

Optimism and Pessimism as Predictors of Change in Health After Death or Onset of Severe Illness in Family

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The authors prospectively examined changes in health after a major life event (death or onset of severe illness in family) among 5,007 employees (mean age = 44.8 years) whose optimism and pessimism levels were assessed in 1997 and major life events in 2000. Health was indicated by sickness absence days during a period covering 36 months prior to the event and 18 months after the event. Increase in sick days after the event was smaller and returned to the preevent level more quickly among highly optimistic individuals than among their counterparts with low optimism. Parallel changes were not observed in relation to pessimism. These findings suggest that optimism may reduce the risk of health problems and may be related to a faster recovery after a major life event.

Keywords: life orientation, optimism, health, life events, sickness absence

People with a highly optimistic life orientation experience daily events in a more positive way and expect more positive outcomes than pessimists (Scheier & Carver, 1985, 1987). A positive life orientation is believed to be beneficial to health, as highly optimistic individuals appear to attract supportive social relationships, use adaptive coping strategies, and have different health habits than pessimists, who tend to give up and turn away in stressful situations (Brissette, Scheier, & Carver, 2002; Scheier & Carver, 1992; Smith & Williams, 1992). However, empirical evidence showing that high optimism or a lack of pessimism reduces the risk of health problems remains inconclusive.

Studies of functional changes in healthy subjects provide support for the association between life orientation and risk of health

problems. For example, higher optimism, but not lower pessimism, has been found to be prospectively associated with lower ambulatory diastolic blood pressure (Räikkönen, Matthews, Flory, Owens, & Gump, 1999) and better pulmonary function (Kubzansky et al., 2002). Evidence based on self-reported data suggests that higher optimism is also related to smaller increases in stress and depressive symptoms after a major life event (Brissette et al., 2002). A 2-year follow-up of aging men found optimism to predict higher levels of general health perceptions, vitality, and mental health, as well as lower levels of bodily pain (Achat, Kawachi, Spiro, DeMolles, & Sparrow, 2000).

Further support for the relationship between life orientation and health comes from prognostic studies. A large body of research on patients with chronic disease has found higher optimism to be linked to better survival and adaptation (Allison, Guichard, Fung, & Gilain, 2003; Carver et al., 1994; Fitzgerald, Tennen, Affleck, & Pransky, 1993; Fournier, De Ridder, & Bensing, 2002; Maruta, Colligan, Malinchoc, & Offord, 2000; Penedo et al., 2003; Scheier et al., 1999; Symister & Friend, 2003). Separate analyses for optimism and pessimism have shown a lower survival rate for highly pessimistic cancer patients than their less pessimistic counterparts but no difference between individuals with high levels of optimism and those with low levels of optimism (Schulz, Bookwala, Knapp, Scheier, & Williamson, 1996).

There are only a few prospective studies that link life orientation with the development of serious physical illnesses. The Normative Aging Study on older men with no overt cardiovascular disease at entry into the study shows optimism to be associated with a lower incidence of coronary heart disease (Kubzansky, Sparrow, Voko-

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nas, & Kawachi, 2001). In line with this, other studies have found a reduced risk of heart disease for individuals with low pessimism (Dykema, Bergbower, & Peterson, 1995).

In spite of the extensive evidence on the association between life orientation and health, it may be premature to conclude that lower health risk in optimists is a result of a disposition that protects against the adverse effects of stressful life events. Several earlier studies have been based on self-reported measures of health and are thus vulnerable to common-method bias, resulting in some exaggeration of the assessed relationships. Many of the studies reviewed are also likely to be subject to some degree of reverse causation—that is, diagnosed or undiagnosed disease might differently influence reporting of optimism and pessimism, even though the levels of these dispositions may be relatively uniform in normal circumstances (Schulman, Keith, & Seligman, 1993). Furthermore, prior investigations may not have fully accounted for the possibility that life orientation may be affected by the life events experienced by an individual. High optimism and low pessimism might reflect fewer adversities experienced over time (Burger & Palmer, 1992; Lightsey, 1997; Robinson-Whelen, Kim, MacCallum, & Kiecolt-Glaser, 1997; Saudino, Pedersen, Lichtenstein, McClearn, & Plomin, 1997). These more favorable circumstances rather than the life orientation may be the primary cause for health differences. In accordance with this possibility, optimism would represent a marker rather than a buffering factor in a process that begins with environmental risk factors and ends with the onset and progression of disease.

