The Model of Developmental Adaptation: Implications for Understanding Well-Being in Old-Old Age

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Abstract
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Disciplines
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The Model of Developmental Adaptation: Implications for Understanding Well-Being in Old-Old Age

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ABSTRACT

This chapter introduces the model of developmental adaptation, an extension of the adaptation model used in the Georgia Centenarian Study. The focus of this model is to combine distal experiences and past achievements as important predictors of well-being and adaptation in later life. Modeling results suggest that distal events have a direct effect on adaptation, proximal events have a direct effect on adaptation, and that the effect of distal variables on adaptation is mediated by proximal resources. Illustrations of the developmental adaptation model will be given. For example, results suggest that education and life-time negative events (as distal variables) predict mental health with competence (a proximal resource) as a mediator. The implications for understanding well-being in old-old age will be discussed.

INTRODUCTION

Very old individuals face a number of uniquely demanding life challenges. For those persons entering the 9th, 10th, and 11th decades of life, negotiating increasingly restrictive functional limitations and rapidly shrinking social-support networks becomes a dominant life concern and activity (Martin, Poon, Kim, & Johnson, 1996). How do older adults adapt to these changes? The purpose of this chapter is to introduce a model of developmental adaptation that incorporates distal and proximal influences in the prediction of longevity and adaptation in later life. In the first section of this chapter, we review a number of common adaptation models. This section is followed by an overview of studies based on the Georgia adaptation model. We then discuss the model of developmental adaptation and show illustrative examples for this model.
MODELS OF ADAPTATION IN ADULT LIFE

The study of adult development and the adaptability to change has received considerable attention in the past few decades (Frisanco, 2009; Martin & Martin, 2002; Schlossberg, 1981). Some of the early research in adult development highlights the critical aspects of life transitions such as chronological age (Levinson, Darrow, Klein, Levinson, & McKee, 1978), individual variability (Neugarten, 1979), changing relationships (Hartup & Stevens, 1999; Vaillant, 1977), and adaptation to life events (Lowenthal, Thurnher, & Chiriboga, 1975; Martin & Martin, 2002; Ong & Bergeman, 2004). Schlossberg (1981) described adaptation as the balance of individual resources and deficits as well as differences in transition environments in her model of successful adaptation. Her model also highlighted characteristics of the particular transition (role change, affect, timing, onset, and duration), environmental characteristics (internal support systems, family, friends, and institutional support) and characteristics of the individual (age, gender, ethnicity, health status, socioeconomic status, and value orientation) as the key determinants of successful adaptation.

Complementing some of the earlier models of aging and adaptation is the life-course framework, which underscores a variable sequence of development and the pivotal role of life events in individual development throughout the life span. Successful aging is often referred to as a guiding theme for optimal adaptation to social, psychological, and physical changes and overall well-being in later life (Rowe & Kahn, 1997). The selective optimization and compensation model (Baltes & Baltes, 1990) explains the process of successful aging through effectively selecting areas of functioning, optimizing those areas as best as possible, and compensating for losses as people age. A link between gender role changes in later life, and successful adaptation has also been reported (Shimokawa, Nakazato, Kawaai, & Sato, 1997). Steverink, Lindenberg, and Ormel (1998) suggested a hierarchical and patterned change in resources and goals as a determinant of successful adaptation. Ong and Bergeman (2004) have argued that emotional resilience and adaptability to stressful life events were the key determinants of well-being in later life. This might be especially relevant for the oldest old, who witness a range of life stressors such as loss of spouse, loss of children or siblings, diminished social contact, and physical and cognitive impairments. Although a range of disciplines have attempted to study human adaptation as we age (Frisanco, 2009), there is consensus that it is not the process of change per se but adaptability to change that makes the process of aging successful and helps us attain an optimal state of well-being.


THE GEORGIA ADAPTATION MODEL

The Georgia Adaptation Model (GAM; see Figure 5.1; Poon et al., 1992; Poon, Johnson, & Martin, 1997) was specifically developed to assess adaptational characteristics of long-lived individuals. The model is based on Lehr’s (1982) longevity model and features seven clusters of interrelated variables that constitute a network of adaptational predictors and outcomes integral to physical and psychological well-being in extreme old age. The GAM contains the following elements: family longevity (i.e., how long family members lived), environmental support, individual characteristics, behavioral skills, nutrition, mental and physical health, and life satisfaction. Some of the model elements (e.g., biomedial), may be more important for survival in oldest-old populations, whereas other elements (psychosocial factors) may be more important among the younger-old populations (Hagberg, 2006).

