of the patients in the control group had guessed they were in treatment. More significantly, despite the fact that they were doing significantly better than the control group, nearly half the patients in the treatment group thought that they were not being treated.

The second approach to this issue was to ask whether the patients in either group who thought that they were being treated showed significantly better outcomes on any measures. It turned out that in the early stages of the study, the patients who thought they were being treated were those whose T-cell counts had been rising (a fact that would have been known to them and may account for their guess). In the later part of the study, the patients who were showing more recoveries from AIDS-defining illnesses were more likely to guess they were being treated. Significantly, believing one was being treated did not correlate with severity of illness, with development of new illness, with psychological outcomes, or with medical utilization. Thus it appears that expectation does not account for the differential benefits seen in patients of the treatment group.

The above data represent the strongest published research evidence of an effect of mind on health. Clearly research in this area is still in its preliminary stages, but it serves to greatly broaden our notion of what a mind–body effect may constitute.

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Positive and negative beliefs and the course of AIDS: Taylor et al. (2000)

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Mounting evidence suggests that thoughts, feelings, and expectations contribute to health and illness. This case is made especially forcefully in the investigations of Margaret Kemeny, Shelley Taylor, and their colleagues into the effects of expectations on the course of HIV infection. For years, scientists have known that psychological beliefs such as optimism, personal control, and a sense of meaning protect mental health. Now there is evidence that these psychosocial states predict physical health as well. A set of interrelated investigations, reviewed in Taylor et al. (2000), show that psychological states affect immune function and the progression of immune-related disease, specifically AIDS.

Psychological resources, positive illusions, and health

Shelley E Taylor, Margaret E Kemeny, Geoffrey M Reed, Julienne Bower and Tara L Gruenewald (2000)

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Psychological beliefs such as optimism, personal control, and a sense of meaning are known to be protective of mental health. Are they protective of physical health as well? The authors present a program of research that has tested the implications of cognitive adaptation theory and research on positive illusions for the relation of positive beliefs to disease progression among men infected with HIV. The investigations have revealed that even unrealistically optimistic beliefs about the future may be health protective. The ability to find meaning in the experience is also associated with a less rapid course of illness. Taken together, the research suggests that psychological beliefs such as meaning, control, and optimism act as resources, which may not only preserve mental health in the context of traumatic or life-threatening events but be protective of physical health as well.

The theoretical context for this work is Taylor and Brown's (1988) research on "positive illusions." That work found that optimism, a sense of personal control, and the ability to find meaning in life experiences are valuable psychological resources. There are several reasons to believe that these positive beliefs might influence the course of physical diseases as well. For example, positive beliefs have an impact on emotional states, which may affect the physiology and neuroendocrine underpinnings of disease states. Such psychological states as depression and anxiety, for example, have a variety of physiological concomitants that have been related to altered immune processes (see, for example, Herbert & Cohen 1993) and to the development of disease (for example, Frasure-Smith et al. 1995; Booth-Kewley & Friedman 1997).

HIV is a valuable context for examining the benefits of positive beliefs on disease course, in part because it provides an opportunity to examine criticisms of the positive illusions formulation. Some psychologists maintain that when terminally ill people realistically accept death as an inevitable outcome, they are being adaptive, allowing themselves to come to terms with their situations and to prepare for their passing. However, our position argues that positive beliefs are psychologically protective, reducing mental distress and potentially retarding disease progression, even at the end of life.

To test this idea, we recruited 78 gay men with AIDS and asked them to rate their health status, psychological adjustment, and psychological responses to HIV (Reed et al. 1994). Using these answers, we divided participants into two groups: Those who scored high on realistic acceptance of their disease, and those who scored low on realistic acceptance. The high realistic acceptance group demonstrated an accurate sense of their situation and an awareness of their imminent death. In contrast, the low realistic acceptance group demonstrated the optimism and sense of control characteristic of positive illusions. After controlling for various biological predictors of death, we found a significant difference between the average life span of these two groups, with individuals high in realistic acceptance dying, on average, 9 months earlier than those low in realistic acceptance.

In a second investigation, we extended this analysis to see if positive beliefs are protective at earlier points in the disease process, specifically before symptoms of AIDS have appeared (Reed et al. 1999). We recruited 72 men who were HIV positive but asymptomatic with respect to the disease. As in the first study, these men completed questionnaires that measured expectations regarding their likelihood of succumbing to AIDS. We hypothesized that positive expectations, even unrealistically positive ones, might retard the onset of disease-related symptoms. We examined this hypothesis in the context of bereavement. The experience of losing a close friend or partner to AIDS may cause negative expectations to assume a strength and clarity that might lead to a psychologically and physically compromised state, resulting in deterioration of the immune system. We predicted that among men with negative expectations, those who were also bereaved might be especially likely to show more rapid

progression of the virus. These predictions were supported. Nearly half of the men developed defining symptoms of AIDS over the follow-up period. Those men who held HIV-specific negative expectations and who also had been bereaved were significantly more likely to develop such symptoms (56%) compared with men who held positive expectations or who had not been bereaved (45%).

In a third study, we examined the role of positive illusions and immune function with respect to positive beliefs, specifically that of finding meaning in the bereavement experience (Bower et al. 1998). We hypothesized that positive illusions might be adaptive in the face of life-threatening illnesses in part because they help people find meaning in traumatic events. We recruited 40 men who were initially HIV positive but asymptomatic and who had recently lost a friend or a partner to AIDS. We interviewed them about their bereavement experiences and coded the answers as indicating whether or not the interviewee had found meaning in the bereavement experience. Meaning was defined as a major shift in values, priorities, or perspective in response to the loss. For example, one participant who found meaning in his bereavement experience stated "I keep thinking about what the lessons are for me, what I can learn." The men who found meaning in the bereavement experience were more likely to maintain their immune functioning across the study's duration of approximately 3 years than were the men who found no meaning; these men, in contrast, were more likely to show significant decline in their immune functioning. In addition, the discovery of meaning was associated with a lower rate of AIDS-related mortality.

These studies show that negative expectations regarding one's health can be associated with a more rapid course of disease and that positive beliefs may retard disease progression. All 3 investigations controlled for a variety of potential cofactors that might confound the relationship between positive beliefs and illness progression, including poor health behaviors, lower levels of social support, poor use of medical treatment, non-adherence to medication, and alterations of emotional states such as depression; and the findings held up even with these controls. The work provides strong evidence that negative expectations regarding illness are associated with a faster course of illness in AIDS and that positive beliefs are associated prospectively with greater health and longevity. Taken together, the studies suggest that positive psychological beliefs not only preserve mental health in the face of life-threatening events but are protective of physical health as well.

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