

# **On Energy, Personality, and Health: Subjective Vitality as a Dynamic Reflection of Well-Being**

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**ABSTRACT** In this article, we examine subjective vitality, a positive feeling of aliveness and energy, in six studies. Subjective vitality is hypothesized to reflect organismic well-being and thus should covary with both psychological and somatic factors that impact the energy available to the self. Associations are shown between subjective vitality and several indexes of psychological well-being; somatic factors such as physical symptoms and perceived body functioning; and basic personality traits and affective dispositions. Subsequently, vitality is shown to be lower in people with chronic pain compared to matched controls, especially those who perceive their pain to be disabling or frightening. Subjective vitality is further associated with self-motivation and maintained weight loss among patients treated for obesity. Finally, subjective vitality is assessed in a diary study for its covariation with physical symptoms. Discussion focuses on the phenomenological salience of personal energy and its relations to physical and psychological well-being.

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Feeling really "alive" is a familiar yet notably variable aspect of human experience. People regularly speak of being particularly alive or invigorated in certain circumstances or following certain events, whereas in other contexts they can feel "dead" or drained. This positive sense of aliveness and energy refers to more than merely being active, aroused, or even having stored caloric reserves. Rather, we believe it concerns a specific psychological experience of possessing enthusiasm and spirit that we refer to as vitality. Individuals vary in their experience of vitality as a function not only of physical influences (e.g., states of illness and fatigue), but also psychological factors (e.g., being in love, having a mission, being effective). Because of its phenomenological centrality and its seeming covariation with both physical and psychological circumstances, the subjective feeling of aliveness and vitality potentially represents a significant indicator of personal well-being. Yet to date this experience of vitality has received little direct focus from researchers.

The purpose of this article is to investigate the phenomenon of subjective vitality, defined as one's conscious experience of possessing energy and aliveness. Our investigation is both conceptual and empirical, beginning with a formulation of the theoretical meaning of subjective vitality and applying the formulation in a series of studies focused on this attribute. As a starting assumption, we view subjective vitality as a reflection of both organismic and psychological wellness (Cowen, 1994; Diener, 1984; Ryff, 1995) and therefore expect it to be influenced by both psychological and somatic factors. As a marker of wellness, subjective vitality has the advantage of being a highly accessible, phenomenologically based variable that is content-free with respect to external criteria of well-being such as objective success, health, social supports, or aspirational attainments. It is also a variable that can be meaningfully placed within both biological and psychological theories of human functioning.

Regarding psychological influences and concomitants, we draw on the frameworks of organismic psychology to conceptualize subjective vitality as the experience of having positive energy available to or within the regulatory control of one's self. Accordingly, to the degree that one is free of conflicts, unburdened by external controls, and feeling capable of effecting action, then one should report higher vitality. That is, vitality corresponds to the experience of oneself as a potential "origin" (deCharms, 1968) of action. Greater subjective vitality should also accompany the experiences of autonomy and integration (Deci & Ryan, 1991) or self-actualization (Rogers, 1963; Sheldon & Kasser,

1995) and other variables relating to the perception of oneself as a "fully functioning" person (Rogers, 1961). By contrast, conflicts and demands upon the self that threaten self-regulation and actualization, particularly those associated with feeling a lack of effectance, autonomy, or relatedness, are expected to diminish vitality (Ryan, Deci, & Grolnick, 1995). Finally, feelings of arousal or energy that are not typically associated with personal control, such as jitteriness, anxiety, or pressure, are expected to be unrelated, or negatively related, to a sense of vitality.

Subjective vitality is also expected to be influenced by somatic factors. The experience of vitality should be facilitated by a healthy organism and be more evident when basic bodily functions are robust and able to be effectively exercised. In contrast, somatic factors that drain one's available energy or block effective functioning should be associated with diminished subjective vitality (Stewart, Hays, & Ware, 1992). Additionally, health-related stressors, especially those that represent potential threats to one's autonomy or effectance, are expected to negatively affect subjective vitality. In this view, although physical challenges, injuries, or disease may influence subjective vitality, their impact may be tempered by the meaning or functional significance of such challenges with respect to the self.

Before turning to investigations of these general hypotheses, we shall first review previous theoretical and empirical approaches to vitality. We then outline a theoretical perspective on subjective vitality that ties this felt sense of energy to the ideas of organization and self-regulation, and, in turn, suggests hypotheses concerning the relations between subjective vitality and various aspects of mental and physical well-being.

### Vitality: History and Theories

Concepts concerning organismic energy or vitality have been a theoretical focus in many schools of thought concerning human functioning and health. Perhaps the best-known theory positing a relation between psychological health and energy is that of Freud, whose "economic viewpoint" (Rapaport, 1960) suggests that each of us has a limited amount of psychic energy derived from Eros, the life drives (Freud, 1923/1962). For Freud and later ego psychologists (e.g., Hartmann, 1958; Nunberg, 1931), the more that people are free of repression and conflict and therefore have access to conflict-free energy derived from Eros, the more they will manifest vitality, creativity, and energy. Jung

(1960), Reich (1951), Winnicott (1986), Perls (1973), Lifton (1976), and other psychodynamic theorists also posit energy-related constructs and, despite differences in approach, converge on the idea that conflict resolution and integration are associated with an increased availability of energy to one's ego, or self. Although psychodynamic approaches have been criticized for postulating concepts of energy that are highly abstract and only loosely observable, the apparent variations in people's vitality as a function of dynamic factors has led to a continuing consideration of such issues within clinical theories (Levine, 1979).

Eastern perspectives on wellness also hold a central place for vitality-related concepts (Cleary, 1991). For example, the Chinese concept of *Chi* represents, in part, a vital force or energy that is the source of life, creativity, right action, and harmony (Jou, 1981). In Japan, the concept of *Ki* similarly entails energy and power on which one can draw and relates to physical, mental, and spiritual health. Balinese healers attempt to mobilize *bayu*, a vital spiritual or life force that varies among individuals, and represents what is needed to live, grow, and resist illness (Wikan, 1989). Also attesting to the importance of vitality-related concepts in Eastern thought are numerous health practices oriented toward increasing the influence of vital energies, such as acupuncture, reiki, yoga, and herbal treatments. In these approaches, vitality represents an active inner force that facilitates mental and physical health.

Concepts of energy and vitality have also concerned applied health professionals. For example, Selye (1956), in his well-known theory of stress, proposed that individuals possess a limited reservoir of adaptation energy that is critical in the maintenance of health. He argued that adaptation energy differs from caloric energy, and its nature is largely unknown. However, Selye felt that people use this energy when facing environmental and disease stressors, and thus it represents a principal factor in resilience.

Theoretical perspectives on vitality, however, have been relatively disconnected from empirical work on the topic, which has in recent years been increasing, particularly in health-related domains. McNair, Lorr, and Doppleman (1971) stimulated work on this topic through their development of the Profile of Mood States (POMS), a widely used measure, which contains a factor labeled "vigor/activity." The vigor factor has been negatively related to tension, depression, anger, fatigue, and confusion in construct studies. Thayer (1987a, 1987b) used a different adjective checklist in his studies of the mental repre-

sentation of energy and applied it to the study of diurnal rhythms, diet, and exercise. One of his variables, labeled "energy," made up of five adjectives (lively, energetic, active, vigorous, and full of pep), showed systematic relations with these variables. For instance, he showed that exercise (walking) resulted in increased short-term feelings of energy relative to snacking. Furthermore, Thayer found that positive energy ratings were associated with less negative appraisals of personal problems. Finally, Stewart et al. (1992) reviewed evidence from clinical literatures suggesting links between feelings of energy and a variety of health states, from sleep disturbance to somatic illnesses. They also developed a four-item scale assessing energy versus fatigue that loaded positively on a factor representing current general health. These researchers highlighted the methodological importance of distinguishing a positive sense of energy (the focus of the current research) and negative states associated with somatic symptoms or fatigue, and of assessing energy using items that are not confounded with concomitants such as depression, sleepiness, or other health-related concerns. In accord with this, the current studies utilize items pertaining only to subjective feelings of energy and aliveness per se, without reference either to fatigue or weakness as a state or variables that might influence energy variations, such as psychological or physical symptoms, feelings of alienation, goal directedness, or happiness.