The Present Study

A methodologically desirable way of studying the potential health-buffering effects of high optimism and low pessimism would be to prospectively examine individual variation in the ways in which people react to a similar stressful life event. Death or the onset of severe illness of a family member is a particularly appropriate focus for such an examination, as these major life events have consistently predicted health problems across a large variety of populations (Kivimäki, Vahtera, Elovainio, Lillrank, & Kevin, 2002; Li, Precht, Mortensen, & Olsen, 2003; Martikainen & Valkonen, 1996; Rubin, 1993). Moreover, the occurrence of these life events is likely to be independent of traitlike dispositions such as optimism and pessimism.

We monitored health problems, as indicated by sickness absence records, before, during, and after death or severe illness in the family among employees whose life orientation was determined prior to this event. Differences in correlates and predictive validity between optimism and pessimism suggest that these two constructs may be distinct rather than bipolar opposites (Brenes, Rapp, Rejeski, & Miller, 2002; Marshall, Wortman, Kusulas, Hervig, & Vickers, 1992; Robinson-Whelen et al., 1997). In some studies optimism and pessimism have also shown relatively modest inter-correlations ($r_s = -.02$ to $-.28$; Mroczek, Spiro, Aldwin, Ozer, & Bosse, 1993; Plomin et al., 1992; Robinson-Whelen et al., 1997), and they have loaded to separate factors (Robinson-Whelen et al., 1997; Roysamb & Strype, 2002; Scheier & Carver, 1985). These findings imply that thinking optimistically may not be the same as avoiding pessimistic expectations.

Thus, we studied optimism and pessimism separately. We tested whether an increase in sickness absence after a major life event would be smaller and would return to the preevent level more

quickly among individuals who rate high on optimism than among those who rate low on optimism. A corresponding test was carried out regarding pessimism to determine whether higher pessimism would be related to a greater increase in sickness absence and slower recovery. Furthermore, we examined potential interactions between optimism and pessimism, as the buffering effect of high optimism could be dependent on the level of pessimism, and the risk of sickness absence due to pessimism could vary according to the level of optimism.

Method

Participants and Procedure

This study is part of the ongoing 10-Town Study (Vahtera, Poikolainen, Kivimäki, Ala-Mursula, & Pentti, 2002), coordinated by the Finnish Institute of Occupational Health. The target group of the study comprised municipal workers providing health care, social and welfare services, education, and other services for the residents of the municipalities. There were 793 occupations, ranging from city mayors to cleaners; the largest occupational groups were nurses (17%), teachers (15%), clerks (9%), and kitchen workers (7%). In 1997, we sent 11,570 full-time municipal workers of eight Finnish towns a questionnaire on optimism, pessimism, and other variables (9,615 employees were from a representative sample, and 1,955 employees were from an additional sample from the three largest towns). Of them, 7,732 (67%) agreed to participate in the study and responded to the questionnaire.

In October 2000, we sent a further questionnaire on life events to 6,186 participants who still worked in the municipal services of the towns. A reminder was sent one month later, and 5,007 participants responded to the follow-up survey (response rate 80%), making up the final cohort of this study. To assess changes in health in relation to reported major life events, we obtained respondents' sickness absence records from employers' records and linked them to the data.

Optimism and Pessimism

Dispositional optimism and pessimism were assessed by means of a structured survey instrument, the revised Life Orientation Test (LOT-R; Scheier, Carver, & Bridges, 1994). The measure includes six statements, of which three are worded positively for optimism (e.g., "In uncertain times, I usually expect the best"), and three are worded negatively to indicate pessimism (e.g., "If something can go wrong for me, it will"). The respondents were asked to indicate how well the statements described them in general, as expressed on a scale ranging from 1 (*not at all*) to 4 (*very much so*), a 4-point modification of the standard 5-point response format. Means of the positively and negatively worded items were calculated separately to yield optimism scores and pessimism scores. A high score in the Optimism scale (Cronbach's $\alpha = .65$) referred to high optimism, and a high score in the Pessimism scale (Cronbach's $\alpha = .72$) referred to high pessimism. Responses with no more than one missing value per scale were included in the analysis. The LOT-R includes four filler items that are not used in scoring. To shorten the survey instrument, we did not include these items in the present study.

