



A Positive Psychology update from Dr. Martin E. P. Seligman:  
Positive Health  
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In the mid-1980s, 120 men from San Francisco had their first heart attacks, and they served as the untreated control group in the massive Multiple Risk Factor Intervention Trial (acronymic MR FIT) study. This study disappointed many psychologists and cardiologists by ultimately finding no effect on CVD by training to change these men's personalities from type A (aggressive, time urgent, and hostile) to type B (easygoing). The 120 untreated controls, however, were of great interest to Gregory Buchanan, then a graduate student at Penn, and to me because so much was known about their first heart attacks: extent of damage to the heart, blood pressure, cholesterol, body mass, and lifestyle—all the traditional risk factors for cardiovascular disease. In addition, the men were all interviewed about their lives: family, job, and hobbies. We took every single “because” statement from each of their videotaped interviews and coded it for optimism and pessimism.

Within eight and a half years, half the men had died of a second heart attack, and we opened the sealed envelope. Could we predict who would have a second heart attack? None of the usual risk factors predicted death: not blood pressure, not cholesterol, not even how extensive the damage from the first heart attack. Only optimism, eight and a half years earlier, predicted a second heart attack [i] : of the sixteen most pessimistic men, fifteen died. Of the sixteen most optimistic men, only five died.

This finding has been repeatedly confirmed in larger studies of cardiovascular disease, using varied measures of optimism:

Veterans Affairs Normative Aging Study. In 1986, 1,306 veterans took the Minnesota Multiphasic Personality Inventory (MMPI) and were tracked for ten years. During that time, 162 cases of cardiovascular disease occurred. The MMPI has an optimism-pessimism scale that reliably predicts mortality in other studies. Smoking, alcohol use, blood pressure, cholesterol, body mass, family history of CVD, and education were measured, as was anxiety, depression, and hostility, and all of these were controlled for statistically. Men with the most optimistic style (one standard deviation above average) had 25 percent less CVD than average, [ii] and men with the least optimism (one standard deviation below the mean) had 25 percent more CVD than average. This trend was strong and continuous, indicating that greater optimism protected the men, whereas less optimism weakened them.

European Prospective Investigation. More than 20,000 healthy British adults were followed from 1996-2002 during which 994 of them died, 365 of them from CVD. Many physical and psychological variables were measured at the outset of the study: smoking, social class, hostility, and neuroticism, for example. Sense of mastery was also measured by seven questions:



1. I have little control over the things that happen to me.
2. There is really no way I can solve some of the problems I have.
3. There is little I can do to change many of the important things in my life.
4. I often feel helpless in dealing with the problems of life.
5. Sometimes I feel that I am being pushed around in life.
6. What happens to me in the future mostly depends on me.
7. I can do just about anything I really set my mind to do.

These questions capture the continuum from helplessness to mastery. Death from cardiovascular disease was strongly influenced by a sense of mastery, [iii] holding smoking, social class, and the other psychological variables constant. People high (one standard deviation above the mean) in mastery had 20 percent fewer CVD deaths than those with an average sense of mastery, and people high in a sense of helplessness (one standard deviation below the mean in a sense of mastery) had 20 percent more CVD deaths than average. This was also true of deaths due to all causes and—to a lesser extent but still significant statistically—of deaths from cancer.

Dutch Men and Women. Beginning in 1991, 999 sixty-five to eighty-five-year-olds were followed for nine years. In that time, 397 of them died. At the outset, researchers measured health, education, smoking, alcohol, history of cardiovascular disease, marriage, body mass, blood pressure, and cholesterol were measured, along with optimism, which was measured by four items answered on a 1-to-3 scale of agreement:

1. I still expect much from life.
2. I do not look forward to what lies ahead for me in the years to come.
3. I am still full of plans.
4. I often feel that life is full of promises.

