenges are alike, as having a son or daughter with mental illness poses stresses more difficult to overcome than parenting an adult child with mental retardation. This difference is largely because mothers of adults with mental retardation benefit from moderating and mediating processes such as using adaptive coping strategies and amassing social support, factors which tend to be less effective in maintaining the psychological well-being of aging mothers caring for adult children with mental illness.

Overall, parenting grown children with severe disabilities is an atypical version of family caregiving. It differs from caregiving for elderly relatives

in its duration (lasting five or six decades as contrasted with a period generally one-tenth as long), progression (marked by a gain rather than loss of skills and competencies in the care recipient over time), and outcome (the care recipient outlives the caregiver rather than the reverse). Yet it is similar to more conventional forms of caregiving in that caregivers can flourish in the context of high levels of stress depending on individual differences in intervening mechanisms (such as coping and social support).

For example, using structural equation modeling, Li, Seltzer, and Greenberg (1999) showed that daughters providing care to elderly parents were more effective in using problem-focused coping to maintain and improve their well-being over the course of their caregiving "career" if they had high initial levels of mastery. In another analysis from this study, social support was found to be more important to sustaining the psychological well-being of wife caregivers than daughter caregivers (Li, Seltzer, and Greenberg, 1997), underscoring the significance of the kinship relationship between caregiver and care recipient in conditioning the course of caregiving and its outcomes.

Thus, the effects of the increasingly common challenge of family caregiving are not uniform, and reflect individual differences in factors such as psychological and social resources, the type of disability for which care is provided, the life-course location of the caregiver, and the kinship relationship between the caregiver and the care recipient.

Relocation and caregiving Although life challenges are frequently studied individually, as illustrated by the above summaries, it is informative to contrast their effects on well-being as well as to examine whether intervening processes vary depending on the nature of the challenge encountered. Addressing such questions, Kling, Seltzer, and Ryff (1997) contrasted the experience of relocation, a typical and discrete later life event, with later life caregiving for an adult child with mental retardation, an atypical, long-term challenge. Data from the separate longitudinal studies described above were used to test the hypothesis that women experiencing community relocation (the more normative, expected, and short-term event), would report more positive cross-time change in psychological well-being than women with long-term caregiving responsibilities. In addition, relocation women were predicted to use more problem-focused coping strategies than caregiving mothers. Both predictions were supported. Women in the caregiving sample, however, showed stronger relationships between coping and well-being, underscoring possible gains in coping expertise that accompany challenges of lengthy duration.

Health challenges in later life

Later life, for many, brings increased incidence of health problems (chronic conditions, symptoms, functional impairment). That is, physical challenges of aging are quite common, typical, and even expected. For example, in the 60–69 age range, about 45 percent of women and 35 percent of men report two or more chronic conditions; these figures rise to 61 percent of women and 47 percent of men aged 70–79, and 70 percent of women and 53 percent of men aged 80–89 (Jaur and Stoddard, 1999). Do such changes undermine psychological well-being? What factors influence links between physical health and mental health as individuals grow old? These questions have been explored in several studies by Heidrich and Ryff (1993a, b; 1996; Heidrich, 1999). Social comparison processes were again emphasized as intervening mechanisms in the link between physical health and psychological well-being. A first finding was that older women who are in poor physical health engage more frequently in comparison with others, not just about their health, but also about their activity levels, physical appearance, and how they cope with aging. Moreover, such comparisons moderate the influence of their physical health on psychological well-being. That is, those in poor health who saw themselves comparing favorably with others had higher well-being (i.e., scores on personal growth, positive relations with others) and lower depressive symptoms than women in poor health who perceived more negative comparisons (Heidrich and Ryff, 1993a).