Major Life Event: Death or Severe Illness of a Family Member

The follow-up questionnaire on life events was based on the list of 16 negative life events derived from those used in earlier studies (Dohrenwend, Krasnoff, Askenasy, & Dohrenwend, 1982; Holmes & Rahe, 1967). In the present study, we focused on the following three categories of particularly stressful major life events: (a) death of spouse or child, (b) severe illness of spouse, or (c) severe illness of another family member. For

each event, the subjects were asked whether the event had occurred during the current year (yes/no), and if yes, the date (month) of the occurrence.

Health Measure: Sickness Absence

We used participants' personal identification numbers (a unique number assigned to each Finnish citizen) to link to the electronic records of sickness absence data kept by the employers. For every participant, the number of sick days was calculated for each month during a 55-month follow-up. The procedures for recording sick leave in the Finnish public sector are considered to be reliable (Kivimäki et al., 2004; Vahtera, Kivimäki, et al., 2004). Each sick-leave period taken by every employee is recorded, including the dates when each spell started and ended. Municipal employees are paid a full salary during their sick leave. Absences resulting from a family member's funeral or caring for a sick child are not recorded as sick leave.

The regulations governing the public sector employment contract allow an employee to be absent from work without loss of salary for 1 day to attend the funeral of a family member and for 3 days to care for his or her own under-10-year-old child with an acute illness. This applies to every occurrence of these specific events irrespective of their number or time frame. Thus, the participants had no reason to falsely report being ill when attending a family member's funeral or when staying at home to care for a sick child.

Demographic Characteristics

Demographic characteristics were measured in standard ways: age, gender, marital status (married or cohabiting; other), and education (middle school, high school, or more). Information about age and gender was obtained from employers' records. Marital status and education were measured by questionnaire when the participant entered the study.

Data Analysis

For participants who reported a major life event, we calculated the number of sick days during each month for 36 months prior to the event to 18 months after the event, resulting in a total of 55 measurement points. For the 11 participants who reported more than one family death or severe illness that had occurred at different times, we calculated absence records for the first event. For participants who did not report major life events, we randomly selected a nonevent month and linked their absence records to the data in a way similar to the method used for those who reported an event. The month was selected by using weights that corresponded to the likelihood that the events occurred in each month in the event group.

The frequency of monthly sickness absence days was not normally distributed. Instead, it took the discrete nonnegative values 0, 1, 2, . . . and demonstrated a strongly skewed distribution, with low values the most frequent and high values rarely observed (i.e., a Poisson distribution). Thus, when performing the analysis, we modeled such a response variable with a Poisson distribution instead of a normal distribution (Diggle, Liang, & Zeger, 1994; McCullagh & Nelder, 1989; North et al., 1993). The repeated measurements of sickness absence of the same subject are correlated observations. For taking into account the correlation, we applied generalized estimating equations (GEE) techniques in the analysis. Liang and Zeger (1986) introduced GEE as a comprehensive and robust method of dealing with correlations when analyzing the data with the generalized linear models. It is possible with the SAS Institute's (1993) GENMOD procedure to fit models to correlated data by the GEE method and apply different types of working correlation structures in the calculations (Diggle et al., 1994; Liang & Zeger, 1986; Lipsitz, Kim, & Zhao, 1994).

Time series analyses involved only participants who experienced a major life event. With the GEE estimation, the mean level of monthly sickness absence rate was first determined between participants who scored either high or low on optimism and between those who scored high or low

on pessimism. Scores above the median referred to high levels of optimism or pessimism, and scores below the median referred to low levels of these constructs (median score was 2.67 for optimism and 1.33 for pessimism). Dichotomization based on the median split was necessary in order to obtain large enough group sizes (a prerequisite for these analyses is variation in sickness absence during each month for all four groups of high vs. low optimism and pessimism). To explore the effect of exposure to major life events on sickness absence over time, we calculated contrasts in the 55-month follow-up for the following periods: 7–12 months and 1–6 months prior to the event; the month the event occurred; and 1–6 months, 7–12 months, and 13–18 months after the event (we used the period 13–36 months prior to the event as the reference category). All analyses were adjusted for potential confounding effects of age, gender, marital status, and education. We expressed changes in absence levels with rate ratios and 95% confidence intervals. Confidence intervals that did not include unity were statistically significant at the $p < .05$ level.

