

Neuroticism and Responses to Social Comparison Among Cancer Patients

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Abstract

The present study examined how the effects of three audiotapes containing different types of social comparison information on the mood of cancer patients depended on the level of neuroticism. On the procedural tape, a man and woman discussed the process of radiation therapy, on the emotion tape, they focussed on emotional reactions to their illness and treatment, while on the coping tape they focussed on the way they had been coping. A validation study among 115 students showed that the tapes were perceived as they were intended. The main study was conducted among 226 patients who were about to undergo radiation therapy. Compared to patients in the control group, as patients were higher in neuroticism, they reported less negative mood after listening to the procedural and the coping tape. Furthermore, as patients were higher in neuroticism, they reported less negative mood after listening to the coping tape than to the emotion tape. Copyright © 2009 John Wiley & Sons, Ltd.

Key words: neuroticism; role models; negative affect; cancer; radiation therapy

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INTRODUCTION

Patients with cancer usually face a number of pressing uncertainties. For instance, they may often not know how they will experience a treatment, they may feel insecure about their prognosis, and they may be concerned about the fact that the cancer may come back even after they have received extensive treatment (e.g. Fransson & Widmark, 1999; Klee, Thranov, & Machin, 2000). Given that, as observed in the classical work by Schachter (1959), situations characterized by stress and uncertainty may induce a desire for social comparison, it is not surprising that there has been a considerable interest in social comparison processes among patients with cancer (e.g. Bennenbroek, Buunk, Van der Zee, & Grol, 2002; Taylor, Kulik, Badr, Smith, Basen-Engquist, & Penedo, 2007; Tennen, McKee, & Affleck, 2000; Wood & Van der Zee, 1997). This interest goes far beyond the original work by Schachter (1959), who only examined the potential motives (including social comparison) underlying the desire for affiliation under threat. Current research, however, is not only addressing the effects of social comparison on the mood of cancer patients (Van der Zee, Buunk, & Sanderman, 1998), but also how such information may be used in interventions to inform patients and to help them in coping with their situation. For example, Van der Zee, Oldersma, Buunk, and Bos (1998) developed a computer program through which patients could select brief interviews with fellow patients. It appeared that a large majority of patients indicated they had compared themselves with the patients in the interviews, and found these interviews quite helpful. Cancer patients often report that the kind of information they receive from fellow patients is unique, and that only fellow patients realize what they are going through (Gray, Fitch, Davis, & Phillips, 1997).

In the present research among patients with cancer who were about to undergo radiation therapy for the first time, we examined the effects of different types of social comparison information on mood as a function of the level of neuroticism in these patients. According to Kulik and Mahler (2000), patients primarily compare themselves with others who are likely to have the most valuable information about the threat they face. Their research showed that patients in hospital settings in general prefer contact with post-operative rather than with pre-operative patients. Therefore, the social comparison information in the present research consisted of other patients who already had undergone radiation therapy disclosing their experiences. Three different types of social comparison information were included as they might fulfil important functions for patients (see Kulik & Mahler, 2000). In the first type of social comparison information, fellow patients offered *procedural* information about the various aspects of the treatment. This may provide patients with cognitive clarity and reassurance about what to expect, which would have a positive effect on mood. In the second type of social comparison information, fellow patients described the various positive and negative *emotions* they had experienced as a result of their cancer and radiation therapy. Patients may experience uncertainty about their emotional reactions to their disease and treatment, and fellow patients who have already undergone treatment may provide a point of reference for one's own responses. Research has indicated that uncertainty about one's emotions can promote the need for social comparison (Buunk, 1994; Cottrell & Eppley, 1977; Kulik & Mahler, 2000), and learning that other patients experience similar emotions as oneself may reduce uncertainty and improve mood. The third type of social comparison information concerned the way of *coping* of fellow patients. Although comparison with others worse-off on a cognitive level—thinking and emphasizing that one is better off than others—may help in alleviating one's negative

mood (e.g. Wills, 1981; Gibbons & Gerrard, 1991; Tennen et al., 2000), various studies have suggested that people facing a health threat are particularly interested in exposure to others who are coping well (e.g. Bennenbroek et al., 2002; Buunk, 1995; Molleman, Pruyen, & Van Knippenberg, 1986; but see Bogart & Helgeson, 2000). By comparing themselves with others who are coping well, patients may learn how to improve their own situation, may obtain hope and may become motivated (Taylor & Lobel, 1989).