A further investigation (Heidrich and Ryff, 1993b) examined multiple aspects of the “self-system” as mediators of relationships between physical (chronic conditions, symptoms, functional limitations, subjective health) and mental health (depression, anxiety, life satisfaction, affect balance, well-being) in later life. In addition to social comparison processes, Heidrich and Ryff (1993b) assessed the extent to which older persons see themselves as having meaningful roles, reference groups, and normative guidelines. These ideas, drawn from Kuypers and Bengtson’s (1973) “social breakdown syndrome,” implicate the social feedback processes and socialization guidelines, or lack thereof, that contribute to negative self-perceptions in the elderly. Also examined was the degree to which the respondents’ ideals about themselves fell short of their actual self-perceptions – ideas drawn from Higgins’ (1987) self-discrepancy theory. Structural equation modeling provided empirical support for social comparisons and social integration (i.e., ratings of roles, reference groups, and normative guidelines) as mediators of the link between physical and mental health, but not for self-discrepancies.

Additional work on the latter, with a sample of young, middle-aged, and older adults, clarified that self-discrepancy varies with age (Heidrich,

1996). Ideal self-ratings converged with actual self-ratings for older adults, but were significantly different among young and middle-aged adults. Self-discrepancies were also found to mediate the effects of health problems on numerous indicators of psychological well-being and distress.

Summary

The preceding studies elaborate how normative and nonnormative experiences are linked with various aspects of psychological well-being in adulthood and later life. Well-being has also been examined as an *a priori* factor that influences how transitions are negotiated. Across all of these investigations, considerable emphasis has been given to mediating and moderating factors, such as social comparisons, reflected appraisals, attributions, coping strategies, and self-discrepancies. These have clarified the interpretive processes through which various life challenges are linked with a strong sense of purpose, mastery, growth, quality ties to others, and positive self-regard.

The above investigations have emphasized largely single life challenges—that is, they have tracked changes in well-being following a particular event (relocation) or an enduring experience (parenthood, caregiving, increased health problems). Such a *one-at-a-time* approach is not, however, consistent with how life is experienced for most individuals. That is, most people, at most periods in their lives, are dealing simultaneously with numerous life challenges. This fact was richly illustrated with members of the relocation sample, who over the course of the study reported, on average, that nine other events had co-occurred along with the move. Included were such experiences as death of significant others, health events, having someone move in or out of their home, changing jobs, and multiple events in the lives of children (marriage, parenthood, divorce, relocation, job change). In light of these observations, our next section examines cumulative profiles of experience and how they are linked with psychological well-being.

Putting normative and nonnormative experience together: cumulative profiles of challenge and psychological well-being

In this section, we will illustrate the integration of normative and nonnormative experience to create “whole lives” via two different studies, one cross-sectional, and the other longitudinal. In both the focus was on relating profiles of prior life challenge to psychological well-being. Ryff and Heidrich (1997) interviewed a sample of over 300 young, middle and old-aged adults, each of whom completed past life event inventories and

rated their psychological well-being. Normative experiences across these age groups were divided into three broad domains: educational and occupational events; family life events and friendships; and community and leisure involvements. Underscoring the age-graded nature of these experiences, respondents indicated how many of the events had occurred in their lives and how satisfying they found the experience to be. Nonnormative stresses were assessed with a modified version of the Life Experiences Survey (Sarason, Johnson, and Siegel, 1978), which measures the number and impact of a variety of unexpected life challenges (e.g., divorce, unemployment, financial problems) over a designated period of prior time.

The general prediction was that the completion of normative (expected, planned, positively sanctioned) events would contribute to perceptions of personal growth and development as well as a sense of mastery, purpose, and positive self-regard. Nonnormative experiences are typically construed as having adverse effects on health and well-being, although the literatures on resilience and growth through trauma (noted earlier) suggest that, under some circumstances, negative life stresses can ultimately have positive consequences. For both realms of experience, the objective was to quantify the accumulation of events through time and use them to predict variation in multiple dimensions of psychological well-being.

Regression analyses revealed that normative events were, in fact, significant predictors of well-being, but there were marked age differences in which domains of life were key influences. For young adults, it was participation in extracurricular and social activities that was strongly predictive of self-acceptance, mastery, and life purpose. For midlife adults, it was experiences in the relationship domain (family, friends) that strongly produced self-acceptance, mastery, and positive relations with others. For older adults, it was prior work and educational experiences that were strong predictors of personal growth, purpose in life, and environmental mastery. Nonnormative stresses had generally weaker linkages to psychological well-being, although for young adults, such adverse experiences were, as prior literature would suggest, significant positive predictors of personal growth.