This brief review suggests that vitality has emerged as an important idea within diverse theoretical frameworks, and that subjective energy has been successfully explored in some previous empirical work, particularly within the health literature. In the current article we attempt to build on these prior contributions and theoretical perspectives concerning vitality.

Although admittedly one cannot, in principle, directly measure the energy available to the self, in this research we explore vitality as a *subjective* variable. To do so we create a brief scale narrowly focused on positive feelings of energy and aliveness and examine its construct relations with other variables of theoretical interest. Our assumption is that subjective vitality is both experientially salient and meaningful, and that evidence will point to it as a phenomenal nexus upon which physical and psychological factors converge.

### Subjective Vitality: A Preliminary Theoretical Formulation

The term vitality has its etymological source in the very idea of life and is accordingly defined as an animating force, or principle of life. According to the *Oxford English Dictionary*, an individual with vitality has vigor and liveliness, a general energy for life. In colloquial use, vitality is typically employed to describe manifest excitement and energy and is applied to those who appear spirited, enthusiastic, and spontaneous.

The conceptual tie between vitality and life is at once broad and vague. In part this is because even within theoretical biology definitions of life itself remain controversial (Mayr, 1982; Rosenberg, 1985). Yet there is some consensus that the primary distinction between life and nonlife rests on the property of organization (Jacob, 1973; Jonas, 1966). Briefly, organization refers to the active tendency of organisms to elaborate and integrate functioning while preserving the whole. Such organizational processes proceed from individuals, characterized by Polanyi (1958) as "centers" of initiative and regulation. This spontaneous, inherent, active tendency to assimilate and integrate is thus a central or essential feature of individual life (Ryan, 1993) and provides a starting point for the current formulation.

This idea that living things represent centers of initiative and regulation has had a counterpart in human psychology in the postulate that people have a basic psychological need to experience themselves as effective origins of action. For example, White (1960) postulated a basic need for humans to feel competent, which he defined as "fitness or ability to carry on those transactions with the environment that result in its maintaining, growing and flourishing" (p. 100). deCharms (1968) later elaborated on White's formulation, arguing that humans have a primary psychological need to be an origin of action—to initiate and regulate their own behavior. Deci and Ryan (1985) argued that these fundamental needs to be competent and an origin are most clearly manifest in the phenomenon of *intrinsic motivation*. Intrinsic motivation refers to activity spawned by the pleasure of action, and it is exemplified in behaviors associated with curiosity, exploration, and experimentation with novelty. Intrinsically motivated activity should be accompanied by feelings of vitality, in that such activity represents a spontaneous expression of the organizational tendency of life (Ryan, 1995; Ryan, Kuhl, & Deci, in press). It is also a type of behavioral expression that wanes under conditions of external control, psychological conflict, or conditions associated with ineffectance. Accordingly, conditions conducive

to intrinsic motivation may also be those associated with a greater subjective sense of vitality.

More generally, we expect that the experience of vitality refers specifically to energy that is perceived to emanate from the self, i.e., it has, in attributional terms, an *internal perceived locus of causality* (Deci & Ryan, 1985). The perceived locus of causality (PLOC) construct derives from Heider (1958) and deCharms (1968). Heider distinguished *personal* from *impersonal causation*, the former referring to the perception that events or actions are under one's intentional control, and the latter to the perception that one's behavior or outcomes are not under intentional control. deCharms (1968) further distinguished between two types of personally caused, or intentional, actions and events: those that have an internal perceived locus of causality (IPLOC), in which one feels like an "origin," and those that have an external perceived locus of causality (EPLOC), in which one feels like a "pawn." Here we are arguing that, to the extent that one experiences one's energy as "one's own" and as emanating from the self (IPLOC), one will correspondingly report vitality. However, one might also "be" energized or activated by "impersonally caused" forces such as mood swings (as in bipolar disorder), or by external sources (such as a threatening boss) that we expect would not typically engender feelings of vitality. Furthermore, insofar as one feels most vital when being an origin rather than a pawn, then factors in one's physical, mental, or social contextual worlds that affect one's felt potential to organize and initiate action would be linked to this sense of subjective energy.

This formulation highlights the fact that subjective vitality, as proposed herein, is not a direct reflection of observable effort or caloric energy expenditure. One may expend energy on tasks that subjectively come from the self or on activities that one is compelled to do. A slave may be forced to build a stone tower, dragging stones from miles around. This tremendously effortful action is motivated and intentional, but would typically be experienced as draining vitality, since it detracts from one's ability to behave autonomously and in ways that actualize or enhance the self. On the other hand, a sculptor who performs the same act of hauling and carving stone as a creative endeavor might feel vitalized or invigorated by this activity, as it emanates from and expresses the self. Similarly, patients in a manic phase of a bipolar disorder do not typically report feeling "vital and alive," but rather report feeling exhaustively "driven" or compelled into flights of thought and activity, often accompanied by feelings of fatigue, irritation, and

agitation (American Psychiatric Association, 1994).<sup>1</sup> Subjective vitality does not, therefore, refer to just any energy, but rather to energy felt to be one's own.

Accordingly, we hypothesize that differences in subjective vitality should be closely associated with individual differences in self-actualization, which has been defined as "the discovery of the real self, and its expression and development" (Jones & Crandall, 1986, p. 63). People high in self-actualization experience their activities as autonomous and personally expressive (Waterman, 1993), and we expect that their sense of the origin and internal cause of their activities is associated with a high degree of subjective vitality. Conversely, depression, which is typically associated with anergia and amotivation and is accompanied by an impersonal or external perceived locus of causality in which one feels little control or agency (Ryan, Deci, & Grolnick, 1995), should be negatively associated with subjective vitality, as should signs of psychological conflict or overcontrol. In these latter cases, the perceived locus of control for experience and behavior lies outside the self, diminishing the felt energy available to the self.

*Vitality and somatic factors.* Subjective vitality is presumed to reflect an *organismic* state, and thus we assume that it is influenced by somatic as well as psychological factors. Physical conditions or pathologies that sap motivation and personal energy would, therefore, expectably be reflected in a diminished sense of vitality. For example, cancer patients often report decreased vitality following chemotherapy. Another example is pain, which is a psychological experience often accompanying physical trauma that interferes with attention, concentration, and motivation (Melzack & Wall, 1983). Pain is often perceived as an obstacle to agentic behavior, and thus usually should be associated with lowered subjective vitality. More generally, somatic symptoms, such as soreness, headaches, cold symptoms, and other "interferences" with optimal functioning, should relate to decreased levels of felt energy.

1. Although mania and subjective vitality may be distinct phenomena, during the early stages of a manic phase when one's rise in energy and elevated mood is still perceived as positive and manageable by the self, subjective vitality may also be high. Bipolar patients in this early phase of a manic swing may often be inspired, creative, and feel very active and alive. By contrast, at later stages, the level of experienced energy may be nonoptimal and experienced more as having an impersonal locus of causality, thus detracting from feelings of self-control, agency, and subjective vitality. We have no data to support these speculations regarding distinctions between mania and vitality.

Yet the relations between subjective vitality and somatic states may not be wholly straightforward, insofar as there are individual differences in the degree to which physical challenges are experienced as threats or obstacles to agency or effectance. Thus, even though vitality and physical factors may be strongly related in that one's energy and force of spirit are typically supported by healthy functioning, persons with comparable levels of disease or pain can vary considerably in their manifest energy and spirit (Kabat-Zinn, 1982). For example, a person who views a compromised physical state (e.g., chronic pain) as an overwhelming threat to the self will experience less vitality compared to a similarly compromised person who sees their circumstance as a challenge. In this view, a person with disabilities or illness can potentially possess more subjective vitality than a "healthy" athlete, in the sense of feeling more spirited and alive. Vitality is thus not expected to be a function of physical factors alone, but rather should also reflect the perceived meaning of physical factors with regard to the self.

