

Psychological well-being and health. Contributions of positive psychology

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ABSTRACT

Positive Psychology is contributing to a more precise definition of the outline of human well-being and is fully incorporating studies on positive elements (strengths and positive emotions) that are without doubt amplifying the framework of research and conduct of psychology, in particular that of Clinical Psychology and Health Psychology. Over the last few years, academic debate has, from a scientific perspective, gone back to two ancient philosophical orientations, namely hedonism and eudaimonia. The hedonic approach conceives well-being as the presence of positive affect and lack of negative affect, whilst the eudaimonic perspective regards well-being as the consequence of a full psychological actualization from which people develop their whole potential. Whether assessed from a hedonic or eudaimonic perspective, well-being seems to play a role in the prevention of and in the recovery of physical conditions and diseases and so possibly contributes to an increase in life expectancy. Finally, the implications of these findings are discussed both from an academic perspective and, more generally speaking, from a social and political point of view.

Key words: health, well-being, hedonism, eudaimonia, positive affect

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INTRODUCTION

Positive health and negative health. The perspective of positive psychology

Este This article, published by a journal which has long dealt with clinical and health psychology, makes it possible to explain the contribution of positive psychology to the fields of positive health and negative health, which we believe to be enormous. Firstly, this vision of psychology allows for a more accurate definition of the outlines of human well-being. Furthermore, it is fully incorporating the study of positive elements such as strengths and positive emotions which, without any doubt, are widening the research and action frameworks of psychology in general (Vázquez & Hervás, 2008) and in particular as we attempt to concisely show in this paper, that of Clinical Psychology and Health Psychology.

The effort to understand well-being and its causes is not new but it is an issue that throughout history has always raised interest (McMahon, 2006).

In some sense, all medical and psychological interventions, as well as political, social and economic ones, aim at increasing people's quality of life as one of their main objectives (Vázquez, 2009b).

As a matter of fact, we make many of our everyday decisions by weighing up the degree of happiness to be reached by us ourselves or by our loved ones (Gilbert, 2006).

However, due to reasons related to the sociology of science and with the professional development of scientific disciplines, the focus of intervention for health related areas has historically more often been on the reduction of pain, suffering and deficiencies rather than on the development of individual and collective abilities (Vázquez, 2009a). In the field of psychology, the emphasis on positive psychological states taken as factors protective of physical and mental health, and especially the relation that exists between these positive psychological states and its repercussions on the development of illnesses has only started to be studied over the last two decades (Taylor, Kemeny, Reed, Bower & Gruenewald, 2000). Except for some rare attempts such as the one by Jahoda (1958), positive theories and models are generally recent (Deci & Ryan, 2000; Keyes & Waterman, 2003; Ryff, 1989; Ryff & Keyes, 1995; Seligman, 2002), especially if we compare them with the long historical development of the models explaining mental disorders.

As recently stated by Salanova (2008), a brief review of the scientific literature published over the last one hundred years (from 1907 to 2007) shows

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the publication of 77,614 articles on *stress*, 44,667 on *depression*, and 24,814 on *anxiety*, but only 6,434 on *well-being*. In this large and full production, the number of studies on *happiness* (1,159 papers) and on *enjoyment* (304 papers) is almost symbolic.

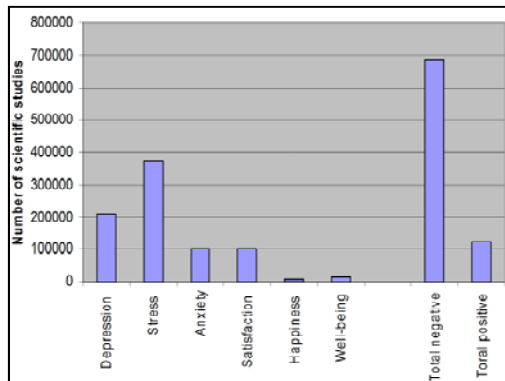


Figure 1. Summary of the number of scientific studies (until 14 May 2009) associated with negative and positive mood published by PubMed. (Terms used: *depression, stress, anxiety, satisfaction, happiness, well-being*)

Something similar happens in the field of medicine. In spite of the fact that medicine is supposed to deal both with health and illness, a review of the published medical articles on depression, stress or anxiety shows a 6:1 ratio as compared to those on satisfaction, happiness or well-being (See Figure 1). And if we focus on specific studies analyzing the relationship between mood and physiological symptoms, the studies on negative mood such as depression or anger, among others, are twenty times more frequent than the studies dealing with positive emotional states (Pressman & Cohen, 2005).

In spite of this panorama, the traditional attention towards symptoms and diseases is gradually changing into an increasingly wider concept of health that includes aspects of personal optimal performance and not only the absence of diseases. As detailed elsewhere (Hervás, Sánchez, & Vázquez, 2008), this more positive conception of health was made explicit in the initial set-up of the World Health Organization, which, at the end of the Second World War stated in the Preamble of its First Articles of Association.

