
Adaptive Mental Mechanisms

Their Role in a Positive Psychology

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Psychology needs a metric for positive mental health that would be analogous to the IQ tests that measure above-average intelligence. The Defensive Function Scale of the DSM-IV offers a possible metric. In the present article the author links the transformational qualities of defenses at the mature end of the Defensive Function Scale—altruism, suppression, humor, anticipation, and sublimation—to positive psychology. First, the methodological problems involved in the reliable assessment of defenses are acknowledged. Next, the use of prospective longitudinal study to overcome such difficulties and to provide more reliable definition and measurement of defenses is outlined. Evidence is also offered that, unlike many psychological measures, the maturity of defenses is quite independent of social class, education, and IQ. Last, evidence is offered to illustrate the validity of mature defenses and their contribution to positive psychology.

Since the days of alchemy, humanity has been fascinated with how to turn lead into gold. People are intrigued by the real-life alchemy of the oyster transforming an irritating grain of sand into a pearl. Rumpelstiltskin spinning straw into gold is a favorite fairy tale. In their laudable quest to relieve human suffering, however, both psychiatry and psychology have been less interested in positive transformations. Instead, they have been more concerned with how cold mothers and bad genes create disease and so turn gold to lead.

In contrast to psychiatry, however, psychology has made at least some effort to measure the positive as well as the pathological. Intelligence tests are a good example. In contrast to intelligence, however, most facets of positive human behavior—for example, creativity, maturity, and empathy—are extraordinarily difficult to measure. This article discusses efforts to conceptualize the mature defenses (aka, involuntary coping mechanisms and “healthy denial”). I argue that such a schema comprises a facet of and a possible metric for a positive psychology.

By way of introduction, there are three broad classes of coping mechanisms. First, there are the ways in which an individual elicits help from appropriate others: namely, *seeking social support*. Second, there are *conscious cognitive strategies* that people intentionally use to make the best of a bad situation (Lazarus & Folkman, 1984). Third, there are *involuntary mental mechanisms* that distort our perception of internal and external reality to reduce subjective distress. For

semantic consistency, the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 1994) has labeled these mental mechanisms *defenses* and has organized them in a hierarchical Defensive Function Scale. Included within the “high adaptive level” of *DSM-IV* are the defenses of anticipation, altruism, humor, sublimation, and suppression. These adaptive mental mechanisms “maximize gratification and allow conscious awareness of feelings, ideas and their consequences” (American Psychiatric Association, 1994, p. 752).

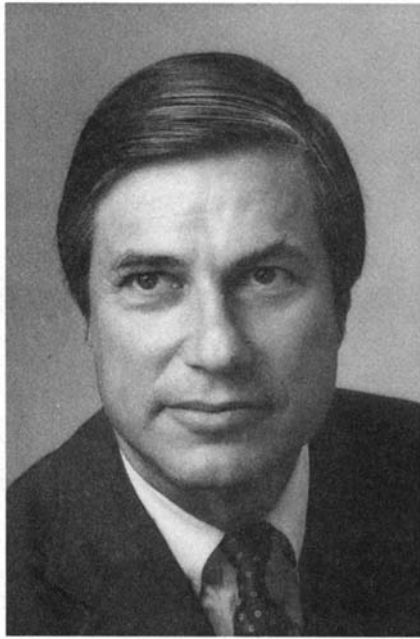
In many ways, the first two classes of coping are superior to the third. Most important, seeking social support and cognitive strategies are both under volitional control and can affect the real world. In three ways, however, the involuntary defenses or coping processes are superior to voluntary coping processes. First, as I demonstrate in this article, involuntary defenses are independent of education and social privilege. Second, they can regulate people’s perceptions of those internal and external realities that they are powerless to change. Third, the adaptive defenses can turn lead into gold. By this I mean such processes can serve as transformative agents in the real world.

Let me offer an analogy. If a person who cuts a small artery lacks the cognitive strategies (provided to health professionals through expensive education) to stop the hemorrhage and lacks the social supports of access to physicians (provided to the middle class through expensive health insurance), the person can still cope with the hemorrhage with inborn defenses. He or she can stop the bleeding through involuntary, transformative, and highly complex clotting mechanisms. Yet, such clotting mechanisms may be denied to royalty afflicted with hemophilia. In analogous fashion, when cognitive solutions and social supports are absent, the psychologically resilient—from all walks of life—achieve similar homeostatic alchemy through involuntary mental defenses that alter perception of internal and external reality.

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For example, at age 31, a suicidal but only partially deaf musician had written of his loss of hearing, "Oh, if I were rid of this affliction, I could embrace the world" (Forbes, 1969, p. 286). At 54, the utterly deaf but no longer suicidal musician immortalized Schiller's "Ode to Joy" ("Be embraced all ye millions with a kiss for all the world") in the lyrical, life-affirming chorus of his *Ninth Symphony*. But how can psychology differentiate the transformative denial that Beethoven deployed to overcome depression by writing a hymn to joy from the mental mechanisms of psychosis such as projection and psychotic denial? Clearly, the answer is important.

