Social comparison and coping with radiation therapy
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Chapter 4

Uncertainty and social comparison: Do uncertain cancer patients react differently to different kinds of social comparison information?

Abstract

The present study examined the effects of three different kinds of social comparison information using a control group for comparison. Cancer patients were provided with audiotaped social comparison information just prior to undergoing radiation therapy. On the procedural tape, a male and female patient discussed their illness and radiation therapy; on the emotion tape, they focused on emotional reactions; and on the coping tape, they focused on the way they had been coping. More specifically, it was examined whether uncertainty about cancer and radiation therapy influenced the effects of these different kinds of social comparison information. The results indicated that those high in uncertainty seem to benefit the most from the coping tape, and not the procedural tape. These results remain evident even when controlling for the effects of personality characteristics such as social comparison orientation, and neuroticism.

‘One of the most striking features of the journey from health to illness and back again is the nearly constant presence of uncertainty’ (Sanders, 1982, p. 129).

Illness is generally accompanied by uncertainty. This may be particularly the case with a life-threatening disease such as cancer, with its uncertain treatment efficacy, unknown consequences for daily activities, diverse side effects, and the possibility of recurrence (Christman, 1990). Van den Borne and Pruyn (1985) indicated that uncertainty (i.e., lack of information) is one of the major psychological problems among cancer patients. Indeed, cancer patients undergoing radiation therapy report a high need for information, especially regarding the disease itself, the prognosis, tests and treatment(s), as well as for information regarding physical care and how to deal with their feelings and concerns (Bilodeau & Degner, 1996; Galloway, et al., 1997; Graydon, et al., 1997; Harrison-Woermke & Graydon, 1993). Patients have many questions, often without clear answers. Information from fellow patients (e.g., how they are doing, feeling, and coping) may help in answering these questions.

The notion that information about fellow patients could be advantageous to patients’ well-being can be traced back to Festinger’s social comparison theory (1954). Festinger (1950, 1954) hypothesized that when people experience a shortage of objective (i.e., non-social) information, they will try to accurately evaluate their opinions and abilities by comparing themselves with similar others. In several studies it was found that individuals high in uncertainty indeed appear to have a high need for social comparison information. In a study among patients with various forms of cancer, Molleman, Pruyn & Van Knippenberg (1986) found that,
the more uncertainty the patients experienced, the more they considered fellow patients to be informative. Similarly, Van den Borne and Pruyn (1985) found that uncertainty was the most important predictor of the need for social comparison among cancer patients. The more uncertainty cancer patients felt about their illness, the more they wanted to know how fellow patients reacted to their illness. A study by Kulik and Mahler (1989) demonstrated that patients who were anticipating coronary-bypass surgery preferred to have a roommate who had already undergone the surgery to a roommate who was awaiting the same surgery. These so-called postoperative roommates were preferred mainly because they could provide valuable information about the impending surgery. Furthermore, among a sample of individuals falling under the Disablement Insurance Act, Buunk (1995) found that, the desire to seek out the company of similar others and to learn more about such others was particularly fostered by uncertainty.

Although it is generally acknowledged that uncertainty fosters the need for social comparison, limited attention has been paid to the role of uncertainty in moderating the effects of social comparison. One would expect that those high in uncertainty (who report a high need for social comparison information) would respond differently to social comparison information than those low in uncertainty. In the present study, the role of uncertainty (i.e., the lack of knowledge about cancer and radiation therapy) in moderating the effects of social comparison information on mood was examined. More specifically, it was examined whether cancer patients high in uncertainty would respond differently to different types of social comparison information. Cancer patients who were about to undergo radiation therapy were provided with one of three types of audiotaped social comparison information. On each of the three tapes, individuals who acted as cancer patients who had already undergone radiation therapy recounted their experiences with cancer and radiation therapy. However, on each audiotape they focused on different aspects. On the first tape, they focused on the procedural aspects of the experience (procedural tape); on the second tape, they focused on the emotional aspects (emotion tape); and on the third tape, they focused on coping aspects (coping tape).