The GAM is a heuristic model that has been applied in a number of our publications. For example, Martin et al. (1992) tested the relationship among personality, events, coping, and mental health and reported that anxiety was the strongest predictor of low morale and mental health, whereas extraversion and life stress were positively related to active coping. In using the GAM as a conceptual framework to predict loneliness, Martin, Hagberg, and Poon (1997) reported that low social support and low cognitive functioning were salient predictors of loneliness. Martin, Rott, Kerns, Poon, and Johnson (2000) tested several predictive models of depression and reported that the
personality trait tension and hearing impairment were significant predictors of depression, but those direct associations were mediated by the way in which health was appraised to limit activities. Moderating effects were also found. For example, only under the condition of health being perceived as standing in the way of activities did low levels of social relations significantly predict depressive symptoms. Bishop, Martin, MacDonald, and Poon (2010) recently tested a model of life satisfaction for a centenarian sample. Not surprisingly, their results suggested that past satisfaction with life emerged a key predictor of happiness. However, past life satisfaction also predicted perceived economic security and subjective health, and perceived economic security had a strong influence on subjective health status.

The GAM has been extensively used as a heuristic framework in research related to health-care practices and functional health in later life (Feas, Martin, & Poon, 1999; Poon, Martin, Clayton, Messner, Noble, & Johnson, 1992). A range of literature confirms the critical role of psychosocial adaptation among very old adults as an important predictor of outcomes such as physical health and disability (Jang, Poon, & Martin, 2004; Lupien & Wan, 2004), functional status (Gondo et al., 2006), mental health (Jang et al., 2004; Fry & DeBats, 2002), and autonomy (Ozaki, Uchiyama, Tagaya, Ohida, & Ogihara, 2007).

DEVELOPMENTAL ADAPTATION MODEL

Although the Georgia Adaptation Model has served as a useful framework for the study of longevity and adaptation in late life, at least one important component is missing from the model: the inclusion of distal experiences. An extension of the model was therefore introduced in our most current work (Martin & Martin, 2002), which resulted in the proposal of the Developmental Adaptation Model (Figure 5.2).

The general assumption in the Developmental Adaptation Model is that personal resources and experiential factors optimize adaptation over the life span (Fry & DeBats, 2006). The model integrates distal influences, resources, behavioral variables, and developmental outcomes. As intervening variables, individual, social and economic resources, proximal life events, and behavioral “coping” skills represent the contribution of adaptional processes to positive developmental adaptation outcomes. The exogenous variables (distal life events and past personal achievements) signify the influence(s) of distal experiences and events. The developmental outcomes (functional capacity and subjective health, cognitive impairment, mental health, economic cost and burden, psychological well-being, and longevity) reflect

![Figure 5.2. The Developmental Adaptation Model. Reprinted from Martin and Martin (2002), with permission from Elsevier.](image)

fundamental quality-of-life characteristics. Recent empirical evidence underlines the importance of distal influences: childhood economic status, lifetime trauma, and children’s personality traits continue to have long-lasting influences on physical functioning and health behaviors in middle and later life (Guralnik, Butterworth, Wadsworth, & Kuh, 2006; Hampson, Goldberg, Vogt, & Dubanosk, 2006; Krause, Shaw, & Cairney, 2004). Shmotkin (Chapter 3) and Hyer (Chapter 8) also provide ample evidence that early traumatic experiences continue to exert influences on late-life adaptation. As Shmotkin points out, “trauma is a ‘distal’ (past) factor whose influence on developmental outcomes may be direct or indirect, depending on its interaction with ‘proximal’ (present or recent) resources and coping behaviors.”

Our recent studies have demonstrated that distal variables play an important role in adaptation. Hensley, Martin, MacDonald, and Poon (2010) reported that the number of children significantly predicted the ability to engage in activities of daily living and loneliness after controlling for other distal influences (e.g., childhood health, financial situation early in life). Older adults who had more children had higher scores in activities of daily living and lower scores in loneliness. In addition, childhood health significantly predicted loneliness. Poor health in childhood was associated with higher loneliness scores. The cognitive evaluation of distal experiences therefore is important for optimal adaptation and coping (Simsek, 2009).
Engaged lifestyle (e.g., volunteering, traveling, giving public speeches) also turned out to be an important predictor of current adaptation (Martin, Baenziger, MacDonald, Siegler, & Poon, 2009). Results suggested that centenarians, who had volunteered, traveled, and had given public talks and balanced their checkbooks at any time of their life were more likely to show relatively high mental status scores.

