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Adaptive midlife defense mechanisms and late-life health

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Abstract

A growing body of research suggests that personality characteristics relate to physical health; however, this relationship has primarily been tested in cross-sectional studies that have not followed the participants into old age. The present study utilizes data from a 70-year longitudinal study to prospectively examine the relationship between the adaptive defense mechanisms in midlife and objectively assessed physical health in late life. In addition to examining the direct effect, we test whether social support mediates this relationship. The sample consisted of 90 men who were followed for over seven decades beginning in late adolescence. Health ratings from medical records were made at three time points (ages 70, 75, and 80). Defense mechanisms were coded from narratives by trained independent raters (Vaillant, Bond, & Vaillant, 1986). Independent raters assessed social supports between ages 50 and 70. More adaptive defenses in midlife were associated with better physical health at all three time points in late life. These relationships were partially mediated by social support. Findings are consistent with the theory that defense maturity is important for building social relationships, which in turn contribute to better late-life physical health. Psychological interventions aimed at improving these domains may be beneficial for physical health.

Keywords

Personality; Defense mechanisms; Defense maturity; Coping; Social support; Physical health

1. Introduction

Defense mechanisms refer to largely unconscious or automatic efforts to maintain psychological stability in the face of internal and external stressors through the modification of how reality is perceived (Cramer, 1998, 2000; Vaillant, 1971, 1994). Some defenses are thought to be adaptive whereas others may be more problematic, leading to difficulties in one's emotional life and environment. For example, more adaptive defenses are linked to better relationships, work satisfaction, mental health, and subjective well-being, whereas less adaptive defenses are linked to poorer mental health, work problems, and difficulty in relationships (Larsen et al., 2010; Vaillant, 1976, 1977, 1978; Vaillant & Mukamal, 2001). A small body of literature suggests that defense mechanisms may also have important consequences for an individual's physical health (Flannery & Perry, 1990; Olff, Brosschot, & Godaert, 1993; Soldz & Vaillant, 1998; Vaillant, 1993). However, the ways that defenses affect physical well-being are incompletely understood (Olff, 1999). Research suggests that

social support may be an important factor, as it has been linked empirically with both physical health (Uchino, Cacioppo, & Kielcot-Glaser, 1996) and personality functioning (Vaillant, 2000).

In the present study we seek to clarify this relationship through examining how midlife defense mechanisms may predict better health in late life via the presence of greater social support. The data are drawn from a longitudinal study of adult development spanning over seven decades (Vaillant, 2000). This research has implications for understanding targets of psychosocial intervention that influence physical well-being in older adults. The current pandemic of chronic preventable disease among middle-aged and older adults lends particular urgency to the search for potentially modifiable factors that are linked with physical health (National Center for Health Statistics, 2011).

To date there is little research on how more adaptive defense mechanisms relate to health in older adults. Old age presents unique challenges, as individuals approaching the end of life experience increased health problems and face a variety of changes in their social support networks (Vaillant & Mukamal, 2001). In this study we hypothesized that midlife adaptive defenses may enable individuals to form strong relationships that set the stage for healthier aging in the seventh and eighth decades of life.

1.1. Mechanisms of defense

The concept of defenses originated from the psychoanalytic tradition referring to both adaptive and maladaptive mechanisms for coping with experiences that challenge one's emotional equilibrium (Freud, 1894, 1926, 1936). These habitual styles of emotion-focused coping often operate automatically outside of the person's awareness (Lazarus & Folkman, 1984; Vaillant, 2000). Defenses are typically classified hierarchically by levels of maturity. Mature defenses (e.g., sublimation, suppression, anticipation, altruism, humor) are prominent in those with greater levels of success in work and relationships and lower levels of psychopathology; intermediate or neurotic defenses (e.g., displacement, repression, reaction formation) are less adaptive but are found across all levels of life functioning; whereas immature defenses (e.g., projection, passive aggression, acting out, denial) are associated with difficulty regulating, expressing, and understanding emotional experiences (American Psychiatric Association, 2000; Segal, Coolidge, & Mizuno, 2007; Vaillant, 2000; Vaillant, Bond, & Vaillant, 1986).¹