As a start, mature mental health always involves affect recognition. Beethoven did not totally deny his real depression, nor was he overwhelmed by it. Thus, we have evidence that Beethoven's defensive behavior (aka, creative product) did not reflect complete denial of affect as do less adaptive defenses. Throughout his composition of the *Ninth Symphony*, he remained conscious of his pain. For example, on a draft version of one instrumental recitative he had scribbled, "No, this would remind us too much of our despair" (Forbes, 1969, p. 892). Equally important was Beethoven's defensive use of sublimation, which not only made him feel subjectively better, but also was of objective value to the real world.

Adaptive defenses are essential to positive mental health. Defenses reduce conflict and cognitive dissonance during sudden changes in internal and external reality. If not modified, sudden changes result in anxiety and/or depression. First, defense mechanisms can restore psychological homeostasis by ignoring or deflecting sudden increases in affect and instinctual press. For example, when the Soviets liberated the first Nazi death camp, Maidanek, the *New York Times* denied its unbearable horror by reporting the news as a Soviet propaganda ploy. Second, defense mechanisms can provide a mental time out to mitigate changes in *reality* and self-image

that cannot be immediately integrated—for example, after major surgery or promotion. Third, defenses transmute unresolvable conflict with important people, living or dead. Finally, defenses soften conflicts of conscience—for example, after putting a parent in a nursing home. In short, defenses shield people from sudden changes in affect, reality, relationships, or conscience.

For many years, defense mechanisms have been deservedly unpopular in experimental psychology, because of difficulty in empirical verification. Over the past 20 years, the idea of involuntary adaptation has re-entered the literature of cognitive psychology under such rubrics as *hardiness* (Kobasa, Maddi, & Kahn, 1982), *self-deception* and *emotional coping* (Lazarus & Folkman, 1984), and *illusion* (Taylor, 1989). Defense mechanisms are clearly as important in reducing anxiety from cognitive dissonance as they are in minimizing anxiety from conflict between conscience and impulse.

In recent years, experimental strategies for studying defense mechanisms have improved (Cramer, 1991; Horowitz, 1988; Vaillant, 1992). Building on the work of Norma Haan (1963) at Berkeley and Elvin Semrad (1967) at Harvard, I have tried to operationalize defenses and to demonstrate their predictive validity (Vaillant, 1971, 1993). Over 30 years, such efforts have met with modest success, and the *validity* of an adaptive hierarchy of defenses appears clear (Vaillant, 1992). However, as Phoebe Cramer's (1991) encyclopedic review of the methodology for identifying and quantifying defenses has illustrated, no one has yet developed a method for assessing defenses that meets conventional standards for psychometric reliability.

A second reason that defenses have fallen from favor in psychology is that there is no commonly accepted language. For example, within 50 miles of San Francisco, there were recently six competing, nonoverlapping nomenclatures for involuntary coping mechanisms. Each nomenclature was used by a distinguished investigator of stress (Block & Block, 1980; Haan, 1977; Horowitz, 1988; Lazarus & Folkman, 1984; Moos & Billings, 1982; Weinberger, Schwartz, & Davidson, 1979). Rarely, however, did any investigator cite the work of his or her neighbors. The result has been semantic chaos. Recently, the *DSM-IV* (American Psychiatric Association, 1994) has offered a terminology, a glossary, and a tentative diagnostic axis to provide a common language.

Defenses, no matter how ingeniously assessed, reflect value judgments about mental process, as do process concepts in physics (e.g., forward motion and velocity). All three—velocity, forward motion, and defenses—depend on the vantage point of the observer and involve processes rather than static qualities like mass or intelligence. Nevertheless, if people wish to understand their own lives in time and space, these are judgments worth making.

To overcome relativity, reliability of defense recognition requires longitudinal study. Before I can assert that the *Ninth Symphony* represents the sublimation of Beethoven's conflict over abusive father figures, I need objective longitudinal evidence. First, I need Beethoven's own contemporaneously written diary to document both his despair and his anger at father figures over decades. Second, for objec-

tive assessment, I need behavioral evidence of his defense: a symphony (not just a pencil-and-paper response or a dream report). Finally, I need objective consensus that his creation was empathic art that others valued, not autistic lunacy that others mocked. Thus, the documented wild cheers of a contemporary, musically sophisticated, Viennese concert audience is more convincing than the value judgment of one 20th century, musically challenged American psychiatrist. Using such triangulation of real symptoms, autobiographical report, and contemporaneously assessed biographical fact to measure invisible mental process is analogous to surveyors using triangulation to assess the height of mountains they cannot climb.

As a method to study defenses, I have used three diverse 50-year prospective studies of lives. Using consensus definitions from the literature (Vaillant, 1971), I selected five mechanisms—humor, altruism, sublimation, anticipation, and suppression—that, first by hypothesis and then by empirical study, appeared adaptive in the three samples. The term *adaptive defense*, and its synonym *healthy denial*, have two connotations: The first is transformative (turning lead into gold), and the second is making the best out of a bad situation. Whether such a healing response is viewed as miraculous or merely a patch-up job depends on whether optimal wound healing is viewed as a scar or as a result of a delicate ballet of blood clotting and fibroblast migration—neither too much nor too little. Each adaptive or healthy defense involves the ballet of keeping idea and affect, subject and object clearly in mind while simultaneously attenuating the conflict (cognitive dissonance).