“Health is a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity.” (WHO, 1948)

A few years later, following a proposal from the WHO, the World Federation for Mental Health defined ‘health’ in 1962 as “The best possible state within the existing conditions.” Similarly, the final declaration of the first WHO International Conference on Health promotion, held in Ottawa in 1986, stated that:

“In order to reach a state of complete physical, mental and social well-being, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment. Health is, therefore, seen as a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities.”

(Ottawa Charter for Health Promotion. WHO, Geneva, 1986)

More recently, in a praiseworthy effort by the Scottish government to incorporate elements of positive psychology into their prevention and intervention health plans, mental health was defined as (Myers, McCollam, & Woodhouse, 2005):

“The emotional and spiritual resilience which allows us to enjoy life and to survive pain, disappointment and sadness. It is a positive sense of well-being and an underlying belief in our own and others’ dignity and worth.”

The 1948 definition by the WHO was visionary but maybe utopian as well (Vázquez, 1990), since at that time adequate measuring instruments were not available to professionals or citizens aware of and committed to this refreshing approach towards the concepts of health and illness.

In this regard, one of our most urgent challenges is to put the concept of positive health into operation at various levels (individual-community, physical-mental, etc). The incorporation of indicators of positive health into the design of prevention and intervention programs is most important and is bringing about a decisive change of outlook. In order to analyze mental health, in addition to morbidity criteria (such as the prevalence of people with mental disorders, suicidal cases, hospital beds available, etc.), indicators of positive health can also be used. In this sense, it is important to appreciate, for example, the attempt to include positive indicators (such as the vitality item taken from the SF-30 performance scale) in the mental health plan of the Spanish Ministry of Health (*Estrategia en Salud Mental del Sistema Nacional de Salud*, 2007).

In the research field about indicators of positive health, the WHO itself has made a considerable effort to make the concept of life quality operative and develop instruments that facilitate accurate measurement (WHOQOL Group, 1994). Coming from the field of psychology, and especially, but not only, from the movement of positive psychology (Seligman & Csikszentmihalyi, 2000), there is a growing number of instruments oriented towards measuring aspects related to well-being, such as satisfaction with life, emotional well-being, psychological strengths or positive emotions (Deaton, 2008; Diener, 2009; Ong & Van Dulmen, 2007).

In addition to providing a wider definition of health and incorporating the study of positive factors associated to health and well-being, the last two decades have started to reveal that positive psychological states are not only an integral part of health, but also that they can actually influence the onset of illnesses and physical problems as well as the recovery processes. The self-perception of healthy people, characterized by having positive feelings about themselves, a feeling of self control and an optimistic vision of the future, provides reserves of and a driving force for resources not only to cope with everyday difficulties but also with those which are especially stressful and even threatening for one’s existence (Taylor *et al.*, 2000). Having a good physical or mental state should not only consist in not having an illness or disorder, but also in enjoying a series of resources or abilities that allow for coping with adversities (Almedom & Glandon, 2007). And,

what is even more important from the perspective of positive health, that very state of well-being is going to make it possible to achieve a greater psychological, social and community development (Fredrickson, 2009).

Positive psychological factors may have such a strong relationship with health as negative ones. As for the latter, a great amount of data has accumulated over the years. For example, negative expectations are associated not only with a quicker progression towards death in patients diagnosed with AIDS, but also to a faster onset of symptoms in those patients who had previously been asymptomatic (Taylor *et al.*, 2000). But at the same time new studies have shown that the ability to keep being optimistic, however unrealistic it may be (Reed, Kemeny, Taylor & Visscher, 1999; Reed, Kemeny, Taylor, Wang & Visscher, 1994; Taylor *et al.*, 1992) and the ability to find meaning in face of adversity (Bower, Kemeny, Taylor & Fahey, 1998) seem to be physical health protective factors.

Observers of the human condition have long held that positive states of mind may lead not only to a more profound sense of life but also to a healthier existence. The development of rigorous methodological procedures, including longitudinal studies, adequate measuring instruments and the necessary mechanisms to control biological and psychosocial influences, make it possible nowadays to empirically demonstrate the validity of these ideas (Taylor *et al.*, 2000).

Components of well-being: Hedonism and eudaimonia

The popular definition of health from the WHO makes the idea of positive health turn around the concept of well-being. In spite of this, it might be interesting to consider what scientific psychology can contribute to the definition of well-being. Over the last few years there has been an emergence of interest and studies on well-being (Vázquez & Hervás, 2009) and important concepts and measures have been developed to delineate the concept of positive health.

Although from a subjective perspective it is relatively easy to identify one's own degree of well-being or happiness, reaching more general findings from a more rigorous approach has proved to be a more complex task (Ryan & Deci, 2001). Over the last few years, academic debate, from scientific perspectives, has returned to two old philosophical orientations. The first of these perspectives has generally been called *hedonism* (Kahneman *et al.*, 1999) which defines well-being as the presence of positive affect and the absence of negative affect. The second perspective, both as ancient and modern as the hedonic perspective, suggests that well-being does not consist in maximizing positive experiences and minimizing negative ones (Ryan & Deci, 2001) but refers to living fully or to allow for the richest human potential possible (Ryan, Huta & Deci, 2008). This second perspective is widely known as *eudaimonia*.