To formally test the potential moderation effects of optimism and pessimism on the relationship between major life events and subsequent sickness absence, we conducted Poisson regression analyses with mean postevent sickness absence as the outcome (McCullagh & Nelder, 1989; SAS Institute, 1993). In these analyses, optimism and pessimism were treated as continuous variables, and the testing was based on the total sample. We fitted a model including the cross-product terms of Optimism \times Event and Pessimism \times Event entered with the main effect terms, demographic variables, and preevent absence level. We also entered the three-way cross-product term of Optimism \times Pessimism \times Event and all the remaining two-way cross-product terms of these three constructs in the model to test whether the moderation effects of optimism and pessimism would be dependent on each other.

We explored in a corresponding manner whether the moderation effects of optimism and pessimism were dependent on demographic characteristics (age, gender, marital status, and education) in four separate models for optimism and four models for pessimism. We corrected probability values to multiple testing with Bonferroni correction (corrected p value = observed p value \times number of tests). Significant interactions were illustrated by showing levels of mean absence days by subgroups of high versus low levels of optimism and pessimism after adjustment for preevent characteristics. To test the robustness of the findings across different cutoff points of optimism and pessimism, we referred to a high level as item scores between 3 and 4 (response options indicating the strongest agreement with the item) and a low level as item scores between 1 and 2 (options with the strongest disagreement with the items).

We studied reverse causality (i.e., the effect of the major life event on life orientation) by repeated measures analysis of variance. We tested interactions between event and time to determine whether changes between pre- and postevent optimism and pessimism scores were dependent on the occurrence of major life events. In addition, we tested the extent to which changes in optimism and pessimism were associated with postevent sickness absence by using Poisson regression analysis. All tests were performed with SAS software (SAS Institute, 1993), and statistical significance was inferred at two-tailed p values.

Results

We obtained a total of 266,031 sickness absence days during 20,193 person years from the employers' records for the 5,007 participants during the 55-month follow-up period (maternity leaves and other absences during which sickness absence was not recorded had been subtracted from the number of person years). On this basis, the mean number of sick days per year was 13.2.

Among the participants, 284 had experienced a major life event, as indicated by death or severe illness of a family member. Descriptive statistics on preevent characteristics and overall sickness absence are shown in Table 1. Women experienced the death or severe illness of a family member slightly more often than men.

There were no associations between preevent life orientation and occurrence of this major life event. Optimism was inversely correlated with pessimism ($r = -.39$ for all participants, $r = -.41$ for those who experienced a major life event), but its correlations with other variables were small or nonsignificant. Pessimism was positively correlated with age and overall sickness absence and negatively correlated with education.

Time Series Analysis

Figure 1 illustrates changes in sickness absence among participants whose family member died or had a severe illness. In all cases, there was an increase in sick days after this major life event. However, the increase was smaller among participants who scored high on optimism than among those who scored low on optimism (see Figure 1A). Moreover, the rate of absence returned to the preevent level within one year among highly optimistic participants but was still elevated among those low on optimism.

For pessimism, a different pattern was found (see Figure 1B). Among highly pessimistic participants, absence levels 1–3 years before the event ($p < .05$) and over 6 months after the event ($p < .01$) were higher than those among participants low on pessimism. Within 6 months after the event, there were no statistically significant differences in absence levels between the two groups ($p = .48$). Thus, absence rates of participants with high pessimism were, in fact, slightly less reactive to the major life event than those of nonpessimists.

Results of the analysis of changes in sickness absence over time by levels of optimism and pessimism for those who had experienced a major event are shown in Table 2. For highly optimistic participants, only a 1.3-fold increased absence rate was observed during the month when the major life event occurred. Among participants with low levels of optimism, the absence rate doubled in the month when the major life event occurred compared with the absence rate before the event. In this group, absence rate was still elevated 1.6-fold, at 7 to 12 months after the event, but after this period, it did not significantly deviate from the preevent levels.