**Procedural tape**

On the procedural tape, the patients focused on their experiences with various aspects radiation therapy: how the cancer was discovered, what happened during the treatments, which side effects they experienced, and the check-ups after the radiation therapy had ended. Interventions to prepare patients for radiation therapy have been effective in increasing knowledge about radiation therapy, reducing anxiety, and reducing disruptions of daily activities (see Ream & Richardson, 1996, for a review). Information about radiation therapy enables patients to have a better idea of what to expect. Information about experiences
from fellow patients can be an important supplement here, as it provides cancer patients with the opportunity to compare themselves and their situation with (the situation of) fellow patients. Kulik and Mahler (2000) have suggested that, when people are faced with a novel (health) threat, they experience an increased desire for social comparison information relevant to that threat. Kulik and Mahler further hypothesized that people are likely to choose comparison others primarily for their ability to reduce uncertainty (e.g., provide cognitive clarity) about the threat situation, and to a lesser extent for their comparison potential. In other words, cancer patients will use information about fellow patients who have already undergone the radiation therapy first of all to get a better idea of what to expect, and to a lesser extent as an opportunity to compare themselves or their situation.

**Emotion tape**

Even though every individual reacts differently to having cancer and being treated for it, fellow patients who have already undergone the treatment are able to provide information about what kind of emotions they experienced during radiation therapy, thus providing a point of reference. Research has indicated that uncertainty about emotions can promote the need for social comparison (Cottrell & Eppley, 1977; Kulik & Mahler, 2000). However, little attention has been given to the specific consequences of comparing one’s emotions with those of similar others when facing a serious health threat. Spiegel and Diamond (2001) suggested that cancer patients who are uncertain about their emotional responses, may learn from fellow patients that they reacted quite normally to the situation. Information from fellow patients about their emotional reaction can thus normalize and validate patients' emotions. On the emotion tape, the patients, therefore, focused on their emotional reactions to cancer and radiation therapy.

**Coping tape**

On the coping tape, the patients focused on how they had coped with various aspects of cancer and radiation therapy. Presenting patients with a positive coping model may increase their self-efficacy and their ability to cope with the situation. Self-efficacy refers here to the personal judgments of how well one can implement behavior to cope with one's disease and treatment (Bandura, 1986). Models of positive coping with cancer and the radiation therapy provide an opportunity for upward social comparison. By comparing with similar others who are coping well, patients may learn how to improve their own situation (Berger, 1977; Telch & Telch, 1985), and, at the same time, they may acquire hope and motivation (Taylor & Lobel, 1989). Indeed, studies indicate that people facing a health threat are particularly interested in information about fellow patients who were coping very well (Bennenbroek, Buunk, Van der Zee & Grol, 2001; Buunk,
1995). It seems that comparison on the coping dimension is motivated by a desire to improve oneself. After all, fellow patients who are coping well can provide more useful information on how to improve one’s own situation than fellow patients who are better off physically.

**The role of personality characteristics**

It is not unlikely that the role of uncertainty in moderating the effects of social comparison information may actually be attributed to personality characteristics related to uncertainty. Therefore, it was examined whether the influence of uncertainty on the effects of the social comparison information would remain intact even when taking personality characteristics into account. In other words, it was examined whether the influence of uncertainty could actually be attributed to feelings of uncertainty, and not, for example, to a common factor behind uncertainty and a specific personality characteristic, such as social comparison orientation and neuroticism. Although little is known about the role of uncertainty in moderating the effects of social comparison information on mood, the role of dispositional factors related to uncertainty, such as social comparison orientation and neuroticism, is more established.

An increasing number of studies focus on the role of social comparison orientation in social comparison processes. Gibbons and Buunk (1999) introduced this notion of social comparison orientation to refer to the disposition of individuals who are strongly focused on social comparison, are particularly sensitive to their own standing relative to others, and who are interested in information about the thoughts and behaviors of others in similar situations. Furthermore, individuals high in social comparison orientation are characterized by a heightened uncertainty about themselves, accompanied by a relatively strong dependency on other people for their self-evaluation. A study among cancer patients (Van der Zee, *et al.*, 1998) showed that patients high in social comparison orientation were indeed more inclined to select and attend to information about fellow patients. In addition, people high in social comparison orientation tend to be more strongly affected by social comparisons (Gibbons & Buunk, 1999).