In nonconflictual situations, of course, the putative defense mechanisms of anticipation, altruism, and suppression seem quite conscious and voluntary. In highly emotionally charged situations, however, such deployment of these mechanisms can be seen as both transformative and making the best of a bad situation. A man with a criminal record for the first time “counting to ten” (suppression) while consciously examining his anger, rather than impulsively punching a policeman; a mother rehearsing affectively and realistically, rather than denying, the fact that her child is dying (anticipation); a survivor of child abuse, rather than abusing her own children, working in a shelter for survivors of abuse (altruism) are such examples. Such behaviors emerge with maturation as delicate transformative mental balancing acts and not as a result of good advice and self-help cognitive strategies.

The Study of Adult Development

The Study of Adult Development provided the three cohorts of individuals that were used as a prospective and empirical means of triangulating and validating defensive behaviors. Each cohort had been prospectively studied for over half a century: the “College” sample born about 1920 (Heath, 1945), the “Core City” sample of inner-city men born about 1930 (Glueck & Glueck, 1950), and the “Terman” sample of gifted women born about 1910 (Terman, 1925).

For all three samples, the basic methodology of the Study of Adult Development was to keep raters of psychological health and prospective behavioral outcome unaware

of defense assessment and to keep raters of defenses unaware of evidence of positive mental health and future adaptation. Taken individually, these three now elderly Caucasian samples can hardly be viewed as representative of the general population. However, the three samples have the virtues of being vastly different from each other and belonging to historical birth cohorts up to 20 years apart. Within each sample, there was considerable homogeneity. Thus, the between-group *similarities* and the within-group *differences* may be generalizable to some other samples. More important, prospective study permitted defensive altruism to be distinguished from simple kindness and defensive projection to be distinguished from the vigilant recognition of real persecution.

The College Sample

The Grant Study (Heath, 1945; Vaillant, 1977) began at the Harvard University Health Services in 1938. The study was underwritten by W. T. Grant because, “Large endowments have been given and schemes put into effect for the study of the ill, the mentally and physically handicapped. . . . Very few have thought it pertinent to make a systematic inquiry into the kinds of people who are well and do well” (Heath, 1945). Sixty years ago, then, the Grant Study anticipated the need for a positive psychology.

In the selection process, about 40% of each Harvard class was arbitrarily excluded for academic reasons. The health service records of the remaining 60% of each class were then screened, and half were excluded because of evidence of physical or psychological disturbance. The college deans then selected one third of the remaining 300 men who they thought would do well. Between 1939 and 1942, 268 sophomores were selected for study. For half a century, all but 20 of the men have continued to participate in this study of positive psychology with remarkable loyalty. They have received questionnaires about every 2 years, physical examinations every 5 years, and interviews about every 15 years.

Socioeconomically, the College sample men were drawn from a privileged group but not exclusively so. Although one third of the men’s fathers had some professional training, one half of the men’s parents never graduated from college. Although one half of the men had some private education, half of the men were on scholarship and/or had to work during the academic term to earn tuition. In adult life, the College sample enjoyed the income and social status of corporate managers, yet they drove the battered cars and pursued the hobbies, politics, and lifestyle of college professors.

The Core City Sample

These 456 men represent a very different cohort but one also chosen for relative mental health. In junior high school, they were selected as nondelinquent controls for a prospective study of juvenile delinquency. The study was conducted by Sheldon and Eleanor Glueck at Harvard Law School and led to their landmark book *Unraveling Juvenile Delinquency* (Glueck & Glueck, 1950, 1968). Like the College men, the Core City men were studied originally by a multidisciplinary team of physicians, psychologists, psy-

chiatrists, social investigators, and physical anthropologists. The Core City men were interviewed at ages 14, 25, 32, and 47 (Vaillant, 1995).

The Core City sample came from the 60% of Boston census tracts with the highest rates of juvenile delinquency. The boys' average IQ was 95, and 61% of their parents were foreign born. In childhood, half of the Core City men had lived in clearly blighted slum neighborhoods. Half came from families known to five or more social agencies, and more than two thirds of their families had recently been on welfare. Over the years, however, this group has experienced marked upward social mobility (Long & Vaillant, 1984).

The Terman Women Sample

Through the cooperation of Robert Sears and Albert Hastorf, I obtained access to a Stanford University (Terman women) cohort of gifted women studied since 1920. The 90 women that make up the current study sample are a representative subsample of the 672 women in Terman's original cohort of gifted California public school children (Holahan & Sears, 1995; Terman, 1925; Terman & Oden, 1959).

The high intelligence of the Terman women—mean IQ of 151—was a social asset. Their mental health was demonstrably better than that of their California classmates. They showed significantly more humor, common sense, perseverance, leadership, and even popularity than their school peers. Up to the age of 78, the mortality of the Terman women has been only half of what would be expected for White American women in their birth cohort.

Investigators followed the Terman sample by questionnaire every five years and by personal interview in 1940 and 1950. In 1987, Vaillant and Vaillant (1990a) selected a representative subsample. Of the 90 women selected, 29 had died and 21 of the surviving women refused to interview, some because of poor health. We reinterviewed the remaining 40 women.

Adaptive or Mature Defenses

Adaptive or mature defenses (altruism, sublimation, suppression, humor, anticipation) are common among the mentally healthy and become more salient as individuals mature from adolescence to midlife (Vaillant, 1977). In keeping with the conceptualization of positive psychology, the association of mature defenses with mental health remains whether health is measured by subjective happiness, psychosocial maturity, occupational success, richness and stability of relationships, or absence of psychopathology (Vaillant, 1992). Individuals with brain damage (e.g., alcohol dependence, schizophrenic relapse, multiple sclerosis) replace adaptive defenses with more maladaptive mechanisms, most notably projection.