Hedonism has its roots in Greek philosophers and Epicurus is probably its principal exponent (McMahon, 2006). The basic idea is that the objective of life is to experience the greatest possible amount of pleasure (although oriented

towards enjoyment and noble activities). Happiness would be, in some sense, the sum of pleasurable moments. Hedonic philosophy has had its continuation in philosophers such as Hobbes and Sade or in the utilitarian philosophers, whose ideas provided the foundations for the new economy of the 18th century. In the field of modern psychology, the predominant concept stemming from hedonic psychologists is *subjective well-being*. Subjective well-being usually includes two elements, namely *affective balance*, which is obtained by subtracting the frequency of negative emotions from the frequency of positive emotions, and, secondly, *perceived life satisfaction*, which is more stable and has a greater cognitive component (Lucas, Diener & Suh, 1996). Even though affective balance and life satisfaction imply different time frameworks for subjective well-being, as life satisfaction is a global judgement on life itself, whereas affective balance makes reference to the relative frequency of pleasant or unpleasant affects in one's immediate experience (Keyes, Shmotkin & Ryff, 2002), they can be understood as concepts linked to an hedonic perspective (Vázquez, 2009a).

	Hedonic well-being	Eudaimonic well-being
Representative authors	Epicurus, Hobbes, Sade, Bentham, Bradburn, Tennen, D. Watson, Kahneman	Aristotle, Frankl, Ryff, Deci, Seligman
Basic concepts	Pleasure Positive/negative affect Affective balance Positive emotions Net affect Life satisfaction	Virtues Self- fulfillment Psychological growth Aims and needs Psychological strengths
Characteristic measurements (Examples)	SWLS PANAS Sampling of emotional moments	PWBS VIA

Table 1. Authors, concepts and basic measurements of the hedonic and eudaimonic approaches to psychological well-being.

SWLS : Satisfaction with Life Scale (Diener *et al.*, 1985)

PANAS: Positive and Negative Affect Schedule (Watson *et al.*, 1988)

PWBS: Psychological Well-being Scale (Ryff, 1989)

VIA: Values in Action Inventory of Strengths (Peterson & Seligman, 2003)

In spite of the dissemination and wide use of this conception of well-being, other researchers have emphasized a different perspective, usually called eudaimonic well-being. (See some differentiating characteristics of both perspectives in Table 1). In his *Ethics to Nicomachus*, Aristotle urges men to live according to their *daimon*, that is, the ideal or perfection criteria that one hopes for and gives sense to one's life. All the efforts to live in accordance with that *daimon* and to fulfil and reach one's full potential are thought to give rise to an optimal state, namely eudaimonia (Avia & Vázquez, 1998). The eudaimonic conception establishes that well-being lies in the performance of actions coherent with deep values that imply a full commitment with which people feel alive and real (Waterman, 1993).

However, it might be appropriate to consider whether the eudaimonic perspective of human well-being can be assessed or it is a rather rhetorical element to measure. Carol Ryff, one of the most important authors within the eudaimonic approach, has argued that measurements for well-being have historically suffered from a lack of a theoretical basis and have forgotten important issues of positive functioning. By proposing the term *psychological well-being* to distinguish the concept from that of *subjective well-being*, which is more typical of the hedonistic conception, Carol Ryff has tried to overcome such limits and defines well-being as the development of a person's real potential (Ryff, 1989, 1995). In this way, happiness or psychological well-being is not the main motivation of a person but rather the result of a well-lived life (Ryff & Keyes, 1995; Ryff & Singer, 1998).

Ryff's proposal consists in a multidimensional model of psychological well-being linked to a questionnaire for measuring it (Ryff, 1995) which represents six different aspects of optimal well-being at a psychological level. Each dimension of psychological well-being posits a different challenge that people find in their efforts to function positively (Keyes, Shmotkin, & Ryff, 2002; Ryff & Keyes, 1995). In this way, those people who manifest eudaimonic well-being are characterized as follows:

- a) They have a positive self-regard that includes awareness of personal limitations (Self-acceptance).
- b) They have developed and kept warm ties with others (Positive relations with others).
- c) They create a surrounding context so as to satisfy their needs and desires (Environmental mastery).
- d) They have developed a strong sense of individuality and personal freedom (Autonomy).
- e) They have a sense of direction in life that unifies their efforts and challenges (Purpose in life).
- f) They have a dynamic of life-long learning and of continuous development of their abilities (Personal growth).

Similarly, the *Self-Determination Theory* (Ryan & Deci, 2000) also links the ideas of eudaimonia and self-realization as central aspects in the definition of well-being. This theory is based on one of the basic premises of humanism, which holds that well-being is mainly a consequence of optimal psychological functioning. The self-determination theory states that healthy psychological functioning implies adequate satisfaction of all three basic psychological needs, namely autonomy, competence and relatedness, as well as a system of congruent and coherent goals (Deci & Ryan, 2000). The first element, satisfaction of basic needs, consists in keeping a life balance that guarantees an adequate level of satisfaction in each one of the areas independently. As for the second component, the model argues that in order to develop eudaimonic well-being, each person needs to establish their personal goals, if possible, following some criteria. For example, the goals should be intrinsic rather than extrinsic, coherent to one another and, finally, coherent with their own values and interests, as well as with their basic psychological needs (Vázquez & Hervás, 2008).