### Overview of the Present Studies

The current studies examine the formulation of subjective vitality as an accessible phenomenal state reflecting the energy felt to be available to the self. Psychological and motivational factors expected to influence the felt availability of one's resources are also explored, as are a variety of somatic influences, reflecting our assumption that feelings of aliveness depend upon both psychosocial and physical supports. In initial studies we examine the predicted relations of subjective vitality to psychological attributes such as depression, anxiety, self-actualization, life satisfaction, and variables related to physical health and efficacy. We then compare the subjective vitality of adults in a pain treatment program with controls and look within the pain clinic patients for psychological variables associated with differences in vitality. In a further study we relate subjective vitality to the Big Five personality traits, social desirability, and positive and negative affectivity. We then study the relation between weight loss, motivation, and exercise, and subjective vitality in patients who completed an intensive weight-loss program.<sup>2</sup> Finally, the proximal influence of physical symptoms on vitality is assessed in a 2-week diary study.

2. Two of the studies presented here were made possible by collaborative arrangements with other investigators, and additional data provided by participants in these studies are published elsewhere, as follows: Study 1, Sample C, was recruited by Frederick and

It is important to note that our purpose in assessing subjective vitality in these studies is not to create a new personality measure, but rather to operationalize a narrow construct of scientific interest. Omnibus scales of activation, optimism, sensation seeking, extraversion, and hypomania exist elsewhere, and in some cases represent broader based personality constructs related to the issue of vitality (see, e.g., Study 3). However, we sought to restrict our empirical focus to self-reported feelings of aliveness and positive energy, since the nature and dynamics of this specific phenomenological state are the target of investigation.

### Study 1

In Study 1 we examined self-reports of vitality and their relations with a variety of constructs of theoretical interest in three samples. Self-ratings concerning energy and aliveness were used to form an ad hoc scale to operationalize subjective vitality. As hypothesized above, we expected strong relations between subjective vitality ratings and self-actualization, since the latter construct theoretically refers to the growth and expression of the self. Second, we predicted a negative relation between subjective vitality and an index of psychopathology, based on the widespread psychodynamic assumption that inner conflict and turmoil detract from subjectively available energy. Third, we examined vitality in relation to self-esteem. Self-esteem typically reflects both a positive valuation of self and a sense of confidence and agency, and therefore we expected it to correlate positively with subjective vitality. Fourth, we investigated the hypothesis that perceptions of healthy bodily functioning and physical self-efficacy are associated with enhanced subjective vitality.

In a second sample we also assessed additional constructs concerning psychological ill-being, including widely used indexes of depression and trait anxiety. Even though both could be conceived of as types of arousal, subjective vitality and anxiety were hypothesized to be negatively related, since anxiety is typically reflective of conflicts and obstacles to actualization. Depression, which is characterized by aner-

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Ryan (1993) for a study of motivation and exercise; Study 4 examines vitality within a sample of weight-loss patients followed by Williams, Grow, Freedman, Ryan, and Deci (1996) for a 2-year period in a study of motivational determinants of maintained behavior changes.

gia and loss of perceived agency, was expected to be inversely related to subjective vitality. Finally, we examined relations between vitality ratings and the Hopkins Symptom Checklist, which assesses various health symptoms associated with psychological factors, including somatization and concerns with control. We chose the Hopkins measure specifically because we hypothesized that issues concerning control, hopelessness, and worry, which can be manifest in somatic symptoms, also negatively impact the psychological sense of energy and aliveness reflected in our subjective vitality items.

To further extend the generalizability of these construct relations, vitality ratings were also examined within an adult sample (Sample C) recruited for a study of participation motives for sports and exercise (Frederick & Ryan, 1993). The relations of subjective vitality to self-reported anxiety, depression, self-actualization, and body functioning within this adult sample were expected to replicate the findings obtained with college students in Samples A and B.

## METHOD

### Participants

Two samples of university students completed questionnaires administered together in group settings run by trained research assistants. Sample A ( $N = 151$ ) consisted of 93 women and 58 men; Sample B ( $N = 190$ ) consisted of 68 men and 122 women. Sample C participants were 376 adults (242 women and 134 men) ranging in age from 18 to 75, with a mean age of 39. This sample was obtained through a mailing to 2,000 university and hospital employees randomly selected from a mailing directory. Surveys were sent in a one-time intramural mail distribution, with a return rate of 20.8%, which is well within the typical response rates for similar one-time survey methods (Weisberg & Bowen, 1977).

### Measures

*Subjective vitality.* Participants in Sample A rated 19 items concerning perceptions of having energy, zeal, interests, purposes in life, and feelings of aliveness on 7-point scales ranging from 1 (not at all true) to 7 (very true), in terms of how they "apply to you and your life at the present time." Two items were eliminated on the basis of descriptive statistics (poor variability), and 1 on the basis of further content considerations. Factor analysis of the remaining 16 items using an oblique (promax) rotation successfully identified a factor that exclusively concerned feelings of energy and aliveness. Specifically,

the analyses revealed two factors, the first (eigenvalue = 6.77, alpha = .84) containing seven energy-related items: (a) "I feel alive and vital"; (b) "I don't feel very energetic" (R); (c) "Sometimes I feel so alive I just want to burst"; (d) "I have energy and spirit"; (e) "I look forward to each new day"; (f) "I nearly always feel alert and awake"; and (g) "I feel energized." These items were seen as reflecting, from a content perspective, an adequate definition of a phenomenological sense of aliveness and energy, and thus were summed to create a variable labeled *subjective vitality*. A second factor consisted of six items primarily related to having interests, goals, and purposes (eigenvalue = 1.62), which will not be further considered.<sup>3</sup>

In samples B and C the seven vitality items were rated using the same instructions and 7-point Likert scale. Alphas for the scale were .84 and .86 for Samples B and C, respectively.

*Self-Actualization Scale.* The Self-Actualization Scale (SAS; Jones & Crandall, 1986) is a widely used 15-item, self-report questionnaire designed to measure self-actualization, or one's experienced development and expression of the self. Jones and Crandall report adequate test-retest and interitem reliabilities, as well as significant criterion and construct validities. Items are summed to create a total SAS score. The SAS was administered to Samples A, B, and C.

*Multidimensional Self-Esteem Inventory.* The Multidimensional Self-Esteem Inventory (MSEI; O'Brien & Epstein, 1987) is a 10-subscale measure of a number of discrete aspects of self-concept. We used the global and body functioning self-esteem subscales, each consisting of 10 items rated on 5-point Likert scales. The global self-esteem subscale taps generalized feelings of positive self-worth, whereas the body functioning self-esteem subscale concerns a narrower self-esteem component focused on perceived physical condition, agility, body comfort, and vigor. Alphas for both subscales are reported as .90. Both MSEI subscales were administered to Samples A, B, and C.

*RAND Health Insurance Mental Health Questionnaire.* The RAND Health Insurance Mental Health Questionnaire (RAND; Brook et al., 1979) consists

3. In this factor analysis, items pertaining to purpose and direction were included because motivation is typically conceptualized as energy *plus* direction (deCharms, 1968; Deci & Ryan, 1985), whereas our focus was on vitality as an energetic variable. In other factor-analytic work on vitality we have also written items pertaining to general feelings of pleasure, satisfaction, and enjoyment, which were also successfully discriminated as independent factors using an oblique rotation. Space considerations preclude presentation of all these analyses. Again, our purpose in such analyses is to empirically isolate vitality *per se* from closely related constructs like pleasure and purpose with which it is typically associated.

of 20 items tapping mental health for the "past month," rated on 5-point Likert scales. There are four subscales: personal well-being, anxiety, depression, and self-control, which vary between two and eight items. The RAND has shown appropriate correlations with other measures of mental health, as well as satisfactory discriminant validity. The total score represents the sum of the four factors (with personal well-being reversed); thus higher scores represent greater psychopathology. Test-retest reliabilities above .70 for the RAND total have been reported for both clinical and general adult samples. It was used in Samples A and B.