Table 1 schematizes the defenses discussed in this article within the adaptive levels suggested by *DSM-IV*. The table provides an oversimplified schema for the mutually exclusive definitions that contrast the five adaptive defenses listed above with less adaptive mechanisms. Each defense has been characterized by the extent to which it denies or distorts subject and object and idea and affect in the experience of and

expression of impulse. For example, defense mechanisms can allow a person to ignore the affect (isolation, intellectualization), to ignore the cognitive representation of the affect (repression), to reverse the direction of an impulse (make the self the object; projection), or to make the object the self (suicide or passive aggression). Each defense has also been characterized by the way in which it modifies the four lodestars of conflict: affect, reality, conscience, and relationships. The high-adaptive-level defenses provide the most balanced response to such involuntary homeostatic distortions of inner and outer reality.

To the beholder, adaptive mechanisms appear as convenient virtues, and there is rarely a therapeutic reason to alter them. Although closer to consciousness than mechanisms like projection and repression, mature mechanisms cannot be voluntarily deployed. No one is more transparent than someone trying to use humor or altruism; No one is more angry looking than someone consciously suppressing rage; and when depressed just try writing Beethoven's *Ninth Symphony* on purpose.

In keeping with positive psychology, adaptive defenses often appear as moral to the observer as maladaptive defenses appear immoral. The prejudice of projection and the tantrums of acting out appear to others as sins. In contrast, doing as one would be done by (altruism), a stiff upper lip (suppression), planning for the future (anticipation), the ability not to take one's self too seriously (humor), and "turning lemons into lemonade" (sublimation) are the very stuff of which a positive psychology should be concerned.

Let me elaborate on the transformative nature of each of five mature mental mechanisms schematically defined in Table 1.

Altruism

When used to transform conflict, altruism involves getting pleasure from giving to others what people would themselves like to receive. For example, victims of childhood sexual abuse often pathologically cut themselves (turning anger against the self), abuse children (acting out), or use "neurotic" compromises such as becoming frigid or joining convents (reaction formation). Alternatively, and transformatively, altruistic victims of child abuse might work in shelters for battered women and in support groups or hotlines for abuse victims. Often altruism is an adaptive outgrowth of the defense of reaction formation, a mechanism that can maladaptively make the person's desires all bad and the needs of others all good. Using reaction formation, an ex-drinker who suddenly declares drinking as a filthy habit annoys his friends. Using altruism, the ex-alcoholic who serves as a sponsor to a new Alcoholics Anonymous member achieves a transformative process enjoyed by giver and receiver.

My wife, five months pregnant, was interviewing a couple from the Core City sample to whom our study offered no compensation. The greatest pain in their life was having lost six children through Rh incompatibility. As my wife got up to leave, the childless wife, whose grief and envy can only be imagined, gave my wife a handsome, handmade baby sweater. The lives of everyone in the room had been suddenly enriched.

Table 1
Differential Identification of Defenses

Levels of defense in DSM-IV (APA, 1994)	Sources of conflict					Expression of impulse		
	Affects/instinct/ desire	Conscience/ culture	Relationships/ people	Reality	Self/subject	Idea	Affect	Object
Defensive dysregulation								
Delusional projection	Disavowed	Exaggerated	Distorted	Distorted	Made object	Exaggerated	Exaggerated	Made self
Psychotic denial	Ignored	—	Ignored	Ignored	Omnipotent	Ignored	Ignored	Ignored
Psychotic distortion	Exaggerated	Ignored	Distorted	Distorted	Omnipotent	Altered	Altered	Generalized
Action level								
Passive aggression	Turned on self	Exaggerated	Exaggerated	Made object	—	—	Ignored	—
Acting out	Exaggerated	Ignored	Altered	—	Omnipotent	Ignored	Ignored	Generalized
Disavowel or image-distortion level								
Projection	Disavowed	Exaggerated	Distorted	Exaggerated	Made object	—	—	Made self
Fantasy	—	Ignored	Taken inside	—	Omnipotent	—	Diminished	Within self
Compromise formation level								
Dissociation	Altered	Altered	Exaggerated	—	—	—	Altered	—
Displacement	—	—	Altered	Minimized	—	—	—	Displaced
Isolation	Minimized	Exaggerated	Distanced	—	—	—	Ignored	—
Repression	Disguised	—	—	Minimized	—	Ignored	—	Ignored
Reaction formation	Ignored	Exaggerated	—	—	—	Reversed	Reversed	—
High adaptive								
Altruism	Minimized	Exaggerated	—	—	—	—	—	Made self
Sublimation	Made play	—	—	—	—	—	Diminished	—
Suppression	Minimized	Minimized	Minimized	Minimized	—	—	—	—
Anticipation	—	—	—	—	—	Diminished	Diminished	—
Humor	—	Minimized	—	—	—	Exaggerated	Altered	—

Note. Dashes indicate source of conflict or expression of impulse unaltered. DSM-IV = Diagnostic and Statistical Manual of Mental Disorders (4th edition), APA = American Psychiatric Association.