As we can see, the basic psychological

needs proposed by this theory almost coincide with three of the dimensions in Ryff's model, namely autonomy, environmental mastery and sense of being connected to others, in spite of there being conceptual differences between the two models (Lent, 2003).

In addition to this, according to the self-determination theory, satisfying basic psychological needs enhances both subjective well-being and eudaimonic well-being (Ryan & Deci, 2001). According to these authors, this fact closes the debate on an alleged antithesis between both types of well-being, namely hedonic versus eudaimonic (Ryan, Huta & Deci, 2008). In this sense, both can be regarded as different 'paths to happiness' (Seligman, 2003); the eudaimonic conception focuses on the content of one's life and on the processes implied in living well, whereas the hedonic conception focuses on a specific result, to be precise, on achieving the presence of positive affects and the absence of negative affects, as well as a holistic feeling of satisfaction with one's life.

Nevertheless, the definition and measurement of well-being, either hedonic or eudaimonic, is still at its outset. In spite of the increasing progress in eudaimonic research and the important theoretical and practical contributions that the study of well-being implies, there are authors who doubt whether it is possible to transfer into psychology those concepts linked to the eudaimonic philosophical approach (Biswas-Diener, Kashdan, & King, 2009).

However, in spite of its complexity, we believe that the path that has been opened is really fertile and is demonstrating an increasingly convergent validity. For example, psychological well-being is also linked to research related to the brain and the so-called affective neuroscience (Davidson, 2003, 2004). High levels of hedonic or eudaimonic psychological well-being seem to be associated to an asymmetric activity of the prefrontal cortex—for example, higher activation on the left prefrontal side than on the right one—(Urry *et al.*, 2004). It is worth noting that, in this study, eudaimonic well-being revealed a link with asymmetry in the electroencephalogram which was maintained after statistically controlling for the role of hedonic well-being. This was not the case in the opposite direction, as hedonic well-being was no longer significantly associated with the asymmetric brain pattern after the influence of eudaimonic well-being had been adjusted. In another study using functional magnetic resonance, van Reekum and her collaborators (2007) showed that, in face of adverse stimuli, people with greater eudaimonic well-being had slower responses and a lower activation of the amygdala, as well as higher activation of the ventral anterior cingulate cortex. The latter finding suggests that some parts of the brain can be activated in order to minimize the impact of negative stimuli and, in this sense, it also suggests the existence of a possible mechanism by which eudaimonic well-being might be preserving and promoting hedonic well-being.

Health and hedonic well-being

The last decade has witnessed an explosion of scientific studies which have found specific

associations between the level of positive emotions and multiple physiological systems and health levels, both in perceived health and objectively measured health parameters.

An interesting prior question is whether positive affect and negative affect are two poles of the same continuum or on the contrary are two different dimensions independent from each other. If both were a part of the same continuum, the presence of positive affect would indicate the absence of negative affect. Furthermore, if this were the case, it would not make any sense to study the beneficial effects of positive emotions on health as it would be enough to turn to published studies that systematically relate the high presence of negative emotions with the propensity to develop certain illnesses (Booth-Kewley & Friedman, 1987; Herbert & Cohen, 1993). But if, on the contrary, positive affect and negative affect were two relatively independent dimensions (Bradburn, 1969), as has been demonstrated on numerous occasions (Vázquez, 2000a), then it would be appropriate and interesting to study the specific benefits that the presence of positive affect may contribute to health.

The relationship between negative affect and health has been widely studied from the field of psychoneuroimmunology. Some of these studies have found that distressed or depressed people show a worse immune response to vaccines. For example, in a recent study which included the human papillomavirus vaccine (HPV) (Fang *et al.*, 2008), it was found that out of the women who had been vaccinated, those who manifested higher stress levels showed a weaker immune response to HPV. People with higher negative emotionality are also more vulnerable to infection and more prone to latent virus reactivation in their systems (Glaser & Kiecolt-Glaser, 2005). Furthermore, it has been found that negative emotional states increase the production of pro-inflammatory cytokines (Kiecolt-Glaser *et al.*, 2003; Lutgendorf *et al.*, 1999), such as interleukin 6 (IL-6), which has been related to various age-related diseases, such as cardiovascular diseases, type 2 diabetes, arthritis, osteoporosis, Alzheimer's disease, periodontal diseases and some types of cancer (Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002).