The above investigation, while emphasizing the accumulation of normative and nonnormative events through time, analyzed these as separate realms of experience and did so with a largely nomothetic, group-differences approach. In a separate investigation (Singer, Ryff, Carr, and Magee, 1998) based on findings from the Wisconsin Longitudinal Study, we combined experiences across all these realms to create profiles of cumulative adversity and cumulative advantage over approximately 35 years (from senior year in high school to midlife). Life events and

conditions included in these profiles included extensive information about family background, adolescent aspirations and resources, education and training, job characteristics, marriage and parenting experiences, social participation, and acute events. The general prediction was that adversity and its accumulation over time would have negative mental health consequences, whereas advantage and its accumulation over time would have positive mental health consequences.

With regard to mental health outcomes, we cross-classified positive and negative aspects of mental health (i.e., psychological well-being, clinical depression) to identify various “types.” Of particular interest was the group described as “resilient,” which consisted of individuals who at some prior period in their lives had experienced major depression, but who in midlife reported high psychological well-being. Such individuals embody a *recovery* conception of resilience, in which they had gone through a difficult period, or periods, but subsequently, regained a strong sense of positive functioning. We used *person-centered* data analytic strategies to identify the primary life history pathways to such resilience among a sample of 168 resilient women. The analytic steps began with the writing of narratives for individual lives that summarized, in chronological order, the information evident in over 250 variables. Subsequent steps pared these variables down into frequently co-occurring conditions/events across particular subgroups and culminated in tests of distinguishability across subgroups (see Singer and Ryff, in press for a condensed summary of the analytic progression).

Four primary pathways to midlife resilience were identified. These differed in the timing and nature of the life adversities experienced as well as the timing and nature of offsetting advantage factors. A first pathway consisted of those with generally positive beginnings (e.g., high starting abilities, no alcoholism in childhood home) who subsequently experienced upward job mobility and related positive social comparisons. Despite these advantages, all of these women had experienced the death of one parent, most had had caregiving responsibilities for an ill person, and more than half had chronic health conditions. These were lives of chronic and acute adversities that were offset by positive work experiences, good beginnings, and favorable evaluations of self compared to others.

A second pathway consisted of women for whom the primary early adversity was growing up with an alcoholic parent. In addition, many of these women had experienced three or more acute events (i.e., death of parent, spouse, child; divorce; job loss). However, these women had important advantages involving social relationships and social participation as well as early employment with stable or upward occupational status.

These latter “plusses” may have contributed to their capacity to overcome notable early life difficulties combined with subsequent loss events.

A third pathway consisted of women who showed, primarily, advantage in early life: all had parents who were high school graduates, there were no alcohol problems in the childhood home, and the women had strong starting resources (high school grades, IQ). Later, however, they confronted various forms of adversity (e.g., poor social relationships, downward occupational mobility, job loss, divorce, single parenthood, caregiving). Their lives were thus characterized largely by adversity in adulthood, but they began their life journeys with important early strengths that likely facilitated recovery from the adverse experiences.

The final pathway consisted of women with more mixed profiles of advantage (e.g., intact families) and disadvantage (e.g., low parental education). As life unfolded, they confronted an array of adversities (e.g., single parenthood, downward mobility, living with alcohol problems in the home, acute events). As such, the resilience of the final pathway was more difficult to explain and underscored the need for additional information, pertaining perhaps to the women’s reactions to their life challenges as well as the quality of their significant social relationships.

Overall, these findings underscore the diverse ways in which life challenges can accumulate across time and be offset by countervailing accumulation of positive experience. A central message is that there are *multiple pathways through life challenges* to generally positive outcomes, but that this variation can nonetheless be organized into groups of whole lives. Person-centered methods are valuable for organizing such cross-time, cross-domain data, illustrating as they do, complex but discernable patterns, in how challenge accumulates in individuals’ lives and is successfully negotiated.