Sublimation

The sign of a successful defense is neither careful cost accounting nor shrewd compromise, but rather psychic alchemy. Upon an inanimate Attic vase John Keats discovered—and shared—an attenuated yet passionate sexuality. In “Ode on a Grecian Urn,” Keats conveyed a miraculous concept: “More happy, happy love! / Forever warm and still to be enjoyed. / Forever panting and forever young.” With marvelous control of language Keats turned lust, perhaps even imminent rape—“What maidens loth? / What mad pursuit? What struggle to escape?”—into more happy love. A less poetic member of the study wrote, “I have twice the sex drive of my wife. We adjust ourselves by varying our sex play to suit each other. We believe that lovemaking should be practiced as an art!”

Thus, sublimation allows an indirect resolution of conflict with neither adverse consequences nor marked loss of pleasure. Unlike the autistic fantasy of the child and the schizophrenic, artists can peddle their most private dreams to others. In contrast, the mechanism of acting out—rape—dissipates the torrent of our unmodulated affect on strangers, and reaction formation dams such affect expression completely.

Finally, sublimation does more than make affect acceptable; it also makes ideas exciting. In terms of their Harvard grades and tested intellectual aptitudes, the men in the College sample with brilliant teaching careers at Stanford and Harvard were not more gifted than fellow study members teaching joylessly at mediocre institutions. Too often the less successful professors in the College sample used displacement and isolation so compulsively that their cognitive interests were stripped of affect and passion. In every facet of their lives—not just their teaching and publishing—the successful professors were more comfortable in coloring their ideas with the pigment of emotion (Vaillant, 1977).

Suppression

Suppression (stoicism) is not as elegant as sublimation because suppression always sacrifices beauty for truth. Suppression has none of the humanity of altruism or humor, and suppression is often regarded by psychotherapists as a vice, not a virtue. When used effectively, however, suppression is analogous to a well-trimmed sail; every restriction is precisely calculated to exploit, not to hide, the winds of passion.

Suppression involves the semiconscious decision to postpone paying attention to a conscious impulse and/or conflict. A critical difference between suppression and repression, between suppression and isolation, and between stoical suppression and Spartan reaction formation is the degree to which suppression allows all the components of conflict to exist at least partially in consciousness (cf. Table 1). The distinction between suppression and Pollyanna's dissociation or “neurotic denial” is more complex. Both the stoic person and the person behaving like Pollyanna note that clouds have silver linings, but Pollyanna leaves her umbrella at home. Evidence that suppression is not a conscious cognitive strategy as many believe is provided by the fact that jails would empty if delinquents could learn to just say *no*.

As an example of suppression, the normal life tempo of one highly energetic College sample man was to work a 60-hour week as chief executive officer of two large corporations and then run for six miles on Sunday to relax. However, he described a navy diving accident that took place during World War II in the following manner: He was 40 feet underwater; his air valve was jammed; his radio did not work; and he knew that only eight minutes of air were left in his diving helmet. He recognized that there was nothing that he could do for himself. “I thought my end had come . . . struggling would not have helped and used maybe three times as much air. I didn't pray. I merely sat, very much like an old cow, and waited for help—very unhappy.” He knew his feelings, and he knew they would not help, so he suppressed them until he was rescued. The delicate mental balance involved in successful suppression is as voluntary and as involuntary as walking on a tight-rope. Such balance seems easy for the accomplished, coordinated acrobat and seems utterly impossible and anxiety provoking for everyone else.

Anticipation

As with altruism, the use of anticipation is often voluntary and independent of conflict resolution. Rather, it is in cases of “hot cognition” that anticipation becomes an involuntary coping skill. If suppression reflects the capacity to keep current impulse in mind and control it, anticipation is the capacity to keep affective response to an unbearable future in mind.

The defense of anticipation reflects the capacity to perceive future danger affectively as well as cognitively and by this means to master conflict in small steps. In the 1950s, as scientists began the deliberate study of healthy adaptation, Irving Janis (1958) discovered that moderate amounts of anxiety before surgery promoted adaptation. At the National Institute of Mental Health, David Hamburg and his colleagues (Friedman, Chodoff, Mason, & Hamburg, 1963) noted the value of anticipatory mourning in parents of children with leukemia. Psychiatrists responsible for preparing Peace Corps volunteers noted that volunteers' capacity to anticipate future affective difficulty better predicted subsequent adaptation than did their apparent emotional stability on psychological tests (Ezekiel, 1968).

Anticipation differs in an important way from using isolation and intellectualization to make soothing “lists.” Anticipation involves more than just the ideational work of cognitive planning. Anticipation involves both thinking *and* feeling about the future. For example, consider legendary aviators, like Charles Lindbergh and Chuck Yeager. They calmly survived exciting flying careers by dealing with stress as Mithradates did with poison—taking a little at a time. To have underestimated danger would have been fatal. To have exaggerated danger would have been emotionally incapacitating. Thus, they worried in advance, they made lists, and they practiced. Then, appreciating that they had prepared as well as they could, they relaxed. Like suppression and altruism, anticipation is so easy to prescribe but so difficult to do.

