Are psychological distress and number of treatments associated with positive consequences of the cancer experience?

Box 8: Negative and positive consequences of cancer

Anne: I didn’t like losing a breast, but I was more concerned with my longevity than my appearance. Unfortunately I had also complications from the surgery. I have residual numbness under my right arm and I developed lymphodema in my arm. Lymphodema is a swelling caused by an impaired lymph system. Physical therapy is helping me to control the swelling. Nevertheless, I believe that all in all things have turned out very nicely. We cannot use the word “cured” at this point and there is a chance that the cancer will come back but I try not to think of it everyday. What I do want to tell you is that after having cancer your life will never be the same again and I think my life is divided into “before” and “after”. The experience has given me strengths, I found out that I have a lot more strength than I had imagined, mentally, emotionally, and physically. I would never have believed I was capable of doing things that I’m doing now. I have a more positive outlook on life, and I don’t visualize a black, insidious cancer inside of me anymore. I still pay attention to my regular check-ups, but I don’t obsess about them anymore. I am enjoying every day day now. I know that this sounds strange but my life has taken a turn for the better since my diagnosis. I enjoy being with my family even more than before I got cancer. I try to take each day and look at it as a little more special than I used to. You kind of take your days for granted unless you’re facing a life-threatening disease of some sort, and then I think you tend to reconsider about what your priorities are. Cancer changes your outlook. I mean when my car breaks down, or I have a cold, it’s no big deal. It also helps me when I’m going through a tough time. I then think: “I survived cancer, I can do this, this is a small piece of cake.”
Introduction

Research into adjustment to cancer has focused primarily on negative psychological states, including depression, anxiety, and general distress (Epping-Jordan et al., 1999; Farber et al., 1984; Kugaya et al., 2000; Loge et al., 1997; Van’t Spijker et al., 1997). Many of these studies led to the conclusion that cancer may be understood both as an event and an ongoing process that may physically and emotionally weaken the individual. However, the number of studies on positive psychological states is growing and the findings of these studies suggest that the experience of cancer may produce a wide range of positive outcomes as well, including positive affect, increased self-esteem, and a more optimistic outlook (Curbow et al., 1993; Ferrell et al., 1997; Folkman et al., 2000a; Taylor, 1983). Counterintuitively, research has documented the fact that despite high levels of distress, patients may simultaneously experience positive feelings during the cancer process (Andrykowski et al., 1993; Ferrans, 1994; Ferrell et al., 1998). Imagine, for example, patients who feel anxious about a recurrence of their disease but at the same time feel happy because treatment turned out better than expected. This suggests that negative and positive feelings are not two extremes of a continuum but that affect may be seen as a two-dimensional construct (Folkman, 1997; Folkman & Moskowitz, 2000b; Fromm et al., 1996; Helgeson & Cohen, 1996; McGrath & Beehr, 1990; Schroovers et al., 2000).

To get a more complete picture of the process of coping with cancer and to develop effective interventions to help patients cope with the disease, it is important to consider the positive psychological consequences of cancer. Positive consequences reflect positive changes due to the cancer experience as perceived by the patient, such as positive changes in feelings, cognitions, behaviour, coping strategies, and social relationships. Below, we will (1) describe several studies that have focused on positive consequences as an outcome variable and (2) suggest that research should focus on factors that are associated with these positive consequences.

Previous research into the positive consequences of cancer

Prior studies have explored many positive consequences, such as improved interpersonal relationships, re-evaluation of prior goals, altered priorities in life, personal growth, and discovery of skills and new pursuits (Andrykowski et al., 1996; Fromm et al., 1996; O’Connor et al., 1990; Sodergren & Hyland, 2000; Taylor, 1983; Thibodeau & MacRae, 1997). For instance, Curbow et al. (1993) investigated the number and direction of bone marrow transplantation (BMT) related consequences among 135 long-term survivors of BMT. Interestingly, approximately two times more than more positive than negative consequences were reported. More
positive consequences were reported concerning social relationships and psychological aspects, whereas more negative consequences were reported regarding physical aspects of the illness. One frequently reported positive consequence (67.5% of the patients) concerned beliefs about what is important in life. In a study by Collins et al. (1990), 55 cancer patients were interviewed concerning the changes they had experienced in five life domains following diagnosis. Patients reported positive consequences concerning activities/priorities (79%) and relationships (83%). Furthermore, both positive and negative consequences were reported concerning the domains of the self, the world, and the future. At this point, we can conclude that, besides the tremendous negative effects that cancer and the accompanying treatment may have on the patient, patients also report that they feel strengthened by the cancer experience.