Linking life experience and well-being to health

Existing research connecting life experience to health is predominantly negative: life stresses and/or psychological disorders related to them are used to predict physical illness, disease, and death. Such inquiries do not advance understanding of what it means to thrive, flourish, and be well, sometimes in the face of adversity (Ickovics and Park, 1998; Ryff and Singer, 1998a, b). Construed positively, human health encompasses the above-described aspects of positive functioning, such as leading a meaningful, purposeful life and having quality ties to others. What is largely unknown, however, are the consequences of such well-being for biology. Full understanding of positive health thus requires mapping how positive psychological or relational experience is instantiated in neural

circuitry, and downstream endocrinological and immunological systems. The key question is whether these aspects of well-being, through various neurophysiological processes, culminate in physical health, vitality, and longevity.

In this section we will first briefly review concepts and empirical findings on the physiological signature of well-being. Second, focusing on one specific aspect of well-being – namely, good quality social relations with others – we will examine the extent to which cumulative relational experience is related to cumulative physiological burden (or its absence). Underscoring the theme of resilience, we will also describe an empirical investigation of whether the adverse consequences (physiologically-speaking) of cumulative economic disadvantage can be offset or protected against by enduring, high quality relationships with significant others.

The physiological signature of well-being

The most extensive work on physiological substrates of flourishing is found in animal models focused on positive affiliation (Carter, 1998; Panksepp, 1998). In particular, Carter (1998) provides a neuroendocrine perspective on attachment and love, noting that in animals attachment can be operationalized as selective social bonds, thereby facilitating observation and experimentation that connects such bonds to physiological substrates. A review of caregiver-infant and adult-heterosexual pair bonds reveals recurrent associations between levels of activity in the HPA (hypothalamic-pituitary-adrenal) axis and subsequent expression of social behaviors and attachments. Positive social behaviors (e.g., social bonds) appear to reduce HPA axis activity, whereas negative interactions sometimes have the opposite effect. Central neuropeptides, especially oxytocin and vasopressin, are implicated in social bonding and central control of the HPA axis. In prairie voles, for example, where there is clear evidence of pair bonds, oxytocin has been shown to increase social behavior, and both oxytocin and social interaction appear to reduce activity of the HPA axis. These processes, Carter suggests, may be relevant for understanding the health benefits that underlie loving relationships. In humans, positive patterns of interpersonal interaction have been found to predict lower levels of physiological arousal, particularly in the neuroendocrine and cardiovascular systems (Seeman and McEwen, 1996; Uchino, Cacioppo, and Kiecolt-Glaser, 1996).

Uvnas-Moberg (1997, 1998; Petersson, Alster, Lundeberg, and Uvnas-Moberg, 1996) further elaborates how oxytocin may mediate the benefits of positive social interaction and emotions. Oxytocin levels are raised by somatosensory stimulation (e.g., breast feeding or suckling) as

well as touch and warm temperatures. In both male and female rats, oxytocin exerts potent anti-stress effects, such as decreasing blood pressure, heart rate and cortisol levels, with effects lasting from one to several weeks. Rates of wound healing and weight gain are also promoted by oxytocin treatment. Extrapolating over the long term, salubrious social bonds can lead to repeated exposure to positive social stimuli, and thereby repeated release of oxytocin. More importantly, in humans such positive social experiences can be stored in memories, which may, in themselves reactivate these physiological processes.

Further avenues for linking positive human experience, particularly of the relational variety, to health, pertain to nerve growth factors and the anabolic growth promoting hormones that embody thriving (Epel, McEwen, and Ickovics, 1998) and help maintain and repair the body. A major task for future inquiry is to identify the naturally occurring interactions and activities (e.g., zestful group play in children; loving and supportive relationships in adulthood) that activate these growth-promoting processes.

Shifting attention to negative aspects of relational well-being, there is a substantial literature demonstrating associations between social ill-being and risk for morbidity and mortality. Using data from the Alameda County Study, a community-based prospective investigation, Berkman and Syme (1979) showed that those who lacked ties to others were nine years later two to three times more likely to have died than those who were socially connected. Subsequent inquiries have extended the documentation of health risks associated with social isolation, or lack of social support, to include risk of various diseases as well as reduced longevity (Berkman, 1995; Seeman, 1996; House, Landis, and Umberson, 1988).