Humor

We all recognize that humor makes life easier. As S. Freud (1905/1960) suggested, "Humor can be regarded as the highest of these defensive processes," for humor "scorns to withdraw the ideational content bearing the distressing affect from conscious attention, as repression does, and thus surmounts the automatism of defense" (p. 233). Humor permits the expression of emotion without individual discomfort and without unpleasant effects on others. Humor, like anticipation and suppression, is such a sensible coping device that it ought to be conscious, but almost by definition, humor always surprises people. Like the other mature defenses, humor requires the same delicacy as building a house of cards—timing is everything. The safety of humor, like the safety of dreams during REM sleep, depends on cataplexy. People see all and feel much, but they do not act.

Humor keeps both idea *and* affect in mind. Mature humor allows people to look directly at what is painful, whereas dissociation and slapstick distract people so that they look somewhere else. Much of humor is lost in the retelling. Thus, unlike Beethoven's sublimation, humor is difficult to illustrate. Humor, like a rainbow, is real but forever evades our grasp.

Adaptive or Health-Promoting Defenses May Be Independent of Social Class and Gender

The study assessed defenses of the Core City men and of the College men at age 47 and of the Terman women at age 77. Defenses were identified by behavioral vignette (Vaillant, 1992). Then, the ratio of adaptive level defenses to less adaptive defenses was calculated, and the ratio was converted to a 1-to-9 scale. Table 2 illustrates that such quantification of adaptiveness of defenses was relatively independent of years of education, IQ, and parental social class. Admittedly, within each cohort the range of socioeconomic status was truncated; nevertheless, within the Core City cohort both IQ and education predicted future occupational prestige and social class ($p < .001$)—just not the adaptiveness of defenses.

Table 2
Correlation of Social Antecedents With Adaptiveness of Defenses

Antecedent	Adaptiveness of defenses		
	College ($n = 154^a$)	Core City ($n = 189^a$)	Terman ($n = 40$)
Years of education	.13	.10	.33*
IQ	.04	.14	.07
Parental social class	.11	.00	.13

^a Sample size is reduced. To control confounders, men with IQs less than 86, depression, alcohol dependence, and schizophrenia were excluded.

* $p < .05$. (Spearman rank correlation coefficient was used.)

If the three samples are contrasted with each other, 34% of the Terman women, 25% of the privileged College men, and 22% of the less socially and intellectually privileged Core City men manifested defenses predominantly at the adaptive level. These differences were not significant and can be attributed to differences in the original rules for selection.

Predictive Validity

Longitudinal study not only facilitated rater reliability in the identification of defenses (Vaillant, 1992), but also facilitated the demonstration of predictive validity. Thus, roughly 20 years after the relative adaptiveness of defenses was rated, the physical health and the psychosocial adjustment of the study men was assessed by raters unaware of the conditions of the participants' lives before age 50. Separate ratings were obtained for evidence of subjective and objective mental and physical health.

Table 3 illustrates the power of scaled adaptiveness of defenses to predict multiple facets of positive health. For contrast, Table 3 also presents the power of attained social class (measured by years of education) and the power of trait neuroticism measured contemporaneously at age 65 by the NEO Personality Inventory (Costa & McCrae, 1985; McCrae & Costa, 1985) to predict the same variables. Because mental illness can lead both to maladaptive defenses and to poor future health, men with alcohol dependence, major depressive disorder, schizophrenia, or IQs less than 85 were omitted from the tests of predictive validity in Table 3. Had mentally ill participants been included, the predictive power of defense choice would have been greater.

As shown in Table 3, psychosocial adjustment (objective), social supports (objective), and marital satisfaction (subjective) were assessed by independent raters who integrated data from seven questionnaires from the College and Core City men and two questionnaires from the wives of the College men. Psychosocial adjustment from age 50 to age 65 was assessed by evidence of job promotions and enjoyment, marital stability, games with others, and no use of psychiatrists or tranquilizers (Vaillant, Meyer, Mukamal, & Soldz, 1998; Vaillant & Vaillant, 1990b). Social supports from ages 50 to 70 were assessed by evidence of close relations with wives, children, siblings, and social network, as well as by strength of religious affiliation, the presence or absence of a confidante, and games with friends (Vaillant et al., 1998).

Joy in living (subjective) was quantified by summing each man's satisfaction over the past 20 years (on a 5-point scale) in four life areas (marriage, children, job, and friends) and by then adding his best score from one of four additional areas (hobbies, sports, community activities, or religion) (Vaillant, 1999). Physical functioning (subjective) for the College men from ages 70 to 75 and for the Core City men from ages 60 to 65 was assessed by repeatedly monitoring instrumental activities of living (e.g., ability to climb stairs, walk two miles, carry suitcases, and drive at night; Vaillant, Orav, Meyer, McCullough, & Roston, 1996).

Finally, Table 3 illustrates that adaptive defenses transform only the perception of reality, not reality itself. Thus, adaptive defenses predicted the absence of *subjective*

Table 3
Late Life Consequences of Adaptive Defenses at Ages 20–47

Evidence	Core City (n = 137 ^a)			College (n = 154 ^a)		
	Years of education	Adaptiveness of defenses	Neuroticism	Years of education	Adaptiveness of defenses	Neuroticism
Objective evidence						
Income (midlife)	.25**	.25**	-.08	.05	.28***	-.08
Psychosocial adjustment (ages 50–65) (Vaillant & Vaillant, 1990b)	.16	.51***	.08	-.01	.34***	-.24**
Social supports ^b (Vaillant et al., 1998)	.12	.44***	.00	.13	.34***	-.15
Subjective evidence						
Joy in living ^b	.14	.37***	-.18	.03	.35***	-.34***
Marital satisfaction (midlife)	.01	.30***	-.16	.09	.18*	-.04
Subjective physical functioning ^b	.07	.32***	-.16	.13	.23*	-.28**
Objective physical health ^c						
Objective physical health decline	.09	.14	-.09	.01	.04	-.13

Note. Neuroticism was measured with the NEO Personality Inventory.