Mature defenses allow better modulation of distress while maintaining engagement with reality. For example, when coping with illness, a person may recognize that she is distressed but adaptively manage the feelings through pursuing an artistic endeavor (i.e., sublimation) or being purposefully circumscribed when thinking about effects of the illness (e.g., at doctors appointments, when receiving care from a loved one, while engaging in health-maintenance behaviors) therefore relying on suppression. Mature coping mechanisms such as humor and altruism (e.g., volunteering in an organization for people who are also struggling) diminish the emotional impact of distress, also while keeping those individuals better engaged with reality. In contrast, another person may use the less mature defense of denial, blocking out any feelings of distress and actively working to avoid thinking or talking about the illness (e.g., skipping appointments, not acknowledging the extent of the severity or health implications of the condition, refusing care from loved ones) leading to unexpressed emotional distress as well as poor self-care.

¹Readers interested in descriptions of individual defense mechanisms are referred to Vaillant (1971), Vaillant (1994), Vaillant (2000). It is notable that Vaillant (2000) differentiates adaptive suppression from the cognitive (and empirically ineffective) strategy of "thought suppression." Suppression in an adaptive form continues to allow conflict to exist in one's awareness and is not a complete rejection of a distressing thought.

1.2. Personality and health outcomes

Although there are relatively few studies of defense mechanisms and physical health, important cross-sectional links have been identified (Eriksen, Olff, & Ursin, 1997; Flannery & Perry, 1990; Olff et al., 1993). For example, Albuquerque et al. (2011) found that patients with chronic obstructive pulmonary disorder were more likely than healthy controls to have immature and neurotic defenses, and that immaturity of defenses related to lower health-related quality of life and greater perceived severity of symptoms. In a longitudinal study of midlife defenses and physical health in men from lower socioeconomic strata, Vaillant (2000) found that maturity of defenses in midlife (prior to age 47) predicted lower self-reported level of physical disability at age 65. This relation held when restricting analyses to men who were healthy by objective report at age 50.

Previous research with the current longitudinal sample found that men who relied on immature defenses as young adults (age 20–47) manifested increasing prevalence of objectively-assessed chronic, irreversible health problems from age 30 to 60 (assessed at 5 year intervals), when compared to those utilizing more adaptive defenses (Vaillant, 1993). However, this relationship between early adult defense maturity and health was no longer present after age 65. More specifically, more adaptive defenses prior to age 47 predicted subjective physical functioning at age 65, but not objective physical health (Vaillant & Vaillant, 1990).

The present work extends the examination of this longitudinal cohort by focusing on defenses assessed in midlife (age 47–63) in relation to late-life health as assessed from medical records. Unlike early-adult defenses, which were unrelated to late-life health (Vaillant, 1993), we hypothesized that defenses utilized in greater temporal proximity to late life (i.e., midlife) would be associated with objective late-life health outcomes. Since defenses are not static phenomena but may change as individuals age based on experiences and relationships (Vaillant, 1977), a lifespan perspective on personality development may be helpful in understanding the relationship of more adaptive defenses to health.

1.3. Social support as a mediator

Smith and Spiro (2002) posit that personality leads individuals to choose social contexts that are either health-promoting or health-reducing. Using this developmental lifespan approach, we hypothesized that social support would mediate links between personality and late-life physical health. According to this model, adaptive defense mechanisms lead to enhanced social supports, which ultimately lead to better physical health outcomes in older adulthood.

In samples of older adults, certain personality characteristics are associated with use of social support. Cukrowicz, Franzese, Thorp, Cheavens, and Lynch (2008) suggest that among depressed older adults both extraversion and conscientiousness may protect individuals from withdrawing from relationships. These traits may correspond to defenses that enable individuals to connect to their environments as they face stressors associated with aging. In our own longitudinal study, for example, adaptive mechanisms of defense measured in young adulthood (age 20–47) are positively correlated with greater social support at age 70 ($r = .34, p < .001$; Vaillant, 2000).

Results of numerous studies consistently indicate that social support influences physical health outcomes (Berkman, Glass, Brissette, & Seeman, 2000; Uchino, 2009). Individuals with greater social support have lower rates of mortality from cardiovascular disease, cancer, and infectious disease (Brummett et al., 2001; Lee & Rotheram-Borus, 2001; Rutledge et al., 2004; Uchino, 2009). Perceived social support is associated with lower mortality rates, even when statistically controlling for baseline demographic factors and physical health status (e.g., Brummett et al., 2001).