The health effects of the social environment have been examined across the life-span. Taylor, Repetti, and Seeman (1997) explored the nature of “unhealthy environments” in childhood and pointed to three characteristics that undermine the health of children and adolescents: (a) a social climate that is conflictual and angry, or even violent and abusive; (b) parent-child relationships that are unresponsive and lacking in cohesiveness, warmth and emotional support; and (c) parenting style that is either overly controlling and dominating, or uninvolved with little imposition of rules and structure. Such characteristics were linked to depression and maladaptive ways of coping in children as well as health-threatening behaviors in adolescence.

With respect to older ages, studies have linked negative aspects of social interaction to increased cardiovascular and/or neuroendocrine activity (Seeman and McEwen, 1996; Uchino, Cacioppo, and Kiecolt-Glaser, 1996). Marital conflict has been linked to high blood pressure (Ewart,

Taylor *et al.*, 1991), elevated pituitary and adrenal hormones (Malarkey, Kiecolt-Glaser *et al.*, 1994), and physiological arousal (Levenson, Carstenson, and Gottman, 1994).

Three features of the human studies mentioned above deserve special attention. One is the general focus on individual biological parameters. Examination of single biomarkers neglects the possibility of co-occurring physiological risks, which may accumulate over time, and in turn, significantly impact health outcomes. The concept of allostatic load, introduced by McEwen and Stellar (1993), reflects this cumulative view of physiological risk, proposing that wear and tear across multiple physiological systems is a significant contributor to overall health risk. This wear and tear is hypothesized to ensue, at least in part, from repeated exposure to life challenges, such as social relational conflict and adversity. Further conceptual elaboration of allostatic load has been provided by McEwen (1998) and McEwen and Seeman (1999), and an initial operationalization of this concept has been put forth by Seeman *et al.*, (1997; 2000). Higher allostatic load – using measures of HPA axis, sympathetic nervous system, and cardiovascular activity, metabolism and adipose tissue deposition, glucose metabolism – has been shown in longitudinal studies to predict later life incident cardiovascular disease, decline in physical and cognitive functioning, and mortality. These diverse outcomes underscore the need for an early warning system of biomarkers that signal pending malfunction across a multiplicity of physiological systems. Allostatic load provides an initial candidate for such an early warning system.

A second significant feature of the extant social relationship/physiology literature is that most studies focus on single point-in-time assessments of relationships (e.g., in childhood, or adulthood, or later life). While useful, such queries do not provide insight into long-term profiles across multiple significant relationships. The potential health effects of cumulative relational adversity or advantage cannot be ascertained from such investigations. For example, some who experience conflictual relationships in adulthood, may have also experienced relational problems with parents in childhood. On the positive side, there may be continuity between nurturing and supportive relationships in childhood and emotional intimacy with a spouse or partner in adulthood. Thus, relational experience, positive or negative, may cumulate over time. Differences in the valence of such cumulative experience should have a physiological signature reflected in differing levels of allostatic load which, as indicated above, predicts a multiplicity of later-life health outcomes.

Finally, underscoring the theme of positive health, comparatively little prior research, especially in humans, has probed the links between “interpersonal flourishing” (i.e., loving, nurturing, enjoyable social

relationships) and intervening biological processes or health outcomes. That is, the science that connects the relational realm to neuroendocrine factors or immune function is heavily weighted on the side of documenting the adverse physiological sequelae of interpersonal conflict, or linking social isolation to morbidity and mortality. Missing from the literature are studies explicitly focused on relational strengths as possible contributors to positive health promotion (Ryff and Singer, 2000a). The physiological signature of well-being will also require incorporating additional neuroendocrine factors, such as oxytocin, which track the physiological substrates of interpersonal well-being.