The preevent absence levels were elevated among individuals with high pessimism. Compared with this reference point, no statistically significant changes in absence rates were detected during the month in which the event occurred or later (see Table 2). Among those with low levels of pessimism, the absence rates

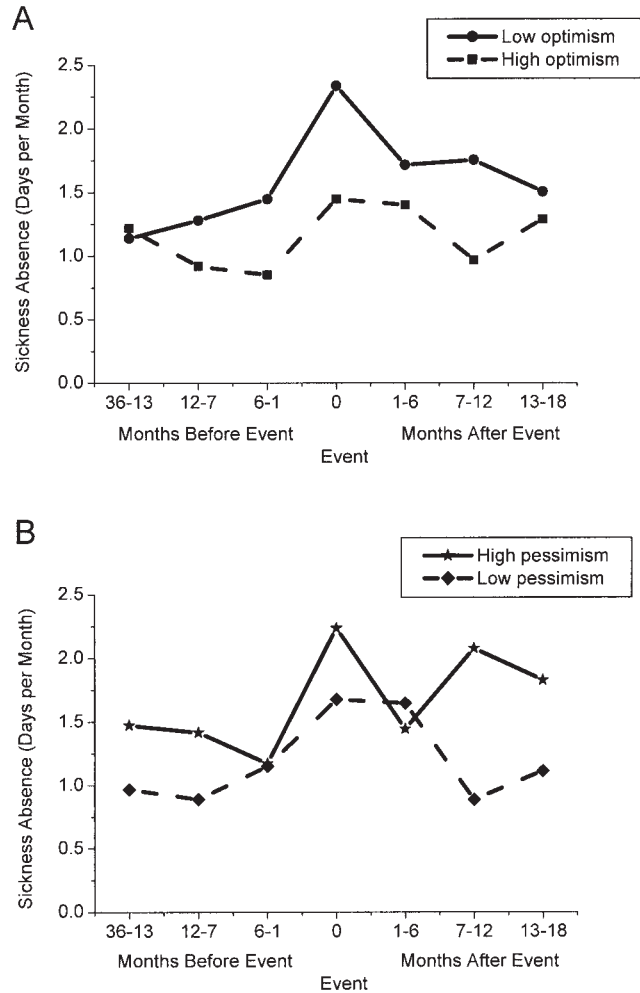


Figure 1. Unadjusted means in monthly sickness absence days before and after a major life event by levels of (A) optimism and (B) pessimism. Levels of optimism and pessimism were measured 26–38 months before the event ($n = 284$).

prior to the event were lower, but they increased during the event month and 1–6 months after the event. These findings indicate

Table 1
Means, Standard Deviations, and Zero-Order Correlations (Pearson r) Among Variables

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. Gender ^a	1.19	0.40	—							
2. Age (years)	44.83	7.53	.05**	—						
3. Marital status ^b	0.21	0.41	-.07**	-.01	—					
4. Education ^c	0.41	0.49	-.00	-.17**	-.03*	—				
5. Optimism	2.78	0.61	-.05**	.03*	-.04**	.05**	—			
6. Pessimism	1.53	0.57	.03*	.10**	.06**	-.15**	.39**	—		
7. Major life event ^d	0.06	0.23	-.02*	-.00	-.01	-.02	-.01	.01	—	
8. Total sickness absence ^e	1.11	1.47	-.08**	.08**	.05**	-.19**	-.04**	.08**	.03*	—

Note. $ns = 4,533-5,007$.

^a 1 = female, 2 = male. ^b 0 = married or cohabiting, 1 = other. ^c 0 = common/middle/comprehensive school, 1 = high school or more. ^d Refers to death or severe illness of a family member; 1 = event, 0 = no event. ^e Mean number of days/month.

* $p < .05$. ** $p < .01$.

Table 2
Rate Ratios (95% Confidence Intervals) Describing Within-Subject Changes Among Optimists and Pessimists in Sickness Absence in Relation to Death or Severe Illness in Family

Level of optimism and pessimism	Months in relation to major life event							
	13–36 months before	7–12 months before	1–6 months before	0	1–3 months after	4–6 months after	7–12 months after	13–18 months after
Low	1.00 (reference)	1.18 (0.83–1.66)	1.28 (0.92–1.79)	2.20 (1.46–3.31)	1.89 (1.19–3.02)	1.11 (0.74–1.66)	1.61 (1.16–2.24)	1.34 (0.91–1.99)
	1.00 (reference)	0.79 (0.50–1.24)	0.73 (0.49–1.08)	1.30 (0.73–2.31)	1.14 (0.71–1.84)	1.26 (0.80–1.99)	0.79 (0.50–1.24)	1.19 (0.70–2.02)
High	1.00 (reference)	0.95 (0.65–1.38)	1.29 (0.91–1.82)	1.88 (1.20–2.95)	2.21 (1.42–3.45)	1.39 (0.96–1.99)	0.99 (0.73–1.36)	1.24 (0.88–1.75)
	1.00 (reference)	1.00 (0.67–1.50)	0.79 (0.53–1.20)	1.63 (0.99–2.70)	0.94 (0.58–1.53)	0.98 (0.59–1.64)	1.46 (0.95–2.23)	1.28 (0.74–2.20)

Note. $n = 284$. Rate ratios (and 95% confidence intervals) were derived from repeated measures Poisson regression models adjusted for age, sex, marital status, and education. Confidence intervals that do not include unity are statistically significant at the $p < .05$ level.