Correlates of positive consequences
Although little is known about which factors promote positive consequences, it has been suggested that the cancer experience, which can be considered as a great threat, may stimulate a search for meaning, which in turn may result in patients experiencing positive consequences. Based on attribution theory, Wong and Weiner (1981) proposed that negative or unexpected events challenge one’s sense of meaning. By attributing meaning to a threat such as cancer, individuals may master the situation much better than otherwise would have been possible (Baumeister, 1991). This search for meaning involves not only understanding why the event occurred, but also what its implications for one’s life are (Taylor, 1983). In fact, restoring a meaningful context in one’s life often requires finding new sources of positive self-regard and faith in oneself, as well as finding a basis for trusting the world (Baumeister, 1991). For instance, Taylor (1983) found that over half of a group of 78 breast cancer patients reported that the cancer experience had caused them to reappraise their lives. For many patients, the meaning derived from the cancer experience brought about a new attitude toward life and, for others, the meaning gained from the experience was positive self-change. In a similar vein, other studies revealed that finding meaning leads to feelings of personal and interpersonal growth (Brodsky, 1995).

Building on the idea that threat may, indirectly, lead to positive consequences, one could carry the idea further and say that the degree of threat might be important for reporting positive consequences of the cancer experience. Indeed, Fromm et al. (1996) found that positive consequences were more commonly reported by patients who had overcome greater adversity (i.e., greater threat) in surviving a BMT with a higher degree of risk than by patients who had survived a BMT risk with a lower degree of risk. Regarding severity of disease, Collins (1990) found that patients with poorer prognoses (those for whom the threat was still ongoing) showed more
positive consequences regarding self-perceptions than patients with good prognosis (those for whom the threat had subsided). In addition, Andrykowski (1996) compared breast cancer patients with women with benign breast problems. Given the possibility of disease recurrence among the breast cancer patients, it was interesting that breast cancer patients reported a greater improvement in their outlook on life, enhanced personal relationships, and deeper spiritual and religious satisfaction. Finally, Maher (1982) noted that the greater the barriers the cancer patient had to overcome, the more likely it was that they would value the outcome, believe they had survived for a reason, and perceive positive meaning. In sum, these findings seem to suggest that greater threat may lead to more positive consequences being experienced, probably as a result of a greater search for meaning (Baumeister, 1991).

In the aforementioned studies, threat was defined as the cancer experience itself or in terms of illness severity, with a greater illness severity indicating more threat. One might argue that these studies focused on objective threat because patients may vary in the extent to which they appraise the cancer event as threatening. The diagnosis of cancer is an objective threat, which is appraised by some patients as a harm, by others as a threat, and by still others as a challenge (Folkman et al., 2000a; Lazarus & Folkman, 1984). This means that, at best, a moderate relationship between the objective threat and the perceived threat can be expected. Patients’ psychological distress in the acute phase of the illness could be seen as a proxy for perceived threat, because patients high in distress appraise their current situation as stressful.

Given the assumption that, through the appraisal and coping processes, objective threat and perceived threat are only moderately correlated, we investigated both in our study. In the present study, we first explored longitudinally the role of both objective (i.e., illness severity in terms of number of treatments) and perceived threat (i.e., psychological distress) among a homogenous group of breast cancer patients in order to find out more about the influence of prospective external and internal correlates of positive consequences. A possible interaction effect between objective and perceived threat was also explored.

**Method**

**Subjects and procedure**

Over a period of 16 months, a consecutive series of newly diagnosed cancer patients, who received external radiation therapy with a curative intent for between four and seven weeks, were recruited from three centres for radiation therapy in the northern part of the Netherlands. The eligibility criteria required that patients: (a) be 18 years
of age or older; (b) receive outpatient treatment for cancer of the breast, prostate, cervix, or head and neck; (c) not participate in concurrent psycho-oncological studies; (d) have a basic knowledge of the Dutch language; (e) not suffer from other chronic diseases. A letter containing information about the research project and an informed consent form was attached to the patients’ medical status and patients were approached for participation in the study by their physicians. Of 321 eligible patients, 228 agreed to participate in the study (71% response rate). The main reasons for non-response were not being interested (12%), unwillingness to participate because patients felt it was too burdensome (6%), or a poor physical or psychological condition (3%).