All these findings seem to indicate that negative emotions may weaken the response of the immune system. Now the question is whether this system can be boosted by positive emotions. One of the most powerful studies that have attempted to answer this question was led by Cohen, Alper, Doyle, Treanor and Turner (2006). Specifically, these authors measured the participants' positive and negative affective styles together with other social and demographic variables. Next, participants in the study were inoculated with the Rhinovirus or with the Influenza virus and observed during a quarantine period of 5 or 6 days, depending on the type of virus. Positive affect was associated with lower rates of illness. Specifically, the participants who reported higher positive emotionality had three times less probability to develop an upper respiratory tract disease after the effects of other variables such as type of virus, body mass, age, educational level, the season or negative emotionality had been controlled. Still more relevant, in absolute terms, is that the

degree of association between positive affect and illness rates was greater than that shown between negative affect and illness rates. Furthermore, when both variables were simultaneously used as predictors, negative affect lost its ability to predict illness. Even though this study is worth drawing attention to, due to its experimental design and accurate controls, it is not at all unique. Various studies have shown that positive affect might be related to better health and longevity. For example, in a two year long prospective study conducted with over two thousand 65-99 year old participants, Ostir, Markides, Black and Goodwin (2000) showed that the presence of positive affect or emotional well-being has an impact different from that of absence of depression or negative affect, and that, it is precisely positive affect that seems to protect individuals from physical deterioration due to age, and to positively affect their emotional independence and life expectancy. These same researchers have also demonstrated the relationship between positive affect and the lower risk of myocardial infarction (after a 3-year follow-up) and stroke (after six years) (Ostir, Markides, Peek, & Goodwin, 2001).

The well-known *Nun Study* by Danner, Snowdon, and Friesen (2001), carried out with nuns, found evidence that when positive affect was evident at around the age of 20, it could predict higher life expectancy 60 years later. This study showed a strong association between the positive emotional content in short autobiographical stories, written when entering the religious congregation, and the longevity assessed six decades later, when the participants were between 75 and 95 years old. To be precise, the nuns who had expressed more positive content in these texts lived an average of 6.9 years longer than those who had expressed less positive emotionality.

The studies by the group lead by Andrew Steptoe are relevant in this regard. These researchers have found that positive affect, measured by the total of well-being moments over the working day of the participants (middle-aged women), was associated to lower cortisol in the saliva, lower heart rate, lower systolic pressure and lower stress-related fibrinogenous response (Steptoe, Wardle, & Marmot, 2005). Overall, these indicators of good physical health were independent of the age, the socioeconomic status and the negative emotional state of these women. Furthermore, it was found that in a group of healthy middle-aged men, those who manifested a more positive affective state, measured by aggregating their mood assessments obtained at 4 different times over 2 working days, had a lower inflammatory response (assessed by fibrinogenous concentrations in plasma¹) and lower blood pressure when they were exposed to mentally stressful tasks under laboratory conditions (Steptoe, Gibson, Hamer, & Wardle, 2007).

For its part, although life satisfaction is a more general indicator with more cognitive components than positive affect, it has also been linked to longer life expectancy. Koivumaa-Honkanen and her collaborators (2000) conducted a

¹ Fibrinogen is a protein responsible for the formation of fibrin due to degradation. It has been associated with higher heart attack risk.

twenty-year longitudinal study with more than 22,000 healthy people. This study showed that life satisfaction could predict the mortality rate in this sample, even after controlling variables such as age, marital status, social status, smoking, alcohol intake and physical activity.

In summary, it seems to be increasingly evident that positive affect plays an important role in health. However, it is still premature to establish definitive causal relations. Positive affect, though, not only contributes to reduce the risk of illness but it also seems to facilitate recovery. Thus, people with more positive affect have almost three times as many possibilities to recover, in one year, after health problems such as heart attack, stroke or hip fracture (Ostir *et al.*, 2002).

Positive emotions and health. Proposed models

Pressman and Cohen (2005) propose that the influence of positive affect on health can be accounted for by two models. One of them highlights the direct effect of positive affect on the physiological system, as represented by Figure 2.

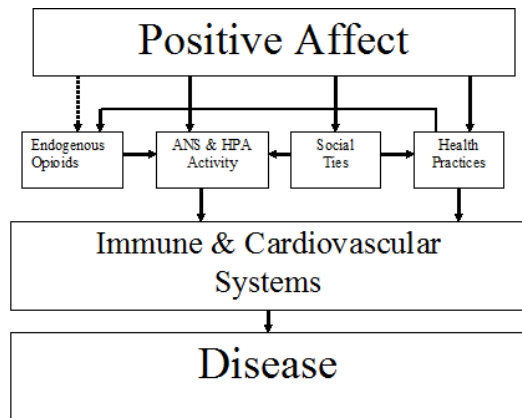


Figure 2. Direct influence of positive affect on health model (ANS: autonomous nervous system; HPA: hypothalamic-pituitary-adrenal axis). (Reproduced with permission of the copyright owner, Pressman & Cohen, 2005).

According to this model, positive affect encourages healthy practices, such as improving quality sleep, doing more physical exercise or having a more balanced diet, which are at the same time related to lower morbidity and mortality rates. Positive affect also works on the autonomic nervous system (ANS), generally by reducing heart rate, blood pressure and the epinephrine and norepinephrine levels in the blood. It affects the hypothalamic-pituitary-adrenal axis, as the presence of positive affect has been related to lower levels of cortisol in the blood (a hormone related to self-immune and inflammatory diseases) and, to a lesser extent, to higher levels of oxytocin and the growth hormone. Furthermore, positive affect favours the presence of endogenous opioids (endorphins), both indirectly, via physical activity, and in a more direct way through general emotional activation (Gerra *et al.*, 1996, 1998). These endorphins reduce the activity in the ANS and in the endocrine system (Drolet *et al.*, 2001) and modify the immune function (McCarthy, Wetzel, Sliker, Eisenstein, & Rogers, 2001). Apart

from this, even though it is widely known that isolation and the presence of few or rather inefficient social nets is related to higher risk of morbidity and mortality (Cohen, 2004; Elliot & Humberson, 2004), there starts to be evidence that positive affect facilitates creating and keeping social links, which protect good health. More specifically, social reciprocity, that is, perceiving that one offers oneself to the social net but is also rewarded by it, is linked to a better health state (Siegrist, 2005).