Pessimism was very strongly associated with mortality, [iv] particularly when holding all the other risk factors constant. Optimists had only 23 percent the rate of CVD deaths of the pessimists, and only 55 percent the overall death rate compared to the pessimists. Interestingly this protection was specific to optimism, a future-oriented cognition, and present-oriented mood items such as “Happy laughter often occurs” (this must read better in Dutch) and the items such as “Most of the time, I am in good spirits,” did not predict mortality.

In contrast, in the 1995 Nova Scotia Health Survey, a team of nurses rated the positive emotion (joy, happiness, excitement, enthusiasm, contentment) of 1,739 healthy adults. Over the next ten years, participants with high positive emotion experienced less heart disease, with 22 percent less heart disease for each point on a five-point scale of positive emotion. Optimism was not measured, so we cannot determine if positive emotion worked through optimism. [v]



The influence of Dutch optimism was a continuous trend, with more optimism associated with fewer deaths along the entire dimension. These findings show that the effect is bipolar: high optimists die at a lower rate than average, and high pessimists die at a higher rate than average. Recall here the thrust of Paul Tarini's question Are there health assets that protect, and not just risk factors that weaken, the body? Optimism, in this study, strengthened people against Cardiovascular Disease when compared to the average person, just as pessimism weakened them compared to average.

Is depression the real culprit? Pessimism, in general, correlates pretty highly with depression, and depression, in many studies, also correlates with cardiovascular disease. So you might wonder if the lethal effect of pessimism works by increasing depression. The answer seems to be no, since optimism and pessimism exerted their effects even when depression was held constant statistically.

Women's Health Initiative. In the largest study of the relationship between optimism and cardiovascular disease to date, ninety-seven thousand women, healthy at the outset of the study in 1994, were followed for eight years. As usual in careful epidemiological studies, age, race, education, religious attendance, health, body mass, alcohol, smoking, blood pressure, and cholesterol were recorded at the start. Epidemiological studies investigate patterns of health in large populations. Optimism was measured in yet another way by the well-validated Life Orientation Test (LOT), which poses ten statements such as: "In unclear times, I usually expect the best," and "If something can go wrong for me, it will." Importantly, depressive symptoms were also measured and their impact assessed separately. The optimists (the top quarter) had 30 percent fewer coronary deaths than the pessimists [vi] (bottom quarter). The trend of fewer deaths, both cardiac and deaths from all causes, held across the entire distribution of optimism, indicating again that optimism protected women and pessimism hurt them relative to the average. This was true holding constant all the other risk factors—including depressive symptoms.

Something worth living for. [vii] There is one trait similar to optimism that seems to protect against cardiovascular disease: ikigai. This Japanese concept means having something worth living for, and ikigai is intimately related to the meaning element of flourishing (M in PERMA) as well as to optimism. There are three prospective Japanese studies of ikigai, and all point to high levels of ikigai reducing the risk of death from cardiovascular disease, even when controlling for traditional risk factors and perceived stress. In one study, the mortality rate among men and women without ikigai was 160 percent higher than for increased CVD mortality as compared to men and women with ikigai. In a second study, men with ikigai had only 86 percent of the risk of mortality from CVD compared to men without ikigai; this was also true of women, but less robustly so. And in a third study, men with high ikigai had only 28 percent of the risk for death from stroke relative to their low-ikigai counterparts, but there was no association with heart disease.



## Summary of Cardiovascular Disease

All studies of optimism and CVD converge on the conclusion that optimism is strongly related to protection from cardiovascular disease. This holds even correcting for all the traditional risk factors such as obesity, smoking, excessive alcohol use, high cholesterol, and hypertension. It even holds correcting for depression, correcting for perceived stress, and correcting for momentary positive emotions. It holds over different ways of measuring optimism. Most importantly, the effect is bipolar, with high optimism protecting people compared to the average level of optimism and pessimism, and pessimism hurting people compared to the average.