All patients completed questionnaires at home at three stages: one week prior to the beginning of radiation therapy (T1), two weeks after radiation therapy (T2), and three months after radiation therapy (T3). For the current study we only used the data of T1 and T3. During the course of the study, 13 patients ceased to participate because they were no longer interested (N = 8), felt it was too much of a burden (N = 2), moved out of the country (N = 1), died (N = 1), or were diagnosed with another illness (N = 1). An additional six patients were excluded from the analyses due to incomplete data on the variables we used for the present study. Thus, a total of 209 patients completed both the initial and follow-up assessments.

Because, to our knowledge, the present study is the first to explore the association between objective and perceived threat, on the one hand, and positive consequences, on the other hand, we believed that a homogeneous group of breast cancer patients would be a more valid sample to examine. In addition, objective threat was explored by focusing on the number of treatments. Since the number of treatments is dependent on tumor site, and, therefore, also on gender, we chose to maintain tumor site and gender steady. The selection of breast cancer patients resulted in a final sample of 109 patients.

**Measures**

*Baseline measures.*

In the current study, **objective threat** was measured using the **number of treatments** that patients would receive. Thus, the higher the number of treatments, the higher the objective threat. We preferred to measure number of treatments instead of, for instance, stage of disease, because our interviews with different patients revealed that patients do not always know in what stage of disease they find themselves (e.g., Stage I or Stage II). However, they do know what treatments they will receive. The number of treatments was obtained by examining the medical status of each patient. All patients had undergone an operation and would receive radiotherapy. Those
breast cancer patients who would receive additional chemo- or hormonal therapy were allocated to another group. Thus, patients were divided into two groups dependent on which treatments they were about to receive.

Perceived threat was defined as the level of psychological distress and measured using two sub-scales of the RAND-36: psychological functioning (5 items) and vitality (4 items) (Van der Zee et al., 1996). Patients were asked how they had felt in the past four weeks. Two sample items from the subscale psychological functioning are "I felt happy" and "I felt depressed and sad." Two sample items from the subscale vitality are "I felt lively" and "I felt tired". Possible responses were given on a 6-point scale ranging from 1 “all the time” to 6 “never”. Scale scores on the RAND-36 were derived by summing the items together within a scale, dividing by the range of scores, and then transforming raw scores to a 0 to 100 scale. Higher scores in each scale indicate better functioning. Chronbach’s alpha for psychological functioning was .85 and for vitality .83.

Outcome measures.
To assess positive consequences at T3, we employed the Silver Lining Questionnaire (SLQ), which consists of 38 items that are intended to measure positive experiences of illness. The items were generated following a thematic analysis of accounts provided by 68 individuals (Sodergren & Hyland, 2000). The questionnaire is designed to be completed by the patient and is applicable to all illness types. Two sample items from this questionnaire are "My illness has helped me to find myself” and “My illness strengthened my relationships with others”. Possible responses were given on a 5-point scale ranging from 1 “strongly disagree” to 5 “strongly agree” with a higher score on the scale indicating more positive consequences perceived from the illness (Sodergren & Hyland, 2000). A total score is derived by the summation of values for each item. The score ranges between 38 and 190. Chronbach’s alpha for this scale was very high (a = .95).

Data-analytic approach for hierarchical regression analyses
A series of hierarchical multiple-regression equations were calculated to examine the predictive value of objective and perceived threat on positive consequences. First, demographics were tested for inclusion as control variables. With the exception of age, the demographic variables were not associated with the dependent or with the independent variables. A lower age was associated with lower psychological functioning, with a greater number of treatments, and with more positive consequences. Therefore, age was included as a control variable in the
analyses. Separate regression analyses were performed for psychological functioning and vitality.

After controlling for age, one of the perceived threats (i.e., psychological functioning or vitality) and the objective threat (dummy score: 1 = higher number of treatments, -1 = lower number of treatments) were entered in the second step of the regression analyses. The cross-product of psychological distress (i.e., either psychological functioning or vitality) and number of treatments was then entered in the third step. Thus, we performed 2 analyses. To avoid multicollinearity among predictors and the interaction term, the multiplicative functions were computed after the scores on the perceived threats were centered around zero (i.e., raw-score – mean-score) (Aiken & West, 1991). Significant interactions were plotted to interpret the effects of the research questions. More specifically, as suggested by Aiken and West (1991), we calculated the regression slopes for the group with a lower number of treatments and for the group with a higher number of treatments, separately.