^a Sample size is reduced because men who died before age 65 are excluded. ^b Measured at age 65 for the Core City men and measured at age 75 for the College men. ^c 1 = well, 2 = minor irreversible illness, 3 = chronic illness, 4 = disabling illness, 5 = dead (Vaillant, 1979). Measured at age 60 for Core City men and at age 70 for College men.

* $p < .05$. ** $p < .01$. *** $p < .001$. (Spearman rank correlation coefficient was used.)

physical disability—up to 30 years later—but such defenses did not predict physical health decline (objective) assessed by an independent internist.

The point of Table 3 is that the relative adaptiveness of defenses (measurement described in Vaillant, 1992, 1993, and schematized in the *DSM-IV*) may offer as good a metric for positive mental health (Vaillant & Schnurr, 1988) as there is. For two very socioeconomically diverse samples of men, income, objective psychosocial adjustment, social supports, marital satisfaction, subjective physical functioning, and joy in living were more highly correlated with adaptive defenses measured 20 years earlier than with either education or neuroticism.

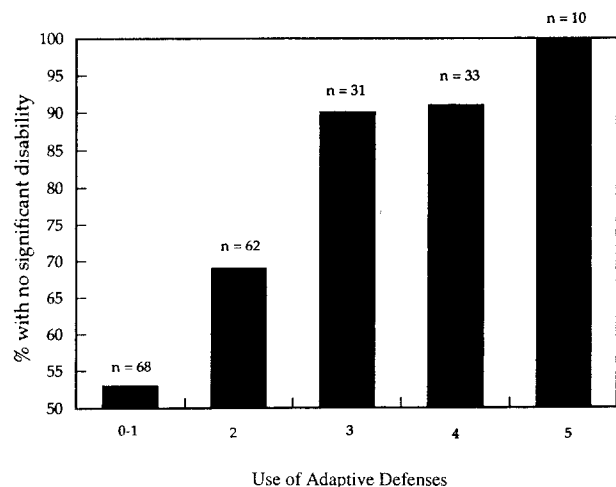
Specific Examples

Psychology needs to know more not only about the measurement of positive mental health but also about how people exposed to severe risk factors maintain positive mental health. I address four major risk factors: childhood poverty, the physical limitations of old age, stressful life events, and severe combat. First, the 70 Core City men who manifested the *most* adaptive defenses were just as likely to have come from welfare families in Social Class V (Hollingshead & Redlich, 1958) as were the 73 men with the *least* adaptive defenses. In contrast, as adults only 1% of men with the most mature defenses but 21% of men with the least mature defenses were in Social Class V. In short, adaptive defenses may catalyze escape from poverty.

Second, Figure 1 depicts the subjective physical functioning at age 65 of those Core City men who were still in good physical health at age 50. In other words, the figure includes only those men whose defense levels could not have been impaired by prior poor health. The more dominant their

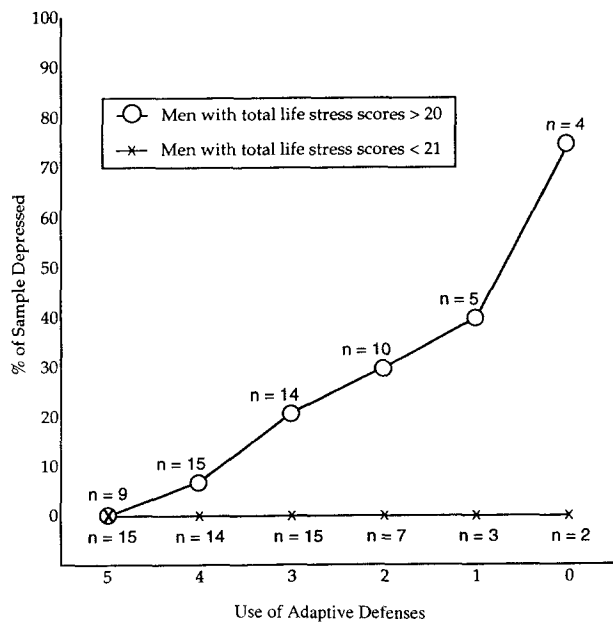
use of adaptive defenses between ages 20 and 47, the more likely they were at 65 to report being able to climb stairs, walk long distances, and engage in vigorous physical activities that they enjoyed. As Table 3 shows, however, their objective physical health was uncorrelated with defense level.

Figure 1
Core City Men Without Disability at Age 50 Who Were Still Without Disability 15 Years After the Initial Study



Note. The percentage of men with no significant disability was based on a subjective disability score of 10 through 14. This meant that the men had not given up any major activity and were still able to move heavy furniture and/or chop wood, walk two miles, and climb two flights of stairs without resting, albeit sometimes more slowly. Use of adaptive defenses was rated on a scale from 0 (*unimportant or absent*) to 5 (*style dominant*).