*Physical Self-Efficacy.* The Physical Self-Efficacy measure (PSE; Ryckman, Robbins, Thornton, & Cantrell, 1982) is a 22-item scale that assesses two components of physical self-concept; a 10-item perceived physical ability scale (PPA; e.g., "I have excellent reflexes"); and a 12-item physical self-presentation confidence scale (PSPC; e.g., "People think negative things about me because of my posture"). Participants rated items on 7-point Likert scales. Ryckman et al. report reliabilities exceeding .70 for both subscales, and concurrent validities. The PSE was used in Sample A only.

*The Hopkins Symptom Checklist.* The Hopkins Symptom Checklist (HSCL; Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974) is a 58-item, self-report measure containing five subscales tapping different expressions concerned with physical functioning: anxiety, depression, somaticism, locus of control, and internalization. Derogatis et al. report strong interitem and retest reliability, as well as construct validities for this measure. The HSCL was used only in Sample B.

*The Center for Epidemiological Studies-Depression Inventory.* The Center for Epidemiological Studies-Depression Inventory (CES-D; Radloff, 1977) is a 20-item measure. Items are endorsed using a 4-point Likert scale, with 1 = rarely and 4 = most of the time. Items are summed to obtain a global depression score. Cronbach alphas range from .84 to .85 for nonclinical samples, and test-retest reliabilities for clinical and nonclinical samples range from .48 to .67. The CES-D was used in Samples B and C only.

*The Taylor Manifest Anxiety Scale.* The Taylor Manifest Anxiety Scale (TMAS; Taylor, 1953) measures anxiety using 28 items, which participants rated on 7-point Likert scales. It was used in Samples B and C only.

## RESULTS

In all three samples hierarchical regressions were performed in which the variables of age and sex were entered first, followed by their interaction, to predict subjective vitality. No main effects were in evidence, nor was the interaction significant.<sup>4</sup>

As predicted, vitality ratings were significantly correlated with two positive indexes of well-being, namely self-actualization (Sample A,  $r = .50$ ; Sample B,  $r = .47$ ; Sample C,  $r = .45$ ) and global self-esteem (Sample A,  $r = .52$ ; Sample B,  $r = .55$ ; Sample C,  $r = .60$ ).

Subjective vitality also correlated negatively with various indexes of ill-being. The RAND, administered to Samples A and B, was strongly negatively related to reports of vitality (Sample A,  $r = -.60$ , Sample B,  $r = -.47$ ), indicating that greater psychopathology is associated with a lowered sense of personal energy. Similarly, relations between vitality and anxiety (TMAS) and depression (CES-D) in Samples B and C were also negative (TMAS,  $r_s = -.38$  and  $-.50$ , respectively; CES-D,  $r_s = -.44$  and  $-.60$ , respectively). Furthermore, subjective vitality was inversely related to psychological/somatic distress as evidenced in its associations within Sample B with the HSCL subscales of anxiety ( $r = -.29$ ), depression ( $r = -.40$ ), somaticism ( $r = -.36$ ), external locus of control ( $r = -.35$ ), and internalization ( $r = -.38$ ).

Finally, subjective vitality was correlated with body functioning self-esteem in all three samples ( $r_s = .47$ ,  $.48$ , and  $.51$  for Samples A, B, and C, respectively), and in Sample A with the PPA ( $r = .24$ ) and PSPC ( $r = .40$ ) subscales of the Physical Self-Efficacy Scale, providing evidence for the hypothesis that perceived physical competence is associated with enhanced feelings of energy and aliveness, as is confidence in one's physical appearance. Table 1 presents a summary of these correlational results.

### Study 2

In Study 1, moderate to strong correlations were found between ratings of vitality and self-actualization, mental health, and perceived physical functioning. In Study 2 we extend this research by examining the stability of subjective vitality ratings, attempting to replicate previous findings and looking at some new indexes of well-being and physical health.

4. Because we found no sex, age, or Sex  $\times$  Age effects in any of these studies we collapsed across these variables in analyses.

**Table 1**  
**Correlations of Subjective Vitality with Selected Constructs Used in Study 1 (Samples A, B, and C) and Study 4**

Construct	Sample A (college students) ( <i>n</i> = 151)	Sample B (college students) ( <i>n</i> = 190)	Sample C (Adults) ( <i>n</i> = 376)	Study 4 (pain clinic) ( <i>n</i> = 44)
Self-actualization	.50	.47	.45	.35
Global self-esteem	.52	.55	.60	.58
Body functioning self-esteem	.47	.48	.51	.46
RAND				
psychopathology	-.60	-.47	n/a	n/a
CES-D Depression	n/a	-.44	-.60	n/a
Taylor Anxiety	n/a	-.38	-.50	n/a

Note. All *ps* < .01, two-tailed. n/a = not administered. CES-D = Center for Epidemiological Studies-Depression Inventory.

To do so we surveyed 40 participants who had joined one of two activity groups (aerobics, Tae Kwon Do) concerning their vitality, well-being, and health "for the past month." These participants were surveyed twice, 8 weeks apart, to ensure no overlap in the target period being rated. It was expected that vitality ratings would show consistency over this relatively brief time span. In addition to measures of general mental health, the surveys also included a well-known measure of life satisfaction, the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985). Diener (1984) and colleagues have viewed life satisfaction as a subjective indicator of well-being and have shown its relations to a variety of factors. Because we view subjective vitality as also indicating well-being, we expected the two indexes to strongly relate. Study 2 also focused on relations between subjective vitality and somatic symptoms, this time using a checklist developed by Cohen and Hoberman (1983) designed to *exclude* symptoms of an obviously psychological nature. We assumed that the presence of physical symptoms would be a drain on the energy felt to be available to the self and thus would be associated with diminished subjective vitality. Finally, we included a measure of individual differences in self-determination (Sheldon & Deci, 1995) to extend our argument that perceived autonomy is associated with enhanced subjective vitality.

## METHOD

### Participants

Forty university employees and students (16 men, 24 women) from one of two noncredit activity programs (Tae Kwon Do, aerobics) participated. Participants' mean age was 21 (range, 18 to 24). They completed two survey packets, 8 weeks apart.

### Measures

Participants rated the seven vitality items for how they have felt over the "past month" so that the referent periods for the two testings would not overlap. Participants were also asked to rate themselves over the prior month on the following indexes: the RAND mental health subscales for anxiety, depression, and well-being (Brook et al., 1979) previously described, as well as a general health rating from the same measure; the Satisfaction with Life Scale (Diener et al., 1985), a widely used, five-item measure of well-being; and the Cohen-Hoberman Inventory of Physical Symptoms (CHIPS; Cohen & Hoberman, 1983), a 36-item checklist on which participants rate physical symptoms (e.g., nausea, headaches, stuffy nose) on 5-point scales. Finally, participants also completed the Self-Determination Scale (SDS; Sheldon & Deci, 1995), a recently developed measure consisting of 10 items tapping individual differences in perceptions of personal autonomy and integration. For each SDS item, participants read two statements and then rated which one was more true for them "in general" on a scale from 1 to 9. The SDS has two facets, Self-Contact (e.g., "I feel that I am rarely completely myself" vs. "I feel like I am always completely myself") and Choicefulness (e.g., "I am free to do what I decide to do" vs. "What I do is often not what I would choose to do"), each of which coheres internally and with the other (alphas > .85). The SDS has been used recently in published research (Sheldon, 1995; Sheldon, Ryan, & Reis, 1996).

## RESULTS

Correlations of subjective vitality ratings with health and mental health variables at two time points appear in Table 2. As shown, subjective vitality is associated with both better mental health and fewer physical symptoms at both time points, as well as with reports of higher self-determination. Average correlations between subjective vitality and target variables at each time point were calculated using the absolute values of each coefficient. An expected pattern was revealed in which there were stronger associations of vitality ratings with time-congruent (mean

$r = .61$ ) than with time-incongruent measures (mean  $r = .46$ ). Finally, the 8-week test-retest coefficient for subjective vitality ratings was  $.64$ .