Relationship pathways and allostatic load

The linkage of social well-being with biology is illustrated in a study in which we assessed cumulative relational experience and cumulative physiological burden (i.e., allostatic load) on the same respondents. The general prediction was that negative relational experience, in both childhood and adulthood, would contribute to increased allostatic load, while positive relational experience across time would mitigate against wear and tear on the organism. We explored this prediction with a biological sub-sample (N = 106) of participants from the Wisconsin Longitudinal Study (WLS), which is a large random sample of men and women who graduated from Wisconsin high schools in 1957 and were subsequently re-interviewed in 1975 and 1992/93. This biological subsample matched the income distribution of the full WLS population on family household income in 1957 and adult household income in 1992/93. In 1997, these respondents participated in a new wave of data collection that included, among other things, a detailed social relationship questionnaire, a physical health examination, and blood and urine samples. Laboratory assays and measurements taken during the physical examination were used to operationalize allostatic load.

The specific biomarkers included were: systolic and diastolic blood pressure (indices of cardiovascular activity); waist-hip ratio (an index of mesolism and adipose tissue deposition, thought to be influenced by increased glucocorticoid activity); serum HDL and total cholesterol (markers whose levels are known to influence the development of atherosclerosis – increased risk being associated with higher levels in the case of total cholesterol and lower levels in the case of HDL); blood plasma levels of glycosylated hemoglobin (an integrated measure of glucose metabolism over several days); serum dihydroepiandrosterone sulfate (DHEA-S; a functional HPA antagonist); 12-hour urinary cortisol excretion (an integrated measure of HPA axis activity); 12-hour urinary norepinephrine and epinephrine excretion levels (integrated indices of SNS activity).

For each of the ten biological parameters, subjects were classified into quartiles based on the distribution of scores in the MacArthur Study of Successful Aging (Seeman *et al.*, 1997), the data set that was initially used to calibrate risk zones for allostatic load. The allostatic load score for an individual was calculated by counting the number of parameters for which the person fell into the “highest” risk quartile (i.e., top quartile for all parameters except HDL cholesterol and DHEA-S for which membership in the lowest quartile corresponds to highest risk). Based on previous studies (Seeman *et al.*, 1997; 2000) persons with allostatic load scores of three or more are at elevated risk of incident cardiovascular disease, cognitive impairment, functional decline, and mortality. The same scoring procedures were used in the WLS biological subsample.

With regard to relational well-being, respondents were asked to report about their relationship with their mother and father (separately) when they were growing up. The items, derived from a parental bonding scale (Parker, Tupling, and Brown, 1979), probed the emotional, affective, and caring features of these relationships. In addition, multiple aspects of current connection to a spouse or significant other were assessed using four sub-scales from the PAIR (Personal Assessment of Intimacy Relationships) inventory (Schaefer and Olson, 1981). The emotional and sexual sub-scales were included because of their focus on the most intimate forms of connection between people. The intellectual and recreational sub-scales emphasize mutually enjoyed experience, companionship, and the scope of shared communication. A combined emotional/sexual scale (E + S) and a combined intellectual/recreational scale (I + R) were created as part of the specification of relationship pathways.

Putting together ratings of the parental ties and adult spousal connections, we defined an individual to be on the *negative pathway* if s/he experienced negative relationships with *both* parents and/or negative interaction with a spouse on both combined aspects of intimacy (E + S and I + R). We defined an individual to be on a *positive pathway* if s/he had a positive relationship with at least one parent and positive interaction with a spouse on at least one of E + S and I + R. Technical details about pathway construction are available elsewhere (Singer and Ryff, 1999). The positive pathway underscores the cumulative nature of positive emotional experiences with significant others in childhood and adulthood.

Both men and women on the negative pathway were significantly more likely to have higher allostatic load than their counterparts on the positive pathway. Stated negatively, persistent relational difficulty from childhood to adulthood was linked with greater wear and tear across multiple physiological systems. On the positive side, the findings suggested that having good quality social connections, with parents in childhood and spouse/significant other in adulthood, was associated with keeping

allostatic load low. This, in turn, implies substantially lower risk of negative downstream health consequences. The findings also portray allostatic load as a physiological signature of the cumulative social relational well-being or adversity.