Figure 2
Likelihood of Depression Covaried With Total Life Stress and With Adaptiveness of Defenses



Note. Use of adaptive defenses was rated on a scale from 0 (unimportant or absent) to 5 (style dominant).

Third, the number of stressful life events in the adult lives of the College men from ages 20 to 60 was studied prospectively (Cui & Vaillant, 1996). The number and severity of such life events both predicted—and resulted from—the occurrence of major depressive disorder. Figure 2 illustrates that major depressive disorder occurred *only* among men with high life stress scores. However, the men who deployed the most adaptive defenses could still experience multiple stressful life events without risk of major depression.

Finally, adaptive defenses also mitigated the strong association between severe combat and later symptoms of post-traumatic stress disorder (PTSD) among the College sample. (In our study, symptoms of PTSD could be almost entirely explained by severity of World War II combat carefully quantified in 1946; Lee, Vaillant, Torrey, & Elder, 1995; Wells & Woods, 1946.) Of the 33 College men who experienced the most severe combat, the 16 men who deployed most adaptive defenses reported an average of 0.19 PTSD symptoms. The 17 men with less adaptive defenses who had had similarly high combat exposure reported an average of 1.70 PTSD symptoms, $t(31) = 2.75$, $p = .01$, two-tailed. It is significant that prior to the war, the two groups of men did not differ in physical symptoms with stress, and in late middle life they did not differ in neuroticism.

How Do Defenses Work?

How do mature defenses work to promote a positive psychology (enhanced ability to work, love, and play) and at the same

time to reduce conflict and cognitive dissonance? Table 1 presented a range of defenses rank ordered as in the *DSM-IV*. The *DSM-IV* suggests that the mechanisms at “the high adaptive level” not only maximize gratification but also “promote an optimum balance among conflicting motives” (American Psychiatric Association, 1994, p. 752). Again, whether one views such a response as making the best of a bad situation or as transformative depends on the vantage point of the observer. Thus, unlike less adaptive mechanisms, mature defenses synthesize and attenuate rather than deny and distort conflicting sources of human behavior like conscience, reality, interpersonal relations, and emotions. The best-of-a-bad-situation point of view would note that predominant use of adaptive defenses simply means that such individuals did not cope by using less balanced mechanisms like schizoid fantasy and projection, which are strongly predictive of poor outcomes. Unlike *acting out*, which denies conscience, or reaction formation, which denies emotion, or *schizoid fantasy* which denies real people, or projection, which denies the subject, or psychotic defenses, which deny objective reality, mature defenses elegantly balance and attenuate these multiple sources of conflict. Ballet dancing, Albert Rothenberg’s “Janusian creativity,” Beethoven producing a symphony fueled by despair and rage, people with physical disabilities deriving hope and self-esteem from helping others with disabilities all reflect the transformative nature of achieving psychic balance.

Beyond the above suggestions, psychology really does not know how defenses work. Do adaptive defenses reflect inborn traits (e.g., perfect pitch or a capacity for higher mathematics)? Or do adaptive defenses reflect traits that are acquired through education and maturation (e.g., good diction or a graceful backhand)? Should psychology view adaptive defenses as virtues (like empathy and creativity)? Or should psychology view such defenses as adaptive self-deceptions to resolve conflict as did Anna Freud when she quipped that altruism came not from the goodness “but from the badness of his heart” (Sandler & Freud, 1985, p. 176)? I believe that the correct answer to all four questions is *yes*, but more research is needed.

As Table 2 shows, the etiology of adaptive defenses is as obscure as the etiology of creativity or athletic prowess. Although genes, social environment, and the absence of brain disease undoubtedly each play a role, the association of adaptive defenses with positive psychology is most pronounced among individuals from dysfunctional families (Vaillant, 1993). The best definition of creativity—or of an adaptive defense—is putting something of value in the world that was not there before. It is the transformative, creative quality that makes the adaptive defenses more than just healthy wound healing.

Conclusion

This article raises questions that must be solved if psychologists are to develop a science of positive psychology. First, how should psychology quantify positive mental health? At present, psychology has no metric except perhaps scores of greater than 85 on the *DSM-IV*’s Axis V (Global Assessment of Functioning). If more reliable meth-

ods for assessing the relative maturity of defenses can be developed, psychology may gain a means of quantifying the theoretical formula for positive mental health that Marie Jahoda (1959) offered to psychology 40 years ago. She suggested the same synthesis between affective life and practical reality that is reflected in the conceptualization of adaptive-level defenses. Jahoda suggested that mentally healthy individuals should be oriented toward the future and efficient in problem solving. They should be resistant to stress and perceive reality without distortion. They should possess empathy and be able to love and to play as well as to work. They should remain in touch with their own feelings. In short, they should manifest anticipation, suppression, altruism, humor, and sublimation.

In addition, psychology needs to understand how best to facilitate the transmutation of less adaptive defenses into more adaptive defenses. My own suggestions (Vaillant, 1995) have been first to increase social supports and interpersonal safety and second to facilitate the intactness of the central nervous system (e.g., rest, nutrition, and sobriety). However, the newer forms of integrative psychotherapies also can catalyze such change, and throughout this journal issue there are further clues.

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