Why optimists are less vulnerable to disease. How might optimism work to make people less vulnerable and pessimism to make people more vulnerable to cardiovascular disease? The possibilities divide into three large categories:

1. Optimists take action and have healthier lifestyles. Optimists believe that their actions matter, whereas pessimists believe they are helpless and nothing they do will matter. Optimists try, while pessimists lapse into passive helplessness. Optimists therefore act on medical advice readily, as George Vaillant found when the surgeon general's report on smoking and health came out in 1964; it was the optimists who gave up smoking, [viii] not the pessimists. Optimists may take better care of themselves. Even more generally, people with high life satisfaction (which correlates highly with optimism) are much more likely to diet, not to smoke, and to exercise regularly than people with lower life satisfaction. According to one study, happy people also sleep better than unhappy people [ix] . Optimists not only follow medical advice readily, they also take action to avoid bad events, whereas pessimists are passive: optimists are more likely to seek safety in tornado shelters when there is a tornado warning than pessimists, who may believe the tornado is God's will. The more bad events that befall you, the more illness.
2. Social support. The more friends and the more love in your life, the less illness. George Vaillant found that people who have one person whom they would be comfortable calling at three in the morning [x] to tell their troubles were healthier. John Cacioppo found that lonely people are markedly less healthy than sociable people. [xi] In an experiment, participants read a script over the phone to strangers—reading in either a depressed voice or a cheerful voice. The strangers hang up on the pessimist sooner than on the optimist. Happy people have richer social networks than unhappy people, and social connectedness contributes to a lack of disability as we age. Misery may love company, but company does not love misery, and the ensuing loneliness of pessimists may be a path to illness.
2. Biological mechanisms. There are a variety of plausible biological paths. One is the immune system. Judy Rodin (whom I mentioned in the opening of the book), Leslie Kamen, Charles Dwyer, and I collaborated together in 1991 and took blood from elderly optimists and pessimists and tested the immune response. The blood of



optimists had a feistier response to threat [xii] —more infection-fighting white blood cells called T lymphocytes produced—than the pessimists. We ruled out depression and health as confounds.

Another possibility is common genetics: optimistic and happy people might have genes that ward off cardiovascular disease or cancer.

Another potential biological path is a pathological circulatory response to repeated stress. Pessimists give up and suffer more stress, whereas optimists cope better with stress. Repeated episodes of stress, particularly when one is helpless, likely mobilize the stress hormone cortisol and other circulatory responses that induce or exacerbate damage to the walls of blood vessels and promote atherosclerosis. [xiii] Sheldon Cohen, you will recall, found that sad people secrete more of the inflammatory substance interleukin-6, and that this results in more colds. Repeated episodes of stress and helplessness might set off a cascade of processes involving higher cortisol and lower levels of the neurotransmitters known as catecholamines, leading to long lasting inflammation. Greater inflammation is implicated in atherosclerosis, and women who score low in feelings of mastery and high in depression have been shown to have worse calcification of the major artery, the trunk-like aorta. [xiv] Helpless rats, in the triadic design, develop atherosclerosis at a faster rate than rats that mastery. [xv]

Excessive production by the liver of fibrinogen, a substance used in clotting the blood, is another possible mechanism. More fibrinogen leads to more blood clots in the circulatory system by making the blood sludgy. People with high positive emotion show less of a fibrinogen response [xvi] to stress than unhappy people.

Heart rate variability (HRV), surprisingly, is another candidate for protection against cardiovascular disease. HRV is the short-term variation in beat-to-beat intervals, which is partly controlled by the parasympathetic (vagal) system of the central nervous system. This is the system that produces relaxation and relief. Accumulating evidence suggests that people with high heart rate variability are healthier, have less CVD, less depression, and better cognitive abilities. [xvii]

The mechanisms proposed above have not been well tested. They are simply reasonable hypotheses, but each can be bi-directional, with optimism adding to protection compared to the average, and pessimism weakening people compared to the average. The gold standard for finding out if optimism is causal and how it works is the optimism intervention experiment. There is an obvious and expensive experiment very much worth doing: we take a large group of people vulnerable to CVD, randomly assign half to optimism training and half to a placebo, monitor their action, social, and biological variables, and see if optimism training is lifesaving.