In spite of the evidence supporting the importance of distal variables, a shortcoming of adaptation models is the omission of specific change variables explaining adaptational outcomes. For example, changes in resources, rather than resources by themselves, may be responsible for rapid decline in functioning among very old adults. Initial levels of resources may also explain differential decline in adaptational outcomes. Randall (2006), for example, evaluated the relationship between resources and activities of daily living for the Georgia centenarian sample and found that centenarians with initially higher social resources showed a steeper decline in activities of daily living than centenarians with lower social resources, which suggests that high social supports do not slow down changes in activities of daily living for extremely old individuals. Other research has demonstrated that change in self-rated health is a stronger predictor of mortality than initial or later levels of self-rated health (Han et al., 2005).

In the recent literature, the developmental adaptation model has been used to study a range of proximal and distal influences, such as educational attainment (Bishop & Martin, 2007), losses related to residential status and community (Cook, Martin, Yarns, & Damhorst, 2007) and its effects on health and well-being in later life (Fry & DeBats, 2006; Simsek, 2009). In addition, the model has been applied to emphasize the influence of proximal and distal events to other population groups and broader issues such as marital interactions in midlife (Schmitt, Kliegel, & Shaprio, 2007), individuals with learning disabilities (Margalit, 2003), substance abuse among adults (Schulenberg & Maggs, 2008), and parenting behaviors of adolescents’ mothers (Meyers & Battistoni, 2003). The model has also been applied by Martin et al. (Chapter 7) to assess the influence of proximal and distal events on well-being; by Hyer and Yeager (Chapter 8) to address the importance of posttraumatic stress disorder and by MacDonald and Cho (Chapter 9) to assess the interplay between distal events, proximal resources, and well-being. Bishop (Chapter 13) evaluates the important model component of religious coping for well-being in late life.

Another extension of adaptation models includes the test of model equivalence across different cultural groups. Fry and Ikels (Chapter 15) underline the importance of assessing cultural differences in well-being and differences in the measurement of well-being. The domains health and body status, material security, social issues, and personhood mentioned in their chapter are consistent with our models that include individual and social resources and developmental outcome measures. These domains may manifest themselves differently in different cultures.

To what extent do the model relationships fit oldest old survivors in the United States and in European or Asian survivors? Distal experiences may be more important among cultures with more direct involvement in wars or economic depressions. Environmental support (e.g., family support) may be more important in cultures in which intergenerational family residence is the social norm. Personality traits may have different effects in cultures emphasizing self-esteem and openness to experience. Finally, functional, physical, and mental health may be culturally determined as well. An assessment of cultural invariance can easily be accomplished by conducting multiple group analyses that would allow for the systematic equivalence test of measurement models, structural models, and error variance.

One caveat in the comparison of studies across cultures is that not all studies draw from the same resource and adaptation measures. However, in those cases, parallel analyses can still be conducted. One example is the comparison of the Georgia Centenarian Study data with data from the Swedish Centenarian Study. Martin et al. (1997) demonstrated that comparative studies are meaningful even if they are based on different measures, and they reported substantial differences for the prediction of loneliness among centenarians.

ILLUSTRATIVE EXAMPLE

Potential pathways for the effect of distal and proximal variables are illustrated in Figures 5.3 and 5.4. Data for this analysis come from centenarian self reports of the Georgia Centenarian Study (Poon et al., 2007). Centenarians reported on a number of life events that had occurred during any time of their lives. We assessed overall distal events (those experiences that happened at least 20 years before our interviews) to evaluate the cumulative effect of events. Furthermore, we assessed very specific individual events and their impact on adaptation in very late life. In the first example, we included the age when centenarians had experienced the death of their parents. Experiencing the death of a parent early in life can increase resources (e.g., personality or economic resources), because individuals have to rely on their own skills. Losing a parent late in life, in turn, signifies a longer shared life. As an important distal achievement variable we included level of education.
and extraversion in turn was significantly related to depressive symptoms. Mother’s age at death did not influence centenarians’ personality, but it did have a negative effect on perceived economic status in late life. Centenarians who reported to have lost their mothers in early life were less likely to view their economic status as high. A third significant pathway indicated how influential education was in predicting perceived economic status. Perceived economic status, in turn, influenced positive views of coping. Proximal events were only marginally associated with depressive symptoms.