### Study 3

A number of investigators have recently been interested in individual differences in the propensity to experience negative affect (NA) and positive affect (PA), and the relations between these affective predispositions and the neuropsychology of behavioral activation versus inhibition (e.g., Gray, 1990; Watson & Clark, 1993). People high in NA are not unable to experience excitement or enthusiasm, but instead have the tendency to focus on distress and upset and on avoiding negative outcomes, whereas persons high in PA tend more toward experiences of enthusiasm and joy and focus on approaching positive outcomes. Further, PA and NA appear to be independent rather than bipolar constructs (Watson & Clark, 1993).

Clearly we should expect that one's appraisal of current vitality, reflecting a positively toned experience of energy, will be related to individual differences in PA. We further expected that subjective vitality would be negatively associated with NA (rather than uncorrelated). We hypothesized this relation with NA, in part, because NA consists of feelings associated with states of arousal that are neither positive nor self-originated (e.g., jittery, hostile), as well as states associated with conflict and "internally controlling" (Ryan, 1982) events (e.g., guilt, shame) that are not only distinct from vitality, but may have a negative effect on it. Finally, we expected that both NA and PA would independently predict variations in subjective vitality.

These speculations regarding NA, PA, and subjective vitality received some preliminary support in a recent study of daily experience. Using a diary methodology, Sheldon et al. (1996) assessed twice-daily state ratings of subjective vitality using the seven items drawn from the current studies, and state ratings of positive and negative affect as assessed by Diener and Emmons's (1984) measure. Sheldon et al. (1996) found that state vitality ratings (controlling for averages) covaried with both positive and negative state affect ratings (controlling for averages), as did average vitality with average positive and negative affect. We expect a similar pattern to emerge in Study 3, using the Watson and Clark (1993) measure.

Study 3 also focused on the relations between subjective vitality and the Big Five (Costa & McCrae, 1985; Wiggins, 1996) personality traits.

**Table 2**  
 Correlations of Subjective Vitality (SV) with Indexes of Physical and Psychological Well-Being at Two Time Points: Study 2 ( $n = 40$ )

Index	Time 1		Time 2	
	SV <sub>1</sub>	SV <sub>2</sub>	SV <sub>1</sub>	SV <sub>2</sub>
RAND				
Anxiety	-.51	-.36	-.40	-.49
Depression	-.49	-.35	-.46	-.62
Well-Being	.75	.51	.62	.76
Health	.55	.37	.51	.51
Satisfaction with Life Scale	.52	.51	.42	.73
CHIPS (physical symptoms)	-.69	-.25	-.54	-.49
Self-Determination Scale	.62	.47	.61	.76

Note. All  $r_s > .33$  are significant at  $p < .05$ . RAND = the RAND Health Insurance Mental Health Questionnaire; CHIPS = the Cohen-Hoberman Inventory of Physical Symptoms; SV<sub>1</sub> = subjective vitality at Time 1; SV<sub>2</sub> = subjective vitality at Time 2.

Specifically, we expected subjective vitality to be associated with both Extraversion (positively) and Neuroticism (negatively). Extraversion is conceptualized as a basic personality trait characterized by outgoingness, activity, assertiveness, and positive affect. A moderate correlation with Extraversion was predicted because many items on the Extraversion scale connote a sense of personal energy and liveliness, whereas others simply connote high activity levels and social interests, without the implication of their being personally caused, self-actualizing, or characterized by positive energy. We expected Neuroticism to be negatively related to subjective vitality, since the conflicts and distress associated with neuroticism typically represent subjective energy drains (Levine, 1979; Shapiro, 1981).

Finally, we assessed the relations of vitality ratings with a well-known instrument tapping a tendency toward socially desirable response sets in order to help rule out the idea that a positive self-presentation accounts for the relations of vitality with well-being outcomes.

## METHOD

### Participants

Participants were 102 undergraduates (42 men and 60 women,  $M$  age = 21, range = 18 to 32) from a psychology course who completed surveys for an

extra-credit course option. Surveys were administered by a research assistant to small groups of approximately 20 students.

### Measures

Subjective vitality items were rated "as they apply to you and your life at the present time" on 9-point Likert scales, as in Study 1. The items yielded an alpha of .83 in this sample. Three additional measures were used: the NEO Personality Inventory (NEO-PI; Costa & McCrae, 1985), the Positive Affect/Negative Affect Scale (PANAS; Watson, Tellegen, & Clark, 1988), and the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1964). The NEO-PI measures basic personality traits of Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness. This version consisted of 181 items, rated on 5-point Likert scales. The PANAS assesses participants' experience of 10 positive and 10 negative moods, each rated on 9-point Likert scales. Separate positive and negative scores are computed by averaging the relevant items. Participants rated items for the extent to which they "generally feel this way, on the average." Finally, the Marlowe-Crowne Social Desirability Scale is a widely used and well-known measure assessing a response style reflecting positive self-presentation (or self-deception) with 33 items, each rated on a 5-point Likert scale.

### RESULTS

Correlations of subjective vitality, NEO-PI, and positive/negative affect variables appear in Table 3. Three Big Five traits were significantly associated with subjective vitality: Neuroticism ( $r = -.35$ ); Extraversion ( $r = .29$ ); and Conscientiousness ( $r = .24$ ). To examine the extent to which the Big Five account for the variance in vitality, a simultaneous regression procedure was run in which subjective vitality was regressed onto all five NEO-PI dimensions. The overall equation was significant,  $F(5, 97) = 4.18, p < .01$ , with the Big Five accounting for 20% of the variance in subjective vitality. Neuroticism was the only significant predictor of vitality within this regression analysis ( $B = -.31, p < .01$ ).

To further investigate the relations between Extraversion and subjective vitality, we examined both the facets and items on the long (48-item) version of the NEO Extraversion scale in relation to vitality scores. Two of the five facets, positive affect ( $r = .40, p < .01$ ) and warmth ( $r = .21, p < .05$ ), were significantly related to vitality ratings, and a third, activity, was marginally related ( $r = .19, p < .06$ ). The facets

**Table 3**  
**Correlations between the Big Five Personality Traits, Positive and Negative Affectivity, Social Desirability, and Subjective Vitality: Study 3 (n = 102)**

	Subjective vitality	Openness (O)	Conscientiousness (C)	Extraversion (E)	Agreeableness (A)	Neuroticism (N)	Positive affect (PA)	Negative affect (NA)
<b>Big Five</b>								
O	.04	—						
C	.24*	.03	—					
E	.29**	.33**	.37**	—				
A	.11	.18	.26*	.23*	—			
N	-.35**	.06	-.21*	-.34**	-.19*	—		
<b>PANAS</b>								
PA	.36**	.09	.33**	.51**	-.13	-.37**	—	
NA	-.30**	-.03**	-.13	-.26*	-.30**	.66**	-.24*	—
<b>Social Desirability</b>	.17	.01	.19*	.14	.37**	-.33**	.26*	-.27**

Note. PANAS = Positive Affect/Negative Affect Scale.

\* $p < .05$

\*\* $p < .01$ .

of gregariousness, assertiveness, and excitability were not associated with subjective vitality. We also looked at the correlations of Extraversion with the total scores on subjective vitality to determine what types of items were most closely related. Of the 48 Extraversion items, 9 were significantly correlated ( $r_s > .20$ ,  $p < .05$ ) with the total vitality score. Those items most closely associated with vitality were several items from the positive affect facet connoting a sense of oneself as having positive energy (e.g., "I am not a cheerful optimist" [R]; "I often feel as if I am bursting with energy"), and one from the activity facet ("I am a very active person"). By contrast, items that connote neither autonomy nor positive energy per se were simply unrelated to subjective vitality (e.g., "I really feel the need for other people if I am by myself for long"; "My life is fast-paced"; "I am not the kind of person who must always be busy with something" [R]). These examples illustrate how the NEO Extraversion dimension represents a much more broadband construct than our narrowly focused subjective vitality scale, which appears to reflect primarily the positive affect and liveliness aspects of Extraversion.