It is probable that positive emotions are likely to have a direct effect on the body system (Barak, 2006). In fact, laboratory findings suggest that this can be so. Some studies have shown that various types of pleasant stimuli can have different psycho-biological impacts (Watanuki & Kim, 2005). For example, left frontal cortex activity increases in the presence of pleasant smells, whilst positive verbal stimuli increase the secretion of immunoglobulin A, a typical parameter of immune system activity, and decrease cortisol in the saliva, a parameter of activity in the hypothalamic-pituitary-adrenocortical system, which is involved in discriminating affective stimuli and emotional expression. Some studies have also shown that positive affect is associated to some electrical cortical activation patterns (Urry *et al.*, 2004), and good everyday mood is related to high levels of the serotonergic central function (Flory, Manuck, Matthews, & Muldoon, 2004), which may also be important due to its relationship to higher insulin resistance and blood pressure levels. It has been known for years that inducing positive mood, by watching a comedy film, for example, may improve the immediate responses of the immune system, assessed by measuring immunoglobulin A in the saliva (Dillon, Minchoff, & Baker, 1985).

The second approach to account for the relationship between positive affect and health highlights the influence of stress on the physiological system. In this case, positive affect works as a buffer of stress by reducing the pernicious stress effects on the system, as represented by Figure 3.

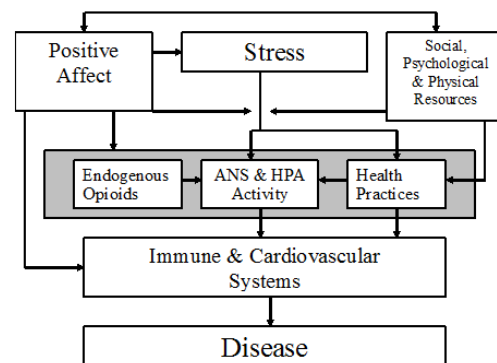


Figure 3. Indirect influence of positive affect on health model. (ANS: autonomous nervous system; HPA: hypothalamic-pituitary-adrenal axis). (Reproduced with permission of the copyright owner, Pressman & Cohen, 2005).

According to the second approach, positive affect influences responses to stress at different levels. Firstly, people enjoying more positive affect do not have so many social conflicts, so they have a fewer number of stress factors to manage. Secondly, when having to deal with potentially stressful situations, people with more positive affect have

better social networks on which they can rely on. Therefore they use more effective coping strategies which, in turn, also lead them to feel that they can cope with problems. Furthermore, positive affect makes it possible for physiological responses to return faster to a normal state after a stressful event (Fredrickson & Levenson, 1998; Fredrickson, 2009).

Even though most studies on the influence of positive affect on health indicate that such positive activity is related to lower morbidity, lower mortality, better life quality and functioning, lower number of symptoms, less serious diagnosis and greater survival, some studies have found an inverse relation, especially in people with serious diseases. This finding can be accounted for by the fact that people with more positive affect who are suffering from serious diseases can sometimes underestimate the number of symptoms, tend to be excessively optimistic about their prognosis development and so are less strict in following medical prescriptions (Derogatis, Abeloff, & Melisaratos, 1979; Devins *et al.*, 1990).

Health and eudaimonic well-being

With regard to eudaimonic well-being, there is also growing data about its association with health-related biological indicators and, surprisingly, this type of well-being has been found to have a more consistent relation with physical health than the hedonic well-being measures (Vázquez & Castilla, 2007). The reasons for this fascinating finding are unclear; however, eudaimonic well-being may be related to short and long-term affect regulation mechanisms through the search for survival behaviours and others adjusting to environmental demands (e.g. giving sense to experience, searching for the positive in what happens to us, adjusting life goals, and so on), whereas hedonic well-being, although subjectively more important, is more related to satisfaction and enjoyment of immediate circumstances (Vázquez & Castilla, 2007).

The research group led by Carol Ryff, has found some of the most interesting results in this area. In samples with elderly women, they have found that those with higher levels of life purpose, more feelings of personal growth and better interpersonal relationships showed lower cardiovascular risk (lower levels of glycosylated hemoglobin², lower body weight, lower waist to hip ratios, higher rates of 'good' cholesterol (HDL) and better endocrine regulation, that is, lower cortisol levels in the saliva throughout the day (Ryff *et al.*, 2006; Ryff, Singer, & Love, 2004).

This link between lower cortisol levels and eudaimonic well-being has also been tested in other studies (e.g. Lindfors & Lundberg, 2002). As for inflammatory factors, people with better interpersonal relationships—interpersonal well-being—and feelings of life purposes show lower levels of interleukin 6 (IL-6) and its soluble interleukin

receptor (sIL-6r) (Friedman *et al.*, 2005; Friedman, Hayney, Love, Singer, & Ryff, 2007).