The current study uses a composite measure of social support that considers closeness of family relationships, religious involvements, number of close confidantes, number of friends, and participation in other social activities. Using a similar approach, Golden, Conroy, and Lawlor (2009) found that social involvement was associated with lower levels of mental illness, cognitive impairment, and physical disability in adults over age 65. Our study is unique in that it prospectively examines social involvement and its effect on health at three different points in later life.

1.4. Aims of the present research

Building on past research, the current study examined whether adaptiveness of defenses in midlife is linked with physical health in late life, and if so, whether social support mediates this link. We hypothesized that adaptive mechanisms of defense would directly relate to greater social support between age 50 and 70 and better physical health at ages 70, 75, and 80, and that social support would at least partially explain the relationship between personality and health outcomes. We examined health outcomes at ages 70, 75, and 80 to investigate whether the hypothesized relations would be consistent across time or whether the natural decline of health that occurs with age would diminish the relevance of psychosocial variables.

2. Material and methods

2.1. Participants

Participants were 90 men drawn from a larger sample of 268 Caucasian male Harvard College sophomores (born between 1915 and 1924) in a study of male psychological health (Heath, 1945; Vaillant, 2000). Selection criteria for the initial study included absence of both physical and mental illness and satisfactory freshman academic record (Heath, 1945). Participants' IQs ranged from 110 to 150 ($M = 136.20$, $SD = 11.71$). The men were primarily of middle and upper socioeconomic status. On entry into the study, the men were assessed by internists, psychiatrists, psychologists, and anthropologists. Over the next 60 years, men completed questionnaires approximately every 2 years, their medical records were obtained every 5 years, and they were interviewed every 10–15 years. The subset of 90 participants was selected based on the availability of midlife defense data. Using *t*-tests we determined that these 90 individuals did not differ significantly from the other participants in this cohort in terms of level of education, social class, smoking history, alcohol use, obesity, defense maturity in young adulthood (age 20–35), social support in midlife (age 50–70), and late-life health (ages 70, 75, and 80).

2.2. Measures

2.2.1. Physical health – age 70, 75, 80—Physical health was rated every 5 years by an internist blind to other study data who based the ratings on data from physical examination, blood chemistries, electrocardiogram, chest X-ray, and medical records obtained from primary care physicians and hospitalizations. Ratings were: 1 = excellent physical health; 2 = minor irreversible problems; 3 = chronic illness without disability; 4 = chronic illness with disability and/or restricted activity; 5 = limited mobility but full self care; 6 = confined to bed, nursing home, needs help with self-care; 7 = deceased. Previous research from our study utilizing this scale to assess objective health at age 70 found moderate positive correlations with concurrent subjective health ratings ($r = .44$, $p < .05$) and objective health assessed at age 45 ($r = .33$, $p < .05$) (Koenig & Vaillant, 2009).

2.2.2. Adaptive mechanisms of defense—Defense maturity was by two independent raters from vignettes taken from interview transcripts and qualitative written responses to biennial questionnaires administered when the men were between the ages of 47 and 63. We

have previously described this process in great detail in other studies (Vaillant, 1971, 1977, 1994; Vaillant et al., 1986); however, we summarize briefly below. Using these vignettes that described participants' coping in times of stress, raters coded the extent to which individuals relied on mature defenses (sublimation, suppression, anticipation, altruism, humor); intermediate/neurotic defenses (displacement, repression, reaction formation); or immature defenses (projection, passive aggression, acting out, denial). To control for variation in number of vignettes across subjects, raters utilized a quantitative strategy to force clinical judgment of the global maturity (health) of defenses into a nine-point scale.