Neuroticism has also been found to moderate the affective responses of cancer patients to social comparison information (e.g., Van der Zee, *et al.*, 1998; Van der Zee, Olderma, *et al.*, 1998). Neuroticism is a personality trait characterized by a tendency to experience negative, distressing emotions and to possess associated behavioral and cognitive traits. Features that define this trait are fearfulness, irritability, low self-esteem, social anxiety, poor inhibition of impulses, and helplessness (Costa & McCrae, 1987). Neuroticism is also associated with an information processing style that is harmful to the self (Young & Martin, 1981). That is, when confronted with information about fellow patients, individuals high in neuroticism tend to focus on the negative implications of such information.
**Specification of research issues**

In the present study, the role of uncertainty in moderating the effects of the audiotapes on mood was examined. It was expected that those experiencing high uncertainty would respond most favorably to the procedural tape. This tape provides procedural and sensory information about cancer and radiation therapy, and was expected to provide the most relevant information for reducing uncertainty about cancer and radiation therapy. Therefore, it was expected that this tape would be able to fulfill the need for information the best. Furthermore, it was examined whether the influence of uncertainty in moderating the effects of the social comparison information would remain evident even when taking relevant personality characteristics into account.

**Method**

**Procedure**

Patients were approached in the three hospitals with radiation therapy departments in the northern part of the Netherlands. In each department, an assistant would check incoming patient files to see whether patients met the inclusion criteria. The patients had to be newly diagnosed cancer patients with breast cancer, cervical cancer, head and neck cancer, or prostate cancer. They had to be treated with external radiation therapy with curative intent for a period of four to seven weeks. They could not be participating in another psycho-oncological study and had to have sufficient knowledge of the Dutch language.

Once it was determined that a patient met the inclusion criteria, (s)he was approached by his/her radiation oncologist with a request to participate in the study. The patients were given written information about the study, which they could read in their own time. They could then send an informed consent form to the researchers, indicating that they would participate in the study. Of the 319 eligible patients, 226 agreed to participate in the study (71% response rate). The main reasons for non-response were not being interested (12%), feeling it was too burdensome (6%), or a poor physical or mental condition (3%). Next, patients were randomly assigned to one of the three experimental conditions, each with a different audiotape, or to the control group. Patients assigned to an experimental condition who did not own a tape recorder were provided with one. In the week prior to the start of their treatment, the patients received the questionnaire and an audiotape.

**Sample**

The majority of the respondents was female (65%). Their ages ranged between 29 and 81 years of age \(M = 60\). The sample consisted of patients who were treated for breast cancer \(N = 131\), prostate cancer \(N = 61\), cervical cancer \(N = 17\), and head and/or neck tumors \(N = 17\). About 36% of the patients had primary...
education or lower professional training, 49% had high school education or middle professional training, and 15% had a higher education or higher professional training. All patients were about to undergo radiation therapy. In addition, 53% of the patients had received or were receiving a secondary treatment; 46% surgery, 23% chemotherapy, and 31% other secondary treatment. The elapsed time since first diagnosis varied between 1 and 36 weeks, with an average of eight weeks.

**Development of the audiotapes**

A total of 20 cancer patients were interviewed in order to gather the necessary information for developing the audiotapes. These patients were either still undergoing radiation therapy or had recently received their last treatment. The scripts of the audiotapes were based on information extracted from these interviews, information from medical staff, and information from relevant literature. The scripts of the audiotapes represented an interview in which one male patient and one female patient who have already undergone radiation treatment are recounting their experiences.

Before the audiotapes were recorded, radiation oncologists and a number of cancer patients reviewed the scripts. On the basis of their comments and recommendations, some small alterations were made to the scripts. Next, the audiotapes were recorded with the help of professional actors, a director, and a sound technician. After recording, the audiotapes were once again reviewed and approved by the medical staff of all three hospitals involved in the present study.