^a Median split; optimism and pessimism were measured 26–38 months before the major life event.

slightly lower reactivity in individuals with high levels of pessimism.

Multiple Testing of Moderated Effects

Table 3 presents a Poisson regression model that tested whether optimism, pessimism, or their interaction moderated the effect of a major life event on the mean level of sickness absence 0–3 months after the event. After controlling for preevent absence level and demographic characteristics, we found a significant moderation effect for optimism but not for pessimism or their interaction. As illustrated in Figure 2, those scoring high on optimism (a mean item score between 3 and 4) had a lower risk of excess sickness absence after the major life event than those scoring low on optimism (a mean item score between 1 and 2). We additionally tested all the three-way interactions between optimism, the major life event, and all demographic characteristics, as well as the corresponding three-way interactions for pessimism. No statistically significant interactions were found. For absences in later postevent periods (i.e., 4–6, 7–12, and 13–18 months after the event), no moderation effects were found.

Change in Optimism and Pessimism

The 3-year test-retest correlation (Pearson correlation coefficient) between scores of optimism at baseline and follow-up was high ($r = .60$, $p < .01$). The corresponding correlation for scores of pessimism was $.58$ ($p < .01$). We examined with repeated measures analysis of variance whether major life events affected the levels of optimism and pessimism scores. Between participants who faced death or severe illness in their family and those who did not, the small changes in optimism scores were not different (all $ps > .30$). In contrast, the level of pessimism rose 10% after the onset of severe illness in one's spouse, whereas absence of such an event was related to a 4% decrease in pessimism ($p = .01$). For

Table 3
Preevent Characteristics, Major Life Event, and Life Orientation as Predictors of Sickness Absence 0–3 Months After the Event, Based on a Poisson Regression Model

Variable	<i>B</i>	$\chi^2(1)$	p^a
Preevent sickness absence ^b	.30	586.85	< .001
Age	.08	5.86	.139
Gender ^c	-.22	9.53	.018
Marital status ^d	.11	3.26	.638
Education ^e	-.09	11.31	.007
Pessimism	-.16	2.45	.999
Optimism	-.32	10.89	.009
Major life event (MLE)	.53	29.36	< .001
Pessimism × MLE	-.25	5.62	.160
Optimism × MLE	-.31	9.29	.021
Pessimism × Optimism	-.23	5.38	.180
Pessimism × Optimism × MLE	.19	3.43	.576

Note. $n = 4,347$. A major life event was defined as the death or severe illness of a family member ($n = 284$).

^a After Bonferroni correction to multiple testing. ^b Level of absence 13–36 months before the event. ^c 1 = female, 2 = male. ^d 0 = married or cohabiting, 1 = other. ^e 0 = common/middle/comprehensive school, 1 = high school or more.

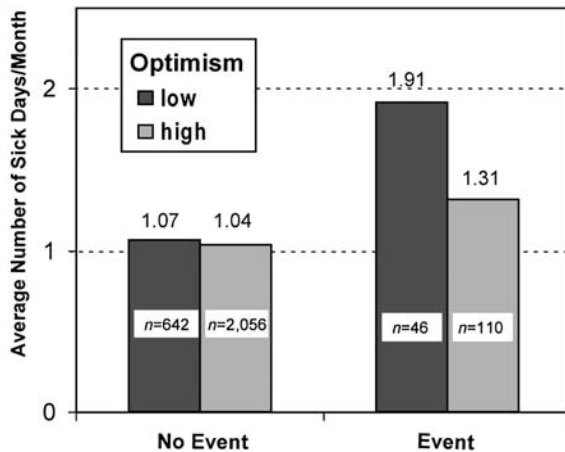


Figure 2. The mean number of monthly sickness absence days 0–3 months after a major life event by levels of optimism. Means are adjusted for age, gender, marital status, education, and preevent absence level ($n = 2,854$).

other events, changes in pessimism were not statistically significant ($ps > .27$).