Positive affect (PA) and negative affect (NA) were each significantly related to vitality at moderate levels ( $r_s = .36$  and  $-.30$ , respectively). Watson et al. (1988) argue that PA and NA are independent dimensions. We therefore explored whether the interaction of PA and NA predicted vitality using a  $2 \times 2$  analysis of variance (ANOVA) based on median splits on the NA/PA dimensions. Results revealed main effects for PA,  $F(3, 98) = 5.50$ ,  $p < .05$ , and NA,  $F(3, 98) = 4.88$ ,  $p < .05$ , but no interaction,  $F(3, 98) = 0.14$ , *ns*. Inspection of cell means showed virtually no difference between those with high PA and high NA ( $M = 44.67$ ,  $sd = 12.46$ ) and those with low PA and low NA ( $M = 44.41$ ,  $sd = 7.9$ ), suggesting that both the presence of positive affect and the absence of negative affect contribute independently and approximately equally to resultant subjective vitality. Parallel regression procedures yielded similar effects.

Finally, it was found that subjective vitality ratings were unrelated to social desirability as measured by the Marlowe-Crowne Social Desirability Scale ( $r = .17$ , *ns*). Social desirability was related to the Big Five factors of Agreeableness, Conscientiousness, and Neuroticism, as well as to positive and negative affect scores, in expectable directions.

## DISCUSSION

Subjective vitality was expected to positively relate to Extraversion, a personality trait characterized by positive affect, outgoingness, and activity; and negatively to Neuroticism, in line with our earlier hypotheses regarding intrapsychic conflict and psychopathology. Results supported these hypotheses, showing relations of subjective vitality with Extraversion and with Neuroticism in predicted directions. Further analyses suggested that facets and items within the Extraversion scale that connote high, positively toned affect and energy were those most related to subjective vitality, whereas facets and items that conveyed neither agency nor positive energy (e.g., needing to be with others; being busy) were generally unrelated. These findings both suggest that one's ratings of current subjective vitality can be located within the framework of Big Five trait theory and support our view that subjective vitality specifically concerns positive feelings of aliveness and personal energy.

Individual differences in the tendency to experience positive and negative affect showed independent relations to self-reports of vitality. It appears that people feel more vitality when they have less negative mood and when they have more positive mood. These results extend recent findings by Sheldon et al. (1996), who found similar relations between vitality and positive and negative affect as assessed using Diener and Emmons's (1984) measure.

The results of Study 3 further suggest that vitality ratings are not being significantly influenced by either social desirability (or self-deception) as indexed by the Marlowe-Crowne Social Desirability Scale, or by one's propensity toward Agreeableness or Openness as indexed by the corresponding NEO-PI scales.

The generally moderate relations between subjective vitality and the trait constructs in this study may be only partially addressed by the content considerations detailed above. It is also noteworthy that vitality items were rated for how they applied to one's life at the present time, rather than how one is in general or on average. Accordingly, we have emphasized the pattern of relations, rather than their magnitude, in interpreting these findings.

### Study 4

Since subjective vitality is expected to be influenced by both mental and physical factors, we predicted that the experience of pain would

be a drain on felt energy and thus be associated with lower subjective vitality. We tested this hypothesis by comparing reports of vitality in a clinic population suffering from debilitating pain to those of a control group of same-age and same-sex adults randomly selected from Study 1, Sample C.

In addition, the relations of subjective vitality to measures of pain attitudes, motivation for treatment, and assessments of psychological symptomatology within the pain clinic sample were examined. Specifically, we expected that among pain clinic patients it would not be subjective pain per se, but rather the construal of pain as controlling one's life or as frightening that would be associated with lower vitality. We also predicted that patients indicating an external perceived locus of causality for treatment would evidence lower vitality, since that type of motivation is indicative of less sense of agency. As in the prior studies, we expected vitality to be positively associated with global and body functioning self-esteem. Finally, a subset of pain clinic patients completed the Profile of Mood States (POMS; McNair et al., 1971), a multiscale mood checklist tapping (a) anxiety, confusion, and anger/hostility, which are all types of arousal from which the positive energy of vitality should be distinguishable; (b) depression, which is often associated with depleted feelings of energy; and (c) vigor/activity and fatigue/inertia, two scales which, like our current ratings, are directly focused on felt energy. The vigor scale, like our current ratings, taps the experience of positive energy and thus should be most strongly associated with subjective vitality scores.

## METHOD

### Participants

Study 4 compared 44 adult participants (27 men and 17 women) in a pain rehabilitation program with 44 participants drawn from Study 2 representing randomized matches for age and sex (used as a control group). Pain clinic participants were in a program designed to help them cope with chronic pain and readjust to work situations. Pain clinic (and control) participants ranged in age from 23 to 59 ( $M = .38$ ).

### Procedure

Pain clinic participants completed the vitality items as part of a clinic entry packet, along with the measures of self-actualization, global self-esteem, and

body functioning self-esteem previously described. As in Study 1, participants rated vitality items "as they apply to you and your life at the present time."

### Measures

*Treatment Self-Regulation Questionnaire.* The Treatment Self-Regulation Questionnaire (TSRQ) was included in the clinic entry packet. Based on the self-regulation model developed by Ryan and Connell (1989), the TSRQ has been used recently in varied health settings (e.g., Ryan, Plant, & O'Malley, 1995; Williams et al., 1996). This survey method presents participants with items representing two categories of reasons for treatment participation: (a) external reasons (e.g., pressure from employers, doctors, or significant others) and (b) internal reasons (e.g., personal choice; desire to change). In this sample 10 external and 8 internal items were rated on 7-point Likert scales and summed to form total scores. Alphas for both subscales exceeded .70.

*Pain as Disabling Scale.* The Pain as Disabling Scale (PDS) was created for this study to assess the degree to which participants perceived pain as controlling or interfering with their life, and thus served as an index of impersonal causality (Deci & Ryan, 1985; Heider, 1958) with respect to their condition. The PDS contains four items rated on 5-point Likert scales from 1 (not at all) to 5 (very true) (e.g., "My disability controls my life"; "My pain prevents me from doing most things I want to do"). A principal components analysis revealed a single factor with all four items loading above .68. The alpha for these four items was .78.

In addition, a subset ( $n = 23$ ) of this pain clinic sample who were available on an additional survey date completed measures of pain and the POMS, a scale containing 65 adjectives describing feelings that are rated on 5-point Likert scales ranging from 0 (not at all) to 4 (extremely). For the pain measure, patients estimated on three separate 100-cm visual analog scales their average pain intensity and worst and least level of pain. On the same scale format they also rated one item tapping the degree to which they were frightened by pain. For the POMS, participants were asked to rate items for the "past month." Fifty-eight items form six mood dimensions: anger/hostility, confusion, tension/anxiety, vigor/activity, fatigue/inertia, and depression. The POMS has a long history of empirical use.

It should be noted that correlational analyses using this small subsample ( $n = 23$ ) may be insensitive to some meaningful effects because of low power.

## RESULTS

### Comparison of Vitality in Two Populations

A *t* test compared mean levels of vitality in the pain clinic versus control groups. As predicted, participants in the control group ( $M = 35.72$ ) reported significantly higher vitality than their pain clinic counterparts ( $M = 28.94$ ),  $t = 4.23$ ,  $p < .01$ .

### Relations between Subjective Vitality and Other Variables within the Pain Clinic Sample

As in previous samples, vitality was positively associated with global ( $r = .58$ ,  $p < .01$ ) and body functioning ( $r = .46$ ,  $p < .01$ ) self-esteem and self-actualization ( $r = .35$ ,  $p < .01$ ) among pain patients (Table 1). As predicted, vitality was negatively related to external reasons for seeking treatment as assessed by the TSRQ ( $r = -.37$ ,  $p < .01$ ), but was unrelated to internal reasons ( $r = .03$ , *ns*). Vitality was also negatively related to the PDS ( $r = -.45$ ,  $p < .01$ ), suggesting that the more disabling pain was perceived to be, the less one's vitality.