To calculate defense maturity, raters distributed 8 points across the three domains of defense maturity (mature, intermediate/neurotic, or immature) with each domain ranging from 1 to 5, resulting in ratios of the three defense maturity categories (e.g., 5:2:1 would indicate to someone who primarily used mature defenses [5] and infrequently used immature defenses [1]). The score for overall defensive style for each subject was then estimated by subtracting the rating for mature defenses from the rating for immature defenses resulting in a 9-point range (−4 to 4). Ratios of adaptive to less adaptive defenses were then converted to a 1–9 scale (1 = very maladaptive/immature; 9 = very adaptive/mature) to provide an overall estimate of maturity of defenses. The interrater reliability using Pearson's r using this method in our sample ranged from .72–.84. Validity of these ratings is supported by previous associations between adaptiveness of defenses and income, marital satisfaction, and psychosocial adjustment, all at the $p < .001$ level of statistical significance (Vaillant, 2000).

2.2.3. Social support age 50–70—Independent raters assessed participants' engagement with social supports between ages 50 and 70 using a 16-point composite scale (see Vaillant and colleagues, 1998). The raters used data collected from the 11 biennial questionnaires completed by participants during these two decades. The scale was comprised of subscales for relationship with spouse (0–4); relationship with siblings (0–2); relationship with offspring (0–2); religious involvement (0–2); presence of confiding relationships (0–2); engagement in social recreation with non-family members (0–2); and quantity of close friends (0–2). Scores ranged from 2.0 to 13.5. Reliability for these ratings was strong with intraclass correlations averaging .92 for three raters across a subset of 30 cases. Previous studies have found that this measure of social support is significantly correlated in the expected directions with poor physical health at age 50, alcohol abuse, smoking, and indicators of depression, all at the $p < .001$ level of statistical significance (Vaillant, Meyer, Mukamal, & Soldz, 1998).

2.3. Data analysis

Correlations among defense maturity, social support, and late-life health were first examined. In light of these correlations and previous research, we examined the extent to which social support mediates the relationship between defense maturity and late-life health at ages 70, 75, and 80. Mediation was tested using linear regression and following Baron and Kenny's (1986) recommendations for mediation analysis.

3. Results

Means and standard deviations for traits and difference scores are presented in Table 1. We examined bivariate correlations between defense maturity, social support, and physical health outcomes at ages 70, 75, and 80 (Table 1). More adaptive defenses were associated with positive health outcomes at all three time points and with social support. Social support was also positively associated with better health at all three time points. The data therefore met the prerequisites of mediation (Baron & Kenny, 1986). In light of the correlations reported above, we next examined the extent to which social support mediates the relations

between adaptive defenses and late-life physical health at all three time points (age 70, 75 and 80).

To assess social support as a mediator of adaptive defenses, we first conducted regressions with health outcomes as the criterion variable and adaptiveness of defense as the predictor variable (See Table 2). As shown in Table 2, once social support was included in the model, the effect of defense maturity on late-life health at ages 70 and 75 was reduced to non-significance, and the link between social support and health was significant, indicating mediation. At age 80, the results followed this same pattern except that the relation between social support and age 80 health was reduced to a statistical trend. The Sobel (1988) z test was significant at all three time points (age 70, $z = 3.12$, $p < .001$; age 75, $z = 3.13$, $p < .001$; age 80, $z = 2.66$; $p < .01$), indicating significant mediation. Overall, the results from the models suggested that a significant portion of the variance in late-life health at ages 70 and 75 (delta R-square = 12% at age 70; 9% at age 75; 7% at age 80) could be attributed to the contributions of adaptive defenses and social support. Thus, the data provide evidence for both a direct effect of adaptive defenses on late-life health and an effect partially mediated by social support.

4. Discussion

Our findings revealed that more adaptive mechanisms of defense in midlife consistently predicted better late-life health outcomes. This positive association was present across all three waves of health outcome data, indicating the persistence of this finding well into old age, suggesting that adaptive patterns of coping may help preserve late-life health. While building on previous work linking defense maturity to better health outcomes (Flannery & Perry, 1990; Olff et al., 1993), the results of this study used objective ratings of health based on medical records and defenses coded reliably from narratives and behavioral vignettes rather than from self report. These findings extend earlier work from our own longitudinal sample, in which more adaptive defenses in young adulthood (between ages 20 and 47) were not found to be significantly associated with later objective health after age 60 (Vaillant, 1993, 2000). Using this same sample, it appears that adaptive defenses in midlife (between ages 47 and 63) are associated with late-life health and mortality, and thus may present a viable target for interventions across the lifespan. Our results support Vaillant's (2000) hypothesis that physically and emotionally healthy aging involves the utilization of adaptive defense mechanisms.