We used Poisson regression analysis to examine whether a change in optimism or pessimism would contribute to increases in sickness absence. Among participants experiencing a major life event, changes in the levels of optimism and pessimism were unrelated to absences 0–3 months after the event (p values for corresponding regression coefficients were greater than .11 in a model that also included demographic characteristics and preevent absence level).

On the basis of these findings, a change in optimism over time is unlikely to have a significant role in the observed relationships between life orientation, major life events, and sickness absence.

Discussion

We found that individuals scoring high on optimism had a smaller increase in recorded sick days after a major life event, a death, or the onset of severe illness in the family, compared with those scoring low on optimism. The period during which an increase in sickness occurred was also shorter for highly optimistic individuals. Corresponding results were not obtained for low and high levels of pessimism. To our knowledge this is the first large-scale prospective study to demonstrate the protective effects of optimistic life orientation on health after a specific life stress situation that occurs independent of the characteristics of the person.

We used sickness absence records to assess health. It is likely that part of the sick leaves represents voluntary absenteeism not related to physical or mental illness and that some employees, although sick, tend to go to work and record no absences. In spite of this, several studies suggest that sickness absence may be considered a measure of health, at least if the concept of health is understood in terms of social, physical, and mental functioning (Marmot, Feeney, Shipley, North, & Syme, 1995; World Health Organization, 1986). Indeed, sick leaves are a strong correlate of morbidity and disease (Marmot et al., 1995) and are highly predictive of disability retirement (Kivimäki et al., 2004) and overall

mortality (Kivimäki et al., 2003; Vahtera, Pentti, & Kivimäki, 2004). Sick days have also predicted cause-specific mortality, such as deaths from cardiovascular disease, cancer, alcohol-related causes, and suicide (Vahtera, Pentti, & Kivimäki, 2004). In the present study, the use of absence records provided a practical way to monitor changes in health across multiple time points. Such archival data minimized the possibility of common-method bias, risk of selective recall bias, and other problems characterizing research with self-reported data. Illness episodes that do not lead to hospital admission are typically unavailable in health measures based on morbidity records, but they were nevertheless seen in absence figures.

Death or severe illness in the family is largely independent of the characteristics of an individual (Kendler, Gardner, & Prescott, 2003; Kendler, Thornton, & Prescott, 2001). In the present study, optimism and pessimism were not predictive of the occurrence of reported death or severe illness in the family, suggesting that differences in reporting the event were an unlikely source of confounding in our data. A slightly greater proportion of women than men experienced death or severe illness of a family member. This can be anticipated, given the higher mortality rates among men in Finland and other Western countries.

Protective Effect of Optimism

We found a substantial protective effect of optimism, both in terms of reduced risk of sickness and faster recovery. On the basis of time series analyses of 55 repeated measurements of absences, a family death or severe illness was associated with a 1.3-fold increase in sick days among individuals scoring high on optimism, whereas for those scoring low on optimism, the corresponding increase was four times greater, that is, 2.2-fold. Increased sickness absence levels were seen 12 months after the major life event among those with low optimism but not among their counterparts with high optimism. The results add to the existing evidence of the buffering role of optimism. In contrast, our data do not support the reversed causality hypothesis as an explanation for the optimism–health relationship. Confounding by stable third factors is also an unlikely explanation for the associations between optimism and health that we observed in the present study, because no chronic condition is likely to produce temporary health differences that are limited to time periods after a specific event.

Although the occurrence of death or illness of a loved one is independent of optimism, an optimistic outlook may be associated with the occurrence of many other life events, including, for example, interpersonal conflicts and daily hassles (Mroczek et al., 1993). Optimism may also affect interpretation and reporting of such events. Indeed, a further analysis of our data regarding the 12 other life events we inquired about showed a slightly lower number of events for highly optimistic individuals. This finding raises the question whether a smaller number of life events would explain the buffering effect of optimism on sickness absence. According to our preliminary analyses, this is not the case. However, our measurement did not adequately cover the potentially important secondary events, such as financial difficulties that may have followed the death or severe illness in the family.