The second example (Figure 5.4) highlights the relationship between cumulative negative life events and education (as distal influences) in relation to resources (competence, proximal events, perceived economic status), and developmental outcomes (positive coping and depression). Lifetime (cumulative) negative events eroded the personality trait competence, which was significantly related to positive coping and lower levels of depression. Lifetime negative events were also associated with proximal events and diminished levels of perceived economic status. Higher economic status, in turn, was positively associated with positive coping.

Taken together, the models in Figures 5.3 and 5.4 exemplify that specific early events (e.g., losing a parent) and lifetime cumulative events are associated with individual and economic resources, which in turn are related to mental health and adaptation outcomes. Education is another important distal influence, particularly in determining economic resources in late life. These examples suggest that distal experiences and proximal resources are important correlates of adaptation in very late life.

CONCLUSIONS

The models introduced have a number of important implications for studying the well-being of old and very old adults. Conceptual models force researchers and practitioners to think beyond single causes by focusing on a distinct network of variables responsible for adaptational outcomes. Multivariate models also allow for the test of mediating (indirect) and moderating (difference) effects. By including distal experiences in conceptual models, building blocks of later-life reminiscence and congruence between aspirations and achievements are posited (Bishop, Martin, & Poon, 2006). Social and economic resources provide older adults with support and help that is necessary when physical, functional, and mental health decline. Individual characteristics, such as personality and religiosity, help provide a sense of stability when challenges abound. Individual and socioeconomic resources may also explain why some older adults continue to do well and others
do not. Shirra and Shmotkin (Chapter 6) report that, even after major trauma (e.g., having experienced the Holocaust) and under accelerating decline associated with old-old age, past experiences can continue to exert positive effects on well-being, but past distress also maintains its predictive power on well-being. Perhaps past pleasant or past disturbing experiences can be maintained or exacerbated when resources remain strong (i.e., positive influences) or weaken considerably (i.e., negative influences). The connection among these lifelong influences on well-being, mediated through resources, is the primary proposition of the developmental adaptation model.

Behavioral skills and nutritional health behaviors allow older adults to maintain a sense of control even under difficult late-life circumstances. Finally, the maintenance and optimization of mental health, physical health, and life satisfaction are core components in the quality of life among old and very old adults. Well-being in very late life is multifaceted and multidimensional. Cohen-Mansfield’s contribution in this book (see Chapter 4) points out that there is a lot to be learned from older adults who adapt to regular changes in their lives. Often seen as a static outcome variable, well-being may indeed be the baseline from which older adults shift when resources are scarce or stress is too overpowering. Because well-being contains many dimensions, older adults are able to rely on some resilience dimensions while experiencing the decline of others.

The Georgia Adaptation Model and the Developmental Adaptation Model may prove fruitful for purposes of intervention. As Hyer (Chapter 8) noted, several therapeutic interventions with older adults suffering from posttraumatic stress disorder promise to be effective: anxiety management training, cognitive behavioral approaches, exposure therapy, and reminiscence with positive and negative self-focus. These interventions attempt to alter some of the perceptions or direct components of developmental adaptation, and Hyer proposes to take a stepwise approach to therapy with patients of posttraumatic stress disorder. The first task focuses on the symptoms, perhaps best represented by the adaptational outcome variables in our models. Another step focuses on developmental factors, which for the most part are congruent with our notion of individual and social resources. The next steps described by Hyer deal directly with the distal traumatic event recalled by an older adult.

Conceptual models are often thought of as hypothesis-testing models, and sophisticated structural equation modeling programs allow us to evaluate the fit of a model to available data. Conceptual models, however, can also be helpful in identifying possible avenues of intervention and treatment that may ultimately increase the well-being of individuals who experience developmental changes and transitions. In that regard, theoretical models should be considered more or less useful in explaining phenomena and guiding therapeutic interventions.

REFERENCES


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**PART II**

**PARADISE LOST: BETWEEN TRAUMA AND HAPPINESS**