Of the subsample ( $n = 23$ ) of patients who completed additional pain ratings and the POMS, there were no significant relations between vitality and subjective ratings of least, worst, and average pain ( $r_s = -.17$ ,  $.17$ , and  $.26$ , respectively). However, vitality and pain fright were negatively associated ( $r = -.42$ ,  $p < .05$ ). Thus, within this sample it appears that it is not pain level per se that detracts from vitality, but the perceived disability (see PDS correlations above) and fear (pain fright) associated with it. Correlations between vitality ratings and the POMS were as follows: anger/hostility ( $r = -.20$ , *ns*); confusion ( $r = -.23$ , *ns*); tension/anxiety ( $r = .09$ , *ns*); vigor ( $r = .59$ ,  $p < .01$ ); fatigue ( $r = -.46$ ,  $p < .05$ ); and depression ( $r = -.44$ ,  $p < .05$ ). Vigor, as expected, was the mood dimension most closely related to the subjective vitality construct.

### Study 5

Results from prior studies suggested not only that somatic factors could directly influence subjective vitality (Studies 1, 2, and 4), but that treatment-related motivations also related to this target variable (Study 4). In Study 5 we pursued these points further in a study of patients who had been treated for morbid obesity. In a recent study of motivational factors affecting weight loss within a morbidly obese clinical sample, Williams

et al. (1996) followed patients who had entered a 26-week program for a 2-year follow-up period. For the purposes of the current article, we administered vitality items at the time of the 2-year follow-up so that we could examine their relations with motivational orientations and indexes of long-term weight loss and behavior change. We predicted that those who indicated more internal reasons on the TSRQ (see Study 4) for maintaining behavior changes acquired in the medically supervised weight-loss program would report higher vitality. The converse was predicted for external reasons. More important, we expected that patients evidencing greater weight-loss maintenance and relevant behavior change would be those reporting higher vitality.

## METHOD

### Participants

Fifty-eight participants were contacted as part of a 2-year follow-up of a weight-loss intervention (actual follow-up ranged from 20.4 to 25.9 months). Of these, 46 participants completed the vitality ratings, 6 of whom were not assessed for body weight. The resulting sample of 40 (31 of whom were women) had a mean age of 46.0 years.

### Measures

The TSRQ described in Study 4 was administered to assess participants' internal and external reasons for "continuing to follow the guidelines of the program." The TSRQ was abbreviated and modified in previous work within this clinic, and consisted of six items tapping external reasons ( $\alpha = .79$ ) for engaging in treatment and three tapping internal or autonomous reasons ( $\alpha = .58$ ). Exercise levels were measured using a three-item epidemiological assessment (Washburn, Adams, & Haile, 1987) in which respondents report their level of activity compared with others their age and sex, and the frequency of aerobic activities. Weight change was calculated in terms of change in Body Mass Index (BMI) from program entry to follow-up. The BMI is the most frequently used index of obesity, and represents body weight in kilograms divided by the square of one's height in meters. Morbid obesity is typically defined as a BMI > 39 (Williamson, 1993). Mean BMI at program onset was 41.0 ( $sd = 7.3$ ) and at follow-up was 35.0 ( $sd = 6.5$ ). Our interest was not in program success, however, but rather in the covariation of vitality at follow-up with BMI changes.

## RESULTS

The correlation between vitality and internal reasons for continuing to adhere to program guidelines was significant ( $r = .47, p < .01$ ). However, there was no association between vitality and external reasons ( $r = -.12, ns$ ) for adherence to behavior change.

A simple correlation between subjective vitality and the absolute change in BMI from program onset to follow-up was significant ( $r = .35, p < .05$ ). This relationship was further analyzed by regressing initial BMI onto follow-up BMI and then examining whether subjective vitality predicted the residual. This analysis was also significant ( $B = -.30, p < .05$ ). Finally, participants reporting higher exercise adherence at follow-up also reported greater subjective vitality ( $r = .41, p < .01$ ).

### Study 6

In several prior samples we found that ratings of common physical symptoms were negatively related to subjective vitality. However, the extent to which changes in symptoms are directly associated with changes in one's immediate subjective vitality remains unclear. The purpose of Study 6 was to further investigate the influence of common physical symptoms on subjective vitality using a diary method within a relatively healthy, asymptomatic sample of college students. Specifically, we hypothesized that state reports of vitality would covary with current physical symptoms, controlling for overall person means on both variables. That is, variations in symptoms should be associated with state variations in vitality within participants.

## METHOD

### Participants and Procedure

Participants were 97 undergraduates taking a psychology class who completed these surveys as part of extra-credit opportunities. Shortly after the midpoint of the semester, participants were asked to complete a twice-daily diary, once in the afternoon and once at day's end, for a total of 28 entries. Students recorded time of entry and what they were doing for the hour prior to entry, and were asked to note any deviations from procedure. Students were included in the study if they accurately completed 14 entries or more. The entire recording procedure took approximately 3 minutes per entry. Diaries were collected once per week.

## Measures

For each diary entry participants completed state versions of the seven vitality items (e.g., "At this moment, I feel alive and vital"; "I don't feel very energetic right now"), by following this instruction: "How true are each of the following statements for you *right now*?" They also completed a nine-item physical symptom checklist adapted from Pennebaker (1982) for "how much you have experienced *each* of these symptoms this afternoon (evening)." Participants rated the presence of symptoms (e.g., headaches, shortness of breath) on 7-point scales, which were summed to obtain a total symptom score. They also reported the specific activity they were engaged in and checked a category of activity type (e.g., work, recreation, self-maintenance), as well as any anomalies in their recording efforts, such as late entry. The activity-type categorizations revealed no meaningful pattern of relations with subjective vitality.

## RESULTS

### Preliminary Analyses

Vitality ratings ( $n = 2,557$  observations) were subjected to a principal components analysis that identified a single factor (eigenvalue = 4.91) with all seven items loading above .50, accounting for 70% of the variance ( $\alpha = .92$ ). Similar analyses were also accomplished on several randomly selected samples of daily entries ( $N = 97$ ), in order to replicate these results without using repeated measures from the same participant within a given analysis. These, too, yielded a similar one-factor structure for the seven subjective vitality items.

### Primary Analyses

Since we focused primarily on the covariation of state vitality with physical symptoms within participants, we sought to control for variance due to individual differences in both vitality and physical symptoms, so that we could obtain an estimate of their state-to-state relations. To accomplish this we calculated individual means on state vitality and physical symptom ratings across all 14 to 28 observations per participant. These means were then removed from each observation point using regression; i.e., participants' mean state vitality scores were regressed out of each diary entry vitality score; their mean symptom ratings were regressed out of each entry's symptom score (West & Hepworth, 1991). Two sets of correlations were obtained: one between

average state vitality and average symptom ratings ( $n = 97$ ); and a second between the state vitality and symptom ratings across all participants once mean level individual differences on each variable had been removed ( $n = 2,557$  observations).

The findings revealed that average state vitality was uncorrelated with average physical symptoms ( $r = -.05$ , *ns*) over the 2-week period of study. However, the residualized state vitality and total symptom variables (controlling for average scores) related as predicted ( $r = -.32$ ,  $p < .001$ ), indicating that variations in symptoms at the time of a given daily entry were related to variations in subjective vitality. Of individual symptoms, headaches ( $r = -.35$ ) were the strongest predictor of state vitality, with sore muscles, coldlike symptoms, stomachaches, and faintness being more moderate predictors ( $r$ s ranging from  $-.12$  to  $-.20$ , all  $ps < .001$ ). These results suggest that physical symptoms can be a drain on one's subjective vitality.