Distinction Between Pessimism and Optimism

We found no unambiguous support for the hypothesis that low pessimism would provide a buffer from health problems after a

major life event or that frequent pessimistic expectations would increase vulnerability to sickness absence in such situations. Pessimists have learned to distance themselves (Scheier & Carver, 1992), and this coping strategy may not be substantially less adaptive than active problem-focused coping immediately after an uncontrollable severe event such as the death of a family member (Bonanno, 2004). Instead of a moderated effect, higher pessimism was related as a main effect to a higher overall level of health problems, in line with previous findings on pessimism and hopelessness (Everson et al., 1996; Everson, Kaplan, Goldberg, Salonen & Salonen, 1997; Koivumaa-Honkanen et al., 2000, 2001; Rääkkönen et al., 1999).

Our results of the nonparallel sickness profiles between optimists and nonoptimists and between pessimists and nonpessimists underline the importance of considering optimism and pessimism as separate concepts. Relatively little is known about the specific mechanism that may explain the distinct effects of these constructs. However, at least four other findings support the possibility that thinking optimistically about the future would differ from avoiding pessimistic expectations for the future:

1. The bivariate correlation between optimism and pessimism was less than $-.40$, indicating that the scores were correlated but distinct in this sample.

2. The correlates for optimism and pessimism were not the same. For example, demographic characteristics, such as age and education, were more strongly related to pessimism than to optimism.

3. The unique protective effect of optimism on the relation between life event and sickness absence remained after controlling for the level of pessimism and the interaction between pessimism and life event. These findings suggest that the health-buffering role of optimism is independent of pessimism.

4. The level of pessimism increased after severe illness in the family, but the level of optimism remained unaffected. This is further evidence of the different roles of optimism and pessimism and also supports the hypothesized dispositional character of optimism.

The distinction between optimism and pessimism may not necessarily be relevant for all contexts or samples, as the unidimensional conceptualization of optimism–pessimism has also received substantial support (Bunn, Bosompra, Ashikaga, Flynn, & Worden, 2002; Korkeila et al., 2004; Roysamb & Strype, 2002; Scheier et al., 1994).

Limitations and Implications for Future Research

At least three potential drawbacks should be acknowledged. One limitation of the present study involves the assessment of life orientation. Our measure of optimism and pessimism comprised the original items of the well-known LOT–R measure, but responses were requested along a 4-point scale instead of the standard 5-point scale. This makes direct comparisons of the levels of optimism and pessimism between the present study and other studies with standard response formats uncertain. There is some cultural variation in life orientation (Chang, 1996), but the levels of optimism and pessimism in the Finnish population seem to differ very little from those of the U.S. populations. For example, in a recent population-based study of Finns, the mean scores were 3.7 for the total LOT–R, 3.6 for the Optimism subscale, and 2.2 for the Pessimism subscale (Korkeila et al., 2004). In a population-

based study of U.S. residents, the corresponding means were 3.6, 3.7, and 2.4, respectively (Bunn et al., 2002). Norm values were also similar in the study in which the LOT–R measure was developed, considering the measurement error involved in the scales (the total scores were between 3.4 and 3.5; Scheier et al., 1994).

However, the relationships between life orientation, major life events, and sickness absence observed in the present study can be similar in populations with different distributions of optimism than those in our data. This is because the main results were robust across different classifications of optimism and pessimism and the continuous measures of these constructs. Of particular importance is the analysis of groups that were determined relative to the scale; high optimism referred to those with a mean item score between 3 and 4 (these response options reflect the strongest agreement with items) and low optimism to those scoring between 1 and 2 on the Optimism subscale (these response options indicate the strongest disagreement with the items). Unlike the continuous and median-split dichotomized measures, such a criterion-referenced approach is independent of the distribution of responses to the Optimism scale.

A second limitation is that our sample was relatively homogeneous, consisting of White, 80% female employees working in the public sector. Although the cohort was large, the number of individuals faced with death or severe illness in the family during the follow-up was relatively small ($n = 284$). Future studies with more diverse, larger, and preferably population-based samples are needed to evaluate the generalizability of the present findings. Gender differences in the protective effect of optimism should also be explored in future analysis.

Finally, the present study analyzed sickness absence trends but shed little light on potential mechanisms that mediate the effects of life orientation on sickness absences. A change in life orientation seems an unlikely candidate for such mediation, because it was not related to postevent sickness absence. In future research, additional repeated measurements of factors related to stress, coping, social support, and health habits may help to identify mechanisms that explain why optimism reduces the risk of health problems and is associated with faster recovery after major life events.

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