The health import of cumulative life challenge can also be applied to economic well-being. At the level of income dynamics and its connection to health over the life-course, there is evidence showing that elevated permanent income, rather than contemporary cross-sectional income, has a strong protective effect on mortality (Deaton, 1999). The cumulative negative impact of persistent poverty on health has also received considerable attention (Korenman and Miller, 1997; Starfield *et al.*, 1991). Using 1957 household income of parents of WLS respondents (i.e. the economic environment when they were growing up) and their own household income in 1992/93 (i.e., their economic circumstances at age 52–53), we classified persons as being on one of four economic trajectories. These were labeled (–, –), (–, +), (+, –), and (+, +), where the first symbol (i.e., – or +) identifies negative (–) or positive (+) economic circumstances in childhood and the second symbol identifies negative (–) or positive (+) economic circumstances in adulthood. For persons on the persistently negative economic trajectory (–, –), 50 percent had high allostatic load, assessed in 1997. For persons on the persistently positive economic trajectory (+, +), only 36 percent had high allostatic load. The mixed trajectories had intermediate percentages at high allostatic load: 43 percent of those on (+, –) [i.e. downward mobility] had high allostatic load and 37 percent of those on (–, +) [i.e. upward mobility] had high allostatic load. Technical details about these economic categories are available in Singer and Ryff (1999).

Linking these economic trajectories with the relationship pathways, we found that cumulative positive relationships can have a protective, or compensating effect – reflected physiologically in allostatic load – against persistently negative economic circumstances. In particular, 69 percent of persons on the (–, –) economic trajectory who were also on the negative relationship pathway had high allostatic load at age 59. Alternatively, only 22 percent of persons on the (–, –) economic trajectory who are also on the positive relationship pathway had high allostatic load at the same age. Thus, cumulative relational well-being appeared as a possible basis for resistance to the physiological wear and tear of persistent negative economic circumstances. Further details about the interrelationships between cumulative economic, relational, and physiological pathways are available in Singer and Ryff (1999).

These findings are clearly preliminary, given the small sample size and retrospective features of the relational assessments. In addition, our emphasis on positive pathways needs to be linked with physiological markers

that capture, not only the absence of risk, but also the presence of protective factors, of which oxytocin may be a promising candidate. Nonetheless, we include the work as an example of scientific agendas that can incorporate diverse aspects of experiential histories and relate them to biology and health. The work also illustrates the ways in which psychosocial strengths can be studied as factors implicated in resistance to illness and disease (Ryff and Singer, 2000b).

Summary and conclusions

We have covered extensive territory in this chapter. Several realms of study, using both cross-sectional and longitudinal investigations, have documented links between psychological well-being, broadly defined, and normative and nonnormative life challenges. The point of these investigations is to show that life events and transitions both affect, and are affected by, individual differences in levels of positive self-regard, life purpose, sense of mastery, continued growth, autonomy, and quality of ties to others. Intervening mechanisms (e.g., social comparison processes, coping strategies, social support) were part of understanding who does well in such transitions and who does not. Augmenting the focus on single life challenges (e.g., parenthood, relocation, caregiving) was an emphasis on multiple co-occurring and cumulative life challenges. These latter studies combined assessments of normative and nonnormative life experiences, emphasizing the import of accumulation in both realms for well-being. The theme of resilience was invoked by targeting those individuals who are able to maintain high well-being in the face of challenges confronting them one at a time, or cumulatively.

Our final section sketched possible implications for health of cumulative life experience and persistent well-being (or ill-being). We reviewed emerging research on the physiological signature of well-being, giving particular emphasis to positive functioning in the social relational realm. Although considerable work has linked interpersonal conflict, strain, or loneliness to morbidity and mortality, as well as to intervening neuroendocrine and immunological processes, we called for greater emphasis on the positive side. Drawing on our recent work, we demonstrated connections between persistent relational strengths (the positive relationship pathway) and low physiological wear and tear (allostatic load). Resilience was again illustrated by showing that, in the face of cumulative economic adversity, good quality social relations appear to provide protection against high allostatic load.

Future research situated at the interface of unfolding life challenges, psychological well-being, and health is usefully organized via this pathway approach. Pathways are familiar territory to life-course developmentalists;

what may be novel, however, is the integration of age-graded (normative) and nonnormative experience on these pathways. Extending disciplinary boundaries beyond developmental psychology, the emphasis on positive psychological functioning in the face of cumulative challenge provides promising venues for understanding individual differences in health, vitality, and length of life.

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