### GENERAL DISCUSSION

In this article we explored a variety of conditions and attributes associated with variations in subjective vitality. We conceptualized the experience of vitality as an accessible and salient phenomenal marker of one's "health of spirit," which we expected to be affected by both psychological and somatic factors. Subjective vitality was therefore expected to be related not only to the individual's experience of physical health and bodily functioning, but also to variables associated with a sense of agency, self-actualization, and personal well-being.

In grappling with psychological factors that may be associated with variations in subjective vitality, we drew on previous work in self-determination theory (Deci & Ryan, 1985, 1991). In this theory people are argued to be innately oriented to exercise and extend their capabilities, in the form of both intrinsic motivation and volitional activity. Factors that disrupt this organizational propensity or the associated sense of being an "origin" (deCharms, 1968) are not only hypothesized to interfere with motivation, but also to negatively affect general well-being (Ryan, 1995). Herein we hypothesize that subjective vitality is likewise a function of conditions that support agency and growth. In support of this general formulation, it was shown that subjective vitality is, in varied samples, associated with self-actualization, self-determination, mental health, and self-esteem. Conversely, indexes of intrapsychic distress were associated with less vitality. Also, partici-

pants reported greater vitality when they felt more self-motivated, and less vitality when they perceived themselves as controlled by external forces, as revealed by measures of treatment motivation in two settings.

We also examined how general feelings of vitality were associated with personality dispositions toward positive and negative affect and with the Big Five traits. We found, as did Sheldon et al. (1996), that subjective vitality related independently to both positive and negative affect in predicted directions, herein using a well-known measure developed by Watson et al. (1988). Regarding the Big Five, significant relations of subjective vitality with Extraversion, Neuroticism, and Conscientiousness were found. We explored in detail the nature of the relations between subjective vitality and Extraversion, a personality trait that in some senses is definitionally encompassing of our narrower construct. Extraversion, as operationalized in the NEO-PI, showed itself to be more broadband than subjective vitality—the latter relating most strongly to those aspects of Extraversion concerning positive affect and energy. Extraversion items concerning being busy or fast-paced, needing social contact, or being excitable were typically unrelated to vitality. It thus appears that subjective vitality, which we believe represents a specific psychological state, can nonetheless be meaningfully located within the fundamental framework of traits represented by the Big Five.

The current studies also showed that subjective vitality was significantly related to somatic issues and reactions to physical concerns. Thus vitality was rated higher by participants reporting better body functioning and physical self-efficacy and fewer physical symptoms. Subjective vitality was also lower for pain clinic patients compared to controls, and was particularly low in patients for whom pain represented a disabling or frightening event. Further, patients treated for morbid obesity who followed program guidelines, exercised more, and achieved better maintenance of weight loss, reported higher vitality than those who were less adherent, active, and successful at weight loss. Finally, diary ratings of state vitality were shown to systematically covary with the presence of common physical symptoms. Overall, then, it appears that subjective vitality is a phenomenon that may be influenced by physical health states and symptoms. However, it is important to note that none of these studies directly tests the potential causal or mediational role that subjective vitality might play in physical and mental health processes. Rather, the reliable tie between subjective vitality and perceived somatic functioning, symptoms, and psychologi-

cal health states, as evidenced in these studies across a variety of measures, suggests that feelings of energy and aliveness may be useful in applied research as one marker of well-being.

Subjective vitality ratings, then, appear to be related to both psychological and physical well-being. Among the advantages of using subjective vitality ratings as one index of well-being is that they pertain to a readily accessible feeling state and yet are free in content of references to expected concomitants or manifestations of having energy. However, evidence from these studies does not confirm or address whether high vitality is always indicative of well-being. That is, evidence linking high subjective vitality with well-being does not preclude the possibility that there are other subjective states that are not characterized by high energy (e.g., serenity, peace, contentment) that may, nonetheless, be systematically associated with well-being. In addition, our subjective vitality items were written to narrowly reflect a positive feeling of having personal energy. Clearly there are many states in which one experiences high energy that are not associated with the positively toned feeling of vitality, and are probably also not associated with greater well-being. Such states might include mania, anger, hostility, and anxious agitation. Although this point was not extensively explored in the current work, we did show that anger, anxiety, jitteriness, and other energy-related affects that are not associated with positivity or with being an "origin" are also not associated with higher subjective vitality. We also suggested that the phenomenology of mania does not correspond to subjective vitality as we conceptualize it, but provided no empirical support for that speculation.

Among prospects for future study would be further assessments of factors that facilitate versus forestall subjective vitality. Self-determination theory (Deci & Ryan, 1991; Ryan, 1995) suggests that contexts that support psychological autonomy, competence, and relatedness should enhance vitality, whereas those associated with perceptions of being controlled, incompetent, or unloved should diminish vitality. Partial support for this broad formulation has been emerging in several recent studies where subjective vitality has been used as a dependent variable. Grow and Ryan (1996) recently studied elderly persons in a nursing facility and found that measures of greater autonomy and higher quality relationships were both predictive of greater subjective vitality. Also, as in the nonelderly samples reported herein, subjective vitality was related negatively with depression and anxiety and positively with physical health, psychological well-being, and life satisfac-

tion. In several settings, Kasser and Ryan (1993, 1996) have shown that persons who strongly aspire to extrinsic outcomes such as money, fame, and attractiveness, as opposed to intrinsic outcomes such as personal growth, community, and affiliation, report less vitality. Further, in a short-term longitudinal study, Sheldon and Kasser (1995) found that personal strivings (Emmons, 1986) that were accompanied by an external perceived locus of causality (i.e., lower perceived autonomy) were predictive of lower subjective vitality. Finally, in a recent diary-based study of daily experience, Sheldon et al. (1996) assessed state ratings of subjective vitality and fluctuations in psychological need satisfaction. They found relations between both trait and state ratings (controlling for traits) of competence and autonomy with average and state (controlling for average) subjective vitality, as would be expected from the current formulation. These findings lend support to our conceptualization of subjective vitality as a feeling of personal energy associated with agency, which can be diminished by factors that block or hinder autonomy or competence. In current research we are also exploring how vitality corresponds with feelings of relatedness or connection with others, to further examine the nature of what feels vitalizing and enlivening to individuals. Such research may potentially aid our understanding of how well-being can be affected by social contexts and the strivings of people within them (see also Diener, 1984; Waterman, 1993).

Beyond examining how subjective vitality may be affected by social contextual factors, future research might also focus on whether experienced vitality may be more than a marker of health states, as the current studies suggest, and actually mediate health-related processes. It is plausible to think that people high in subjective vitality may be more able to mobilize their resources to stave off disease processes or to more actively participate in health-relevant activities than those lacking vitality. Subjective vitality could also be examined in longitudinal research for its contributions to resilience, e.g., its potential as a buffer to stress and disease and its ties to immunological status. The relations of subjective vitality to neuropsychological systems is also potentially fruitful, especially given the association found in the current results between subjective energy and variables related to positive mood (Watson & Clark, 1993), a dimension that is increasingly being linked to neuroanatomically specific behavioral activation systems (Gray, 1990). Generally, the relations between subjective vitality and

organismic processes related to health and disease largely remain to be explored. Future studies using objective indicators of physical or mental status rather than self-reports would help to clarify these relations.

A central feature of subjective vitality is its conceptual relationship to organismic wellness. Clinical literatures have traditionally focused on well-being as the absence of pathology (Cicchetti, 1991; Cowen, 1991, 1994), and thus positive indicators of wellness are less pervasive. Furthermore, as Diener (1984) and Ryff (1995) have argued, theory-driven models of well-being are as important as theory-driven models of pathology, but relatively speaking, the former are scarce. In the current article, subjective vitality is explored both empirically and theoretically and is shown to relate to both psychological well-being and physical health, which not only subserves psychological well-being but is itself an aspect of personal experience. Insofar as generations of thinkers have assumed that health and spirit are inexorably intertwined, then further study of subjective vitality may allow us to better comprehend some of the fundamental, albeit enigmatic, issues concerning the dynamics of energy and well-being as they affect individuals in their everyday social contexts.

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