**Similarities and differences in the audiotapes**

Each script was written to match the other scripts as much as possible on the subjects which were addressed, the order of the subjects, the use of language, and total length of the audiotape. The main subjects that were addressed on all the audiotapes were the way the diagnosis was made, the radiation treatment, the possible side effects of the treatment, and the changes after the treatment had ended. However, the audiotapes differed in the way these topics were addressed, as each audiotape focused on a different dimension. The audiotapes were roughly 25 minutes long.

**Instruments**

In the week prior to the start of their radiation treatments, patients received a questionnaire with several different sections.

Uncertainty was measured using a scale of six items. For example, ‘I feel that I don’t know enough about my disease and its treatment’ and ‘I am uncertain about what to think of my illness and the effects of the treatment’. This scale is based on a scale developed by Van den Borne and Pruyn (1985) to measure the
information needs among cancer patients and a scale developed by Buunk (1994) to measure internal feelings of uncertainty. The scale has previously been used in other studies examining uncertainty among cancer patients with satisfactory reliabilities (e.g., Bennenbroek, Buunk, Van der Zee & Grol, 2002; Van der Zee, Buunk, Sanderman, Botke & Van den Berg, 1999). Answers were given on a 5-point scale from 1 = not at all applicable to 5 = very much applicable. Cronbach’s alpha for the scale was $\alpha = .74$.

Individual differences in social comparison orientation were measured using the Iowa-Netherlands Comparison Orientation Measure (INCOM; Gibbons & Buunk, 1999). Participants could answer on a 5-point scale whether they agreed with statements on social comparison habits, ranging from 1 = I disagree strongly to 5 = I agree strongly. For example: ‘I always like to know what others in a similar situation would do’. The reversed items (‘I am not the type of person who compares often with others’ and ‘I never consider my situation in life relative to that of other people’) were removed from the analyses, because of very low item-total correlations ($r = -.006$ and $r = .159$, respectively). Cronbach’s alpha for the resulting scale was $\alpha = .83$.

Neuroticism was measured using a 12-item subscale from the 48-item version of the Eysenck’s Personality Questionnaire (EPQ; Eysenck & Eysenck, 1991; Sanderman, et al., 1995). For each item the participants had to respond with ‘Yes’ or ‘No’ to a personality describing statement. For example: ‘Does your mood often go up and down?’. Cronbach’s alpha for this scale was $\alpha = .81$.

After listening to the audiotape, a manipulation check was performed to examine the extent to which patients had compared themselves with the patients on the tape. The patients were asked to indicate whether or not they had compared themselves and/or their situation to the (situation of) the fellow patients on the tape. They could respond with ‘No’, ‘Yes, I compared myself with the man on the tape’, ‘Yes, I compared myself with the woman on the tape’, or ‘Yes, I compared myself with the man and the woman on the tape’.

Mood was measured using a shortened version of the Profile of Mood States (V-POMS; McNair, Lorr, & Doppelman, 1971; Wald, & Mellenbergh, 1990). This questionnaire contains 32 adjectives describing different mood states. The participants were asked to indicate how much the description applied to their mood over the past several days on a 5-point scale (1 = not at all applicable to 5 = very much applicable). To construct the total scale of negative mood, the ‘vigor’ items were reversed, so that a higher score indicated a more negative mood. Cronbach’s alpha for the complete scale was high, $\alpha = .94$. 