Many of these variables (systolic and diastolic blood pressure, waist width, measures of cholesterol, hemoglobin, cortisol, epinephrine and norepinephrine levels) are related to the so-called allostatic load³ (Ryff & Singer, 2002). Longitudinal studies of ageing have shown that high allostatic load predicts cardiovascular diseases, cognitive and physical deterioration and mortality. Women are less likely to have high allostatic load than men, which may be significant, as women's life expectancy is 7 years longer.

An especially important issue about the role of eudaimonic well-being in biology and health is that it seems to work as a buffer or protector in face of the adverse effects of negative experiences (Fredrickson, 2009). For example, some studies have shown that elderly women with sleep deficiency (defined as the total time asleep divided by the total time in bed), had higher interleukin IL-6 levels (Friedman *et al.*, 2005). This difference, however, disappeared in the subgroup of women with a good level of interpersonal well-being.

In the prediction of glycosylated hemoglobin (HbA1c), Ryff's research group has found that women with a lower economic level show an increase of this parameter over time (Tsenkova, Love, Singer, & Ryff, 2008) but the results are moderated both by the role of hedonic factors, (*i.e.*, positive affect) and eudaimonic factors (*i.e.* life purpose and personal growth). But a very relevant aspect in the study is that the HbA1c levels in women with high positive well-being did not differ on the basis of their socioeconomic status.

The role of optimism in health

Optimism is, of all personality traits, the most relevant for this review since, in addition to being strongly associated with greater well-being, it seems to play an important role in physical health (Avia & Vázquez, 1998). Numerous research studies have shown that optimism is related to higher protection in face of disease and to higher life expectancy. For example, Peterson, Seligman and Vaillant (1988) carried out an analysis of personal writings on situations experienced during World War II by a group of 99 Harvard University graduates. Over thirty years later, the optimists had better health and showed less mortality than the pessimists. Maruta, Colligan, Malinchoc and Offord (2000, 2002) found a similar result in a sample with more than 700 general medicine patients who had been assessed on an optimism scale. Thirty years later it was shown that not only did the optimists live longer than the rest of the participants (50% risk of death reduction) but their survival rate was significantly better than the one expected on the basis of their social and demographic characteristics, namely age, sex and year of birth. Furthermore, they had better physical and mental health, which was assessed by

² A form of hemoglobin (HbA1c) used above all to identify the average plasma glucose concentration during long periods of time. It can monitor average glucose in the blood in relation to a 2-3 month period previous to the testing and is also a relevant diabetic and cardiovascular risk marker.

³ Allostatic load has been defined as the cumulative strain on several physiological systems (cardiovascular, the metabolic system—the hypothalamic-pituitary-adrenal axis—and the sympathetic nervous system).

means of the SF-36 questionnaire (Short-Form Health Survey)

Optimism seems to have some influence on resistance to illness and health improvement but, through what mechanism? Just as previously described about the influence of positive effect on health, optimism can affect health through several paths. Firstly, optimism, hope and positive expectations are elements that can protect health in challenging situations for people's equilibrium (Vázquez & Castilla, 2007; Taylor *et al.*, 2000) by means of direct paths. For example, body systems of the most optimistic people generate better immunocompetence responses than those of the pessimistic ones, taking as an indicator the activity of NK cells (natural killers)- (Sieber, Rodin, Larson, & Ortega (1992).

In general terms, optimism also seems to be related to a better state of the immune system. Kamen-Siegel, Rodin, Seligman and Dwyer (1991) showed the relationship between an optimistic thinking style and better immune system responses in a group of 62-87 year old healthy people. Optimism's benefits were reflected in a lower presence of T8 suppressor cells. Optimism is associated to better mood, greater NK cell cytotoxic activity and a greater number of T helper⁴ cells (Seegerstrom, Taylor, Kemeny, & Fahey, 1998). Even in studies of women with breast cancer, in addition to other psychosocial variables such as the fact of having a steady relationship, initial optimism is a predictor of the quality of life several years later (Carver, Smith, Antoni, Petronis, Weiss *et al.*, 2005).

Beyond the influence on the immune system, optimism seems to prevent diseases in two basic systems for survival, namely the respiratory and the circulatory systems. In an eight-year prospective study, Kubzansky and her collaborators examined the effects of optimism on lung performance in a group of 670 men between 45 and 89 years old. Those with a more optimistic attributional style had greater lung performance levels and a slower decline of this function, irrespective of smoking. An additional study observed that after a ten-year follow-up period, the optimists had half the risk of suffering from coronary heart disease than those with high levels of pessimism (Kubzansky, Sparrow, Boconas, & Kawachi, 2001).