Next, we found support for the hypothesis that social support mediates the relationship between adaptive mechanisms of defense and objective physical health. Consistent with the lifespan development model (Smith & Spiro, 2002), more adaptive defense mechanisms support the development of better relationships and social experiences, which thus contributes to lasting health. Interestingly, as participants aged the variance accounted for by the social support mediation decreased over time. In addition, the mediation results at age 80 were reduced to a statistical trend. This suggests that psychosocial factors from mid-life have a diminishing impact as people age from 70 to 80 and that the health of the aging individual may be affected by other factors (e.g., genetics).

Our findings have significance for health policy supporting the importance of mental health interventions aimed beyond specific diagnostic categories (e.g., depression) and more broadly at facilitating the development of more adaptive methods of coping. For example, a therapist may help an individual cope with a major loss less through denial, and more through acknowledging and working through his experience in useful ways. Thus, interventions aimed at facilitating adaptive personality functioning in midlife could

ultimately improve the ways that one maintains connections with family, friends, and community, which in turn may promote late-life physical health.

One of the unique strengths of this study is the prospective longitudinal design spanning decades. Most previous research examining defense mechanisms and health is cross-sectional (see e.g., Albuquerque et al., 2011; Eriksen et al., 1997; Flannery & Perry, 1990; Olff, 1999; Olff et al., 1993). In addition, we used a multi-method approach including clinician-coded personality data, health outcomes assessed objectively through medical records, and social support ratings derived from multiple sources (e.g., narrative interviews, self-report). Finally, this study contributes to the growing body of literature examining qualities of self and relationship functioning among individuals 70 years and above.

The study also has a number of limitations. First, the participants were socially and economically privileged white men who were specifically chosen in late adolescence for physical and psychological health. These men also had on average extremely high IQs, which is a protective factor of physical health in late life (Gottfredson & Deary, 2004). Caution generalizing these results to the larger population is necessary given the many protective factors associated with healthy aging characteristic of the sample. Other factors such as poverty, early mental and physical illness, lower IQ, poor education, and fewer resources may not only impact health but also access to stronger support networks in midlife. Next, the mediator in this study (social support) was not completely separated in time from the predictors and the outcome of health at age 70. There remains a need to examine these questions using data from other longitudinal studies, to more precisely track interrelationships among personality, social functioning, and physical health across the lifespan.

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Table 1

Correlations among defenses, traits, social support, and health variables ($N=90$).

	Maturity of defenses, age 47–63	Social supports, age 50–70	Health at age 70	Health at age 75	Health at age 80
Maturity of defenses, age 47–63	–				
Social supports, age 50–70	.46***	–			
Health at age 70	.29**	.33**	–		
Health at age 75	.24*	.28**	.78***	–	
Health at age 80	.25*	.25*	.66***	.85***	–
<i>M</i>	5.83	8.85	4.74	3.88	3.30
<i>SD</i>	1.92	2.82	1.92	1.90	1.86

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 2

Social support as a mediator of defense maturity and outcomes of physical health at ages 70, 75, and 80.

	Health (Age 70)				Health (Age 75)				Health (Age 80)			
	<i>F</i>	<i>df</i>	Adjusted <i>R</i> ²		<i>F</i>	<i>df</i>	Adjusted <i>R</i> ²		<i>F</i>	<i>df</i>	Adjusted <i>R</i> ²	
<i>Step 1</i>												
Health (dependent variable)												
Midlife defenses	.29**	1,88	.08		.24*	1,89	.05		.25*	1,87	.05	
<i>Step 2</i>												
Social support (dependent variable)												
Midlife defenses	.46***	1,84	.20		.46***	1,84	.20		.46***	1,84	.20	
<i>Step 3</i>												
Health (dependent variable)												
Social support	.35**	1,84	.10		.28**	1,83	.20		.25*	1,82	.05	
<i>Step 4</i>												
Health (dependent variable)												
Social support	.27*	2,82	.10		.24*	2,82	.06		.21+	2,81	.05	
Midlife defenses	.12				.09				.08			

+ *p* .10.

* *p* < .05.

** *p* .01.

*** *p* .001.