Table 1
Summary of regression analysis of uncertainty and the dummy variables D1 (coping vs. control), D2 (emotion vs. control), and D3 (procedural vs. control), predicting negative mood

<table>
<thead>
<tr>
<th>Step 1</th>
<th>( R^2 ) change</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncertainty</td>
<td>.19***</td>
<td>6.96***</td>
</tr>
<tr>
<td>D1</td>
<td>-1.16</td>
<td></td>
</tr>
<tr>
<td>D2</td>
<td>5.67†</td>
<td></td>
</tr>
<tr>
<td>D3</td>
<td>-1.44</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2</th>
<th>( R^2 ) change</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncertainty x D1</td>
<td>-8.65**</td>
<td></td>
</tr>
<tr>
<td>Uncertainty x D2</td>
<td>-.33</td>
<td></td>
</tr>
<tr>
<td>Uncertainty x D3</td>
<td>-4.65</td>
<td></td>
</tr>
</tbody>
</table>

*** p < .001, ** p < .01, p < .05, † p < .10

Results

Extent of comparison
To examine the extent to which the patients had compared themselves with the fellow patients on the tapes, a manipulation check was used. Results show that 93% of the patients who had received the procedural tape had indeed compared themselves with the patients on the tape, while this percentage was slightly lower among those who had received the coping and emotion tape (79% and 82%, respectively).

Uncertainty
In the main analyses, the moderating role of uncertainty about cancer and radiation therapy on the effects of the audiotapes on mood was examined. To examine these effects, multiple regression analyses were used. In the first step, uncertainty and the dummy variables concerning the experimental condition were entered (i.e., the following contrasts: emotion vs. control, procedural vs. control, and coping vs. control). In the second step, the interaction terms of uncertainty and the dummy variables were entered (see Aiken & West, 1991). Additional regression analyses were performed to examine the other possible contrasts between conditions (emotion vs. coping, emotion vs. procedural, and procedural...
First, the regression analysis revealed a main effect of uncertainty (see Table 1). Not surprisingly, those patients who reported a higher uncertainty reported a more negative mood, $B = 6.96, p < .001$. The analysis also revealed a marginally significant main effect of the emotion tape. Those who had listened to the emotion tape reported a more negative mood than the patients in the control group. Furthermore, a significant interaction effect was found (see Figure 1). Uncertainty influenced the effect of the coping tape in comparison to the control group on negative mood. Additional analyses, which examined the other possible contrasts (emotion vs. coping, emotion vs. procedural, and procedural vs. coping) revealed an additional significant interaction. Uncertainty influenced the effect of the coping tape in comparison to the emotion tape on negative mood, $B = 8.35, p < .01$. Furthermore, the simple slopes of the three different audiotapes and the control group were tested. The analyses revealed that the slopes were significant for the procedural tape, $B = 5.23, p < .05$, the emotion tape, $B = 9.52, p < .001$, and vs. coping), and to obtain the slopes of all four conditions (Aiken & West, 1991). To facilitate interpretation of the results, uncertainty was standardized (Aiken & West, 1991).
for the control group, $B = 9.87, p < .001$. The slope for the coping tape, $B = 1.21, ns$, was not significant. In other words, with increasing levels of uncertainty, more negative mood was reported by all patients, except by the patients who had listened to the coping tape. More importantly, post-hoc analysis (Aiken & West, 1991) revealed that among those high in uncertainty, those who listened to the coping tape reported significantly less negative mood than those in the control group, $B = -16.15, p < .001$, and than those who had listened to the emotion tape, $B = -11.60, p < .05$. Thus, in contrast to expectations, those high in uncertainty did not respond best to the procedural tape, but to the coping tape. Among the patients low in uncertainty, no significant differences between conditions were found.

**Personality characteristics**

Next, it was examined whether the influence of uncertainty would hold up when controlling for personality characteristics, such as social comparison orientation and neuroticism. First, the correlations between uncertainty and these personality characteristics were examined. Social comparison orientation and neuroticism both correlated significantly with uncertainty ($r = .36, p < .001$ and $r = .37, p < .001$, respectively). Similar regression analyses were used to examine whether the effects of uncertainty would hold up, even when controlling for the personality characteristics. Therefore, social comparison orientation or neuroticism was entered in the first step. In the second step, uncertainty and the dummy variables concerning the experimental condition were entered (i.e., the following contrasts: emotion vs. control, procedural vs. control, and coping vs. control). In the third step, the interaction terms of uncertainty and the dummy variables were entered. As can be seen in Table 2, the effects of uncertainty remain essentially the same when controlling for the effects of social comparison orientation and neuroticism. In other words, the B-values and the significance levels are highly similar to those reported in Table 1.