Secondly, a tendency towards optimism can affect health through the behaviour manifested in face of life problems in general and health problems in particular. This behaviour, if appropriate, can prevent chronic stress and the complication of physical and/or psychological problems. In this sense, optimism is very relevant, as it seems to encourage active strategies to cope with stress and health problems, which is related to problem solving behaviours, self-care and recovery plans (Scheier, Weintraub, & Carver, 1986). For example, in the study conducted by Scheier and his collaborators (1989) with a group of patients undergoing coronary bypass, the most optimistic ones, assessed before the surgical intervention, not only made more active rehabilitation

plans, but showed better recovery and life quality six months later in relation to resuming work and free-time, social and sexual activities.

CONCLUSIONS

All the findings described in this paper concur with the same idea, namely well-being is not only associated with greater psychological satisfaction, but it also has important implications for physical health. Whether assessed from a hedonic or eudaimonic approach, well-being seems to play a role in preventing and recovering from physical conditions and illnesses, even permitting an increase in life expectancy. The convergence of results should not suggest that the relation between well-being and health is a simple one. Rather the contrary, well-being seems to enhance health from various perspectives and through different paths. Firstly, all positive affect, life satisfaction and various dimensions of the eudaimonic well-being proposed by Ryff seem to predict positive health outcomes. Secondly, it seems clear that there are many well-being action paths to physical health. Well-being seems to have a direct relation with some physical protection parameters, such as the ones associated with immune capacity, but it can also have an effect through other paths, such as the increase of healthy behaviour, good health problem coping strategies, or stress buffers.

All these data suggest that promoting well-being can have important health effects. First of all, we should bear in mind the high, and difficult to estimate, cost of an illness and an early death. Secondly, we keep in mind the sanitary costs and other indirect costs such as sick leaves, lack of productivity, and so on. On the basis of this situation, it could be concluded that promoting well-being may be useful not only from a social and humane point of view, but also from an economic perspective (DeVol & Bedroussian, 2007). Therefore, the measurement and promotion of well-being becomes a desirable social and political objective (Diener, Lucas, Schimmack & Helliwell, 2009; Vázquez, 2009b). This is even more of a truth in the case of some groups, such as elderly people, who, fundamentally due to cultural reasons, find it more difficult to feel good about themselves and about the activities they perform. Besides, as shown by a longitudinal study which took more than 20 years to carry out, the people with more positive perceptions of their ageing at the base line (when they were 50 years of age or older) lived longer (an average of 7.6 more years) than those who showed more negative perceptions about their own ageing (Levy, Slade, Kunkel, & Kasl, 2002). Therefore, promoting well-being in this period of life is especially necessary.

Findings described in this article also transmit the importance that health units and health professionals should pay attention to different emotional states, well-being versus discomfort. All the data shown suggests that enhancing positive emotions might improve health at the same level as the one shown by other activities, such as physical exercise, good nourishing or giving up smoking (Vázquez, Hernangómez, & Hervás, 2004). However, it is very unusual to come across preventive

⁴ T helper cells assist other white blood cells in immunologic processes, including activation of cytotoxic T cells and macrophages, among other functions.

programmes enhancing well-being and positive emotions. So is it very difficult to find health professionals who give answers to the important role of well-being and positive emotions as healthy life elements. Disseminating these findings among doctors, nurses and other health professionals may be a necessary way to increasingly turn the current lack of attention to the positive within the health area into greater awareness and greater resources to put it into effect.

Looking further afield, public institutions should also be more aware of the mind and body connection and, specifically, of the role played by well-being in illness recovery and prevention. Designing and applying specific well-being promotion programmes into different life phases and encouraging the research of this association on specific illnesses are only some of the ways how institutions and professionals can respond to the importance of these findings.

Finally, it might be important to socially disseminate these findings in order to spread the idea that maintaining and increasing well-being is an important aim in times of good health, but also when health is seen to be threatened. As we said, this is crucial in elderly people, but also in other periods of life during which maintaining well-being is often pushed into the background as the result of overrating some professional or other aims.

This article started by reflecting on what the contribution of positive psychology to health and clinical medicine might be. As a conclusion of the review that we have undertaken, we think that these contributions can be fertile and varied, as long as:

1. This psychological approach promotes important conceptual changes in the definition of positive health by anchoring them into a complex vision of well-being which includes hedonic and eudemonic components (Vázquez, 2009a)
2. It incorporates the analysis and research of emotions and cognitions so far ignored by scientific psychology (Fernández-Abascal, 2009) and of great interest in the field of intervention (Vázquez, Hervás, & Ho, 2008; Hervás, Sánchez, & Vázquez, 2008; Vázquez, Pérez-Sales, & Hervás, 2008).
3. It favours research into the role of positive emotions and cognitions in the origin and maintenance of physical and mental well-being.
4. It redefines what is understood as therapeutic change and 'recovery' by using a wider and more comprehensive perspective than the traditionally used symptom based criteria (Zimmerman et al., 2006; Vázquez & Nieto, in press).
5. It incorporates a multidisciplinary perspective on the promotion of well-being which implies all individual, social and institutional spheres (Seligman, 2003; Vázquez & Hervás, 2008).

In conclusion, even though a valuable path has been covered, the future presents numerous challenges that should be addressed with the objective of shaping many of the research lines on the relationship between well-being and health. Some of the challenges belong to the scientific community, but we should not forget that other important steps correspond to public institutions and to the society as

a whole.

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