Results

Descriptives

Table 1 presents the socio-demographic and medical characteristics of the patients. The majority of the sample had a lower level of education and lived with a partner. Ages ranged from 31 to 77 years. With respect to the medical characteristics, the time elapsed since diagnosis ranged from one to nine months, with an average of eight weeks. The largest single diagnostic group comprised women with breast cancer (57%), followed by prostate (28%), head and neck (8%), and cervical (7%) tumors. The majority was diagnosed with a Stage I or II and most patients received radiotherapy as their only primary therapy or radiotherapy in combination with surgery or breast conserving therapy.

Interrelations between the study variables

Pearson’s correlation coefficients were computed to examine the associations among the socio-demographic factors, psychological functioning and vitality at T1, number of treatments, and positive consequences at T3 (see Table 2).

Significant relationships were found between the socio-demographic variables and psychological functioning, number of treatments, and positive consequences. Younger patients were significantly higher educated ($r = -0.47$) and more psychologically distressed ($r = 0.20$) than older patients. In addition, younger patients received a significantly higher number of treatments ($r = .33$) and reported more positive consequences of their illness ($r = -0.21$).
Table 1. Descriptive characteristics of the patient group (N=109) in numbers and percentages

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-64</td>
<td>78</td>
<td>72</td>
</tr>
<tr>
<td>&gt; 65</td>
<td>31</td>
<td>28</td>
</tr>
<tr>
<td>Mean</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>31-77</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partner</td>
<td>86</td>
<td>79</td>
</tr>
<tr>
<td>No partner</td>
<td>23</td>
<td>21</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary schooling</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>Lower secondary schooling</td>
<td>58</td>
<td>54</td>
</tr>
<tr>
<td>Middle secondary schooling</td>
<td>20</td>
<td>19</td>
</tr>
<tr>
<td>Higher secondary schooling</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>Number of treatments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low: breast conserving/ surgery &amp; radiotherapy</td>
<td>68</td>
<td>62</td>
</tr>
<tr>
<td>High: breast conserving/ surgery &amp; radiotherapy &amp; chemotherapy or hormonal therapy</td>
<td>41</td>
<td>38</td>
</tr>
</tbody>
</table>

Note. Because there are some missing values N varies over different variables

As expected, a strong correlation was found \((r = 0.60)\) with respect to the relationship between psychological functioning and vitality. Important for the current study, the relationship between objective threat (i.e., number of treatments) and perceived threat (i.e., psychological functioning and vitality) was not significant, which supports our assumption.

Predicting positive consequences
Two regressions were done to examine the role of objective and perceived threat in predicting positive consequences. The results of the regression analyses are presented in Table 3. In neither of the analyses did we find significant main effects of objective or perceived threat on positive consequences. This indicates that objective and perceived threat did not independently predict positive consequences. However, significant interactions were found. The interactions between psychological functioning and vitality, on the one hand, and objective threat, on the other hand, contributed significantly to the positive consequences. The significant
Table 2. Means, standard deviations, and intercorrelations for the variables under study (N=109)

<table>
<thead>
<tr>
<th>Variable</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td>-.47***</td>
<td>.20*</td>
<td>.14</td>
<td>.33**</td>
<td>-.21*</td>
<td>56.16</td>
<td>11.74</td>
</tr>
<tr>
<td>2. Education†</td>
<td>-</td>
<td>-.10</td>
<td>.07</td>
<td>.01</td>
<td>.10</td>
<td>2.31</td>
<td>.87</td>
</tr>
<tr>
<td>3. Psychological functioning</td>
<td>-</td>
<td></td>
<td>.60***</td>
<td>-.13</td>
<td>-.15</td>
<td>69.39</td>
<td>15.50</td>
</tr>
<tr>
<td>4. Vitality</td>
<td>-</td>
<td>-.10</td>
<td>-.10</td>
<td>57.20</td>
<td>18.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Number of treatments²</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td>1.62</td>
<td>.49</td>
<td></td>
</tr>
<tr>
<td>6. Positive consequences</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>109.83</td>
<td>24.48</td>
</tr>
</tbody>
</table>

Note. *** p <0.001; ** p < 0.01; * p < 0.05.
2. Scales for number of treatments: 1: higher number of treatments; 2: lower number of treatments.