**Discussion**

In the present study, the influence of uncertainty in moderating the effects of different kinds of social comparison information was examined. Cancer patients who were about to undergo radiation therapy were provided with one of three kinds of social comparison information. It was expected that those high in uncertainty would benefit the most from the procedural tape. This tape provides procedural and sensory information about cancer and radiation therapy and was, therefore, expected to be the most capable in reducing uncertainty about cancer and radiation therapy. However, this was not confirmed by the results. Instead, the coping tape seems to be the most favorable for those uncertain about cancer and radiation therapy. While the patients who listened to the procedural tape, the
Table 2
Summary of regression analysis of uncertainty (U) and the dummy variables D1 (coping vs. control), D2 (emotion vs. control), and D3 (procedural vs. control), predicting negative mood, controlling for social comparison orientation (SCO) or neuroticism (N)

<table>
<thead>
<tr>
<th>Covariate</th>
<th>SCO</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R² change</td>
<td>B</td>
</tr>
<tr>
<td>Step 1</td>
<td>.05**</td>
<td>4.00***</td>
</tr>
<tr>
<td>Step 2</td>
<td>.15***</td>
<td>6.36***</td>
</tr>
<tr>
<td>U</td>
<td></td>
<td>-0.96</td>
</tr>
<tr>
<td>D1</td>
<td></td>
<td>5.73†</td>
</tr>
<tr>
<td>D2</td>
<td></td>
<td>-1.65</td>
</tr>
<tr>
<td>D3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td>.04*</td>
<td>-8.61**</td>
</tr>
<tr>
<td>U x D1</td>
<td></td>
<td>-0.27</td>
</tr>
<tr>
<td>U x D2</td>
<td></td>
<td>-4.63</td>
</tr>
</tbody>
</table>

*** p < .001, ** p < .01, * p < .05, † p < .10

emotion tape, and those in the control group all reported a higher negative mood with increasing uncertainty, those who listened to the coping tape did not. More importantly, those high in uncertainty who listened to the coping tape reported less negative mood than the patients high in uncertainty in the control group. Apparently, coping information, as provided on the coping tape provides a buffer for the negative consequences of uncertainty. Thus, the coping tape seems to be more beneficial than the procedural tape for those uncertain about their illness and treatment. It may be that the coping tape provided more new and unknown information than the procedural tape. Cancer patients receive a great deal of procedural information from their physicians. They do not, however, receive information about how fellow patients cope with their illness and treatment. However, it may simply be that the coping tape provides information that is
more effective in reducing uncertainty than the procedural tape. This notion is supported by findings from Taylor and Dakof (1988). They asked cancer patients to cite the most helpful actions they experienced in interacting with fellow patients. The most frequent helpful actions included coping well with the cancer and acting as a good role model, while least helpful actions were acting as a poor role model by coping poorly.

Interestingly, these effects of uncertainty hold up even when social comparison orientation and neuroticism are controlled for. This finding suggests that situational need for information is very important in moderating the effects of different kinds of social comparison information. Uncertainty, therefore, predicts a unique component of the effects of social comparison information.

The results of the present study have several important implications. First, it is one of the few studies to examine the role of uncertainty in moderating the effects of different types of social comparison information. While previous studies have shown that uncertainty fosters the need for social comparison information, the present study shows that uncertainty also influences the reactions to social comparison information. Furthermore, the fact that the effects of uncertainty remain even when controlling for relevant personality characteristics indicates the importance of situational uncertainty about cancer and radiation therapy.

Furthermore, the present study emphasizes the importance of providing cancer patients with information about how fellow patients are coping with their illness and treatment. This kind of social comparison information seems to function as a buffer to the negative effects of uncertainty. The present study confirms the notion that providing information about similar others who are coping well is a successful strategy for enhancing well-being (Ybema & Buunk, 1995).