As can be seen in the figures, the shapes of both these interactions were similar. Interestingly, it seemed that patients with only one threat (either a high objective or a high perceived threat) reported the highest level of positive consequences. Furthermore, patients with the lowest degree of threat (i.e., higher psychological functioning or higher levels of vitality and lower number of treatments) and patients with the highest degree of threat (i.e., lower psychological functioning or vitality and higher number of treatments) reported the lowest levels of positive consequences. In conclusion, being high on objective but low on perceived threat or being low on objective but high on perceived threat was most strongly associated with positive consequences.

† We also assessed stage of disease (Stage I versus Stages II and III) as an indicator of objective threat. The results revealed similar interaction effects to the ones we found by using number of treatments as an objective threat. Psychological distress and vitality in combination with stage of disease was predictive of positive consequences. In addition, figures revealed similar shapes.
Table 3. Multiple regression analyses of positive consequences on objective and perceived threat (N=109)

<table>
<thead>
<tr>
<th></th>
<th>Positive consequences</th>
<th>( R^2 )</th>
<th>( F )</th>
<th>( B )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Psychological functioning analysis</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 1: Age</td>
<td>.04</td>
<td>4.34*</td>
<td>-.33</td>
<td></td>
</tr>
<tr>
<td>Step 2: Psychological functioning (PF)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of treatments (NT)</td>
<td>.02</td>
<td>.69</td>
<td>1.19</td>
<td></td>
</tr>
<tr>
<td>Step 2: PF x NT</td>
<td>.07</td>
<td>8.26**</td>
<td>.53</td>
<td></td>
</tr>
<tr>
<td><strong>Vitality analysis</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 1: Age</td>
<td>.04</td>
<td>4.34*</td>
<td>-.38</td>
<td></td>
</tr>
<tr>
<td>Step 2: Vitality (V)</td>
<td></td>
<td></td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>NT</td>
<td>.01</td>
<td>.34</td>
<td>.92</td>
<td></td>
</tr>
<tr>
<td>Step 2: V x NT</td>
<td>.12</td>
<td>9.00**</td>
<td>.44</td>
<td></td>
</tr>
</tbody>
</table>

Note. \( B \) = the unstandardized regression coefficient, ** \( p < 0.01; * p < 0.05. \)

**Discussion**

This study was the first to examine the association between both objective and perceived threat prior to the first treatment with radiotherapy and the experience of positive consequences of illness at three months after completion of radiotherapy. Our findings seem to suggest that the highest levels of positive consequences are reported by patients with a high objective but a low perceived threat and by patients with a low objective but a high perceived threat.

The present study also revealed that patients with the lowest level of threat prior to treatment with radiotherapy reported relatively few positive consequences at three months after completing radiotherapy. These patients, who were low on psychological distress or high in vitality and who received only radiotherapy, were probably less motivated to seek meaning in their illness. In addition, the illness may have caused fewer changes in their lives and, therefore, would be seen as relatively less life-altering. It is, therefore, not surprising that patients with either a high objective or a high perceived threat reported more positive consequences than patients who experienced low levels of both threats. For these patients, a greater degree of threat may have stimulated a greater search for meaning that, in turn, may
Figure 1. The interactive effect of objective and perceived threat (i.e., psychological functioning) on positive consequences.

![Graph showing the interactive effect of objective and perceived threat on positive consequences.]

Figure 2. The interactive effect of objective and perceived threat (i.e., vitality) on positive consequences.

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![Graph showing the interactive effect of objective and perceived threat on positive consequences.]

have led to more positive consequences. They were probably more likely than patients who experienced low levels of both threats to experience their illness as a transitional event, which served as a stimulus for positive consequences.

Remarkably, patients who experienced the greatest degree of threat (i.e., higher objective and higher perceived threat) reported fewer positive consequences of their illness than patients who experienced high levels of either objective or perceived threat. These results seem to suggest that the additional impact of extensive treatments (extra chemo- or hormonal therapy) on patients who were already high on psychological distress or low in vitality, made it especially difficult for these patients to search for positive meaning or to view their illness positively. It is also possible that hearing that they would receive additional chemo- or hormonal therapy, increased the psychological distress of these patients and, consequently, led to less positive consequences. Hence, the combination was too much for patients to be able to report positive consequences several months after the final treatment.

Time of measurement may also be a reason for our finding that patients with the highest degree of threat (i.e., those high in objective and perceived threat) did not report the highest incidence of positive consequences. Patients with the highest degree of threat possibly needed more time to report positive consequences, because they were not able to see the positive aspects of their illness, were still coping, and needed more time to search for meaning. Consequently, a later assessment point could have led to higher levels of positive consequences for patients with the highest degree of threat. This argument is consistent with the findings of Baumeister (1991), who stated that, if the threats can be dealt with in a way that satisfies the need for meaning, then coping will be successful and the distress can be brought to an end. It is also somewhat consistent with the findings of Folkman (1997) and her study of bereavement. This study revealed that the partners of men with AIDS had the ability to achieve positive states of mind including recognizing positive consequences, with the exception of the period immediately surrounding the partner’s death, which was associated with lowered scores on positive psychological states.

Our results are somewhat consistent with the findings of previous studies described in the Introduction. These studies revealed that patients who experience a great threat also experience more positive consequences (Andrykowski et al., 1993; Andrykowski et al., 1996; Fromm et al., 1996; Maher, 1982). However, we add to these findings in two ways. First, our study had a longitudinal design, indicating that threat at an earlier point in time (one week prior to beginning first treatment) is associated with positive consequences at a later point in time (about five months later). Second, we suggest that the combination of objective and perceived threat is important for perceiving positive consequences. These results are in some way consistent with Ruch et al. (1980), who examined the influence of prior life change on the emotional trauma experienced by women rape victims. They found a curvilinear relationship indicating that women who had experienced a moderate
level of recent life change were less vulnerable than women who had experienced either no changes or many changes. They argued that life crises may ultimately be beneficial when they are relatively manageable and provide one with an opportunity to learn new coping skills. Based on other earlier research which asserted a curvilinear relationship (n-shape) between arousal and task performance with optimal performance occurring at some moderate level of arousal or motivation (Yerkes-Dodson law), we could argue that the same principle could account for the present findings. Substituting the level of threat for arousal and positive consequences for task performance, positive consequences would reach an optimal level at some moderate level of threat. Although this argument is plausible, we would like to stress the importance of future research to test this assumption (Weiman, 1977).

As discussed in the Introduction, searching for meaning may be a possible explanation for the present findings. The negative psychological states may have motivated patients to search for and create positive meaning in order to find positive consequences of their illness. One could plead that the process of finding positive meaning and reporting positive consequences is actually a coping process. Indeed, Folkman (1997) indicated that coping is associated with positive psychological states, including experiencing positive consequences. In her study on bereavement, positive reappraisal (cognitive strategies for reframing a situation in a positive light) was considered a coping process with an underlying theme: searching for positive meaning. According to Baumeister, “full-fledged coping requires finding new meanings” (page 266, Baumeister, 1991).

**Limitations and future research**

The present study is limited in that we can only suggest that searching for positive meaning is a coping strategy that may lead to the recognition of positive consequences. Our findings do not show clear evidence for these suggestions because we did not assess meaning in the present study. However, our result points out that, as a consequence of the existence and nature of threat, differential patterns are induced which lead to the recognition of positive consequences at a later point in time. Because we found these outcomes over time and not cross-sectional at T3, such a process seems likely. Another limitation is that the patient group consisted of patients with breast cancer who had a relatively favorable prognosis. As the patient group in the present study may not have been representative of all patients with breast cancer, we have to be especially careful in drawing conclusions. It would be interesting if future research would also include patients with a poor prognosis in combination with perceived threat (i.e., psychological functioning).

Notwithstanding the limitations of the present study, the findings deserve consideration. They do provide some genuine and very interesting insights into factors that are associated with positive consequences. Because this study is the first
longitudinal study on positive consequences, we would like to emphasize that the
results are preliminary. Our study needs replication but also highlights the need to
know more about the positive consequences of illness and the coping process behind
them.

Future research could build on the present study in several ways. First, it would
be interesting to know whether other studies will find the same interactive effect
between objective and perceived threat on the recognition of positive consequences
by patients, indicating that when the level of threat is too high, patients may not
report the highest level of positive consequences. Second, time of assessment could
play a role in the current findings. Future research should also assess the duration of
threat and include multiple assessments of positive consequences.

To conclude, although our findings are preliminary and should be interpreted
with some caution, one could start by integrating our findings into practice by
providing intervention programs. These interventions should be aimed at reinforcing
a search for positive meaning by focusing on cognitive beliefs or appraisals that, in
turn, may positively influence thoughts about the self. Patients could, for instance,
be taught to realize that they are good “copers” because they survived cancer.
Focusing on this issue, instead of focusing only on the negative long-term effects of
cancer and cancer treatments, may stimulate patients to concentrate on the beneficial
aspects of their illness experiences.

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experience?