Neuroticism and social comparison

Although different types of social comparison information may serve different functions, each type may be more beneficial for some individuals than for others. There is considerable evidence that individual difference characteristics play an important role in social comparison processes (Olson & Evans, 1999; Wheeler, 2000). While most studies have focussed on self-esteem (e.g. Aspinwall and Taylor, 1992; Aspinwall & Taylor, 1992) and depression (e.g. Ahrens & Alloy, 1997), increasing attention is given to the role of personality characteristics, in particular neuroticism. Neuroticism is characterized by a tendency to experience negative, distressing emotions and to possess associated behavioural and cognitive traits. Features that define this trait are fearfulness, irritability, low self-esteem, social anxiety, poor inhibition of impulses and helplessness (Costa & McCrae, 1985; 1992). In general, people high in neuroticism tend to set extremely high standards for themselves and to underestimate their own performance (Eysenck, 1947, 1981). This may cause them to feel less confident in their ability to deal with a threatening situation. More importantly, neuroticism is associated with an information processing style that is harmful to the self (Young & Martin, 1981). Not surprisingly then, compared to other personality characteristics, especially neuroticism is in normal populations related to a tendency to respond more negatively to social comparisons (e.g. Buunk, Van der Zee, & Van Yperen, 2001; Van der Zee, Buunk, & Sanderma, 1996, Study 2). Particularly relevant for the present research, Van der Zee and her colleagues have provided considerable evidence that as they are higher in neuroticism, patients with cancer tend to respond with more negative feelings to interviews with other patients (Van der Zee, Buunk, & Sanderma, 1996, Study 1; Van der Zee, Buunk, et al., 1998; Van der Zee, Oldersma, et al., 1998b).

In the present research, we assumed that cancer patients high in neuroticism will respond differently to the various types of social comparison information. Because of the emotional instability characteristic of individuals high in neuroticism (Costa & McCrae, 1985), listening to fellow patients expressing all the feelings they had may upset them further, as it may increase their anxiety. However, we reasoned that the confrontation with a fellow patient who is coping successfully may offer particularly patients high in neuroticism behavioural options to reduce their anxiety and distress, and may therefore induce a relatively more positive mood. Moreover, patients high in neuroticism will be particularly nervous and fearful and may therefore be in need for information about what to expect, and may feel relieved by hearing a fellow patient describe the procedure of the treatment. Thus, we expected that among patients high in neuroticism, compared to patients who did not receive comparison information, particularly exposure to fellow patients who talked about their emotions would increase negative affect, whereas exposure to fellow patients who provided an example of effective coping, or who told about the procedure of radiotherapy would decrease negative affect. Patients low in neuroticism have—nearly by definition—a lower level of anxiety, and a lower need to reduce their anxiety and distress, and therefore

the differences between the various types of social comparison information will be less pronounced, or even absent in this group of patients.

The social comparison information in the present research consisted of bogus interviews, in which individuals who acted as patients with cancer who had already undergone radiation therapy recounted different aspects of their experiences with cancer and radiation therapy. The main effects of the three types of social comparison information have been described in an earlier paper (Bennenbroek et al., 2003). The main findings were that the majority of patients rated the information on the tapes as very interesting, sufficient and complete. Patients who listened to the procedural tape reported more understanding of radiation therapy than patients who had listened to the emotion tape. Self-efficacy increased more in response to the coping than to the emotion tape, whereas negative mood increased more in response to the emotion tape than in response to any other tape. Participants in the control group who did not receive comparison information did not report more negative mood than participants who listened to either the procedural or the coping tape. The main goal of the present article is to consider how a central personality variable, i.e. neuroticism, affects the emotional responses to the various types of social comparison information. We first describe the developments of the tapes, next we present a validation study in which we tested if the tapes were perceived as intended (Study 1), and finally we present the main study in which the moderating influence of neuroticism on the effects of the tapes is described (Study 2).

PRELIMINARY STUDY AND DEVELOPMENT OF THE AUDIOTAPES

The audiotapes were developed in collaboration with the department of radiotherapy of a university hospital to examine the effectiveness of this type of simple interventions in preparing the patients for the impending period of radiation treatments and in reducing the negative feelings that might be associated with these treatments. 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 literatures. The scripts of the audiotapes represented an interview in which one male patient and one female patient who had 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 (see also Bennenbroek et al., 2003).

Each script was written to match the other scripts as much as possible regarding the issues that were addressed, the order of the subjects, the use of language and the total length of the audiotape. The main issues 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 focussed on a different aspect. The audiotapes were roughly 25 minutes long (see Table 1 for excerpts from the tapes).

Table 1. Excerpts of material of the procedural, emotion and coping audiotape

| Procedural tape | Emotion tape | Coping tape |
|--|---|---|
| <p>'So, every day to the hospital, with a taxi that brought me there, and home again. Except in the weekends. No treatments during the weekend'. 'You then go to the radiation room, and you lie on a table, which they then place under the radiation device. They tell you it's really important to lie still, so you concentrate on that'.</p> | <p>'I can't say that I was scared. It is overwhelming, though. It is all so new and unfamiliar...' 'They are very nice at the hospital. Of course I have felt uncomfortable, especially in the beginning. But I felt they were very understanding and respectful'.</p> | <p>'I wanted to stay positive, I would say to myself: 'Come on, you may be apprehensive, but in a few days you will know that's not at all necessary'. 'A lot changes when you hear you have cancer. But you have to remember that a lot of people are working very hard to make you healthy again'.</p> |

STUDY 1

Method

Sample

Participants in this validation study were 115 students (mean age = 20.26 years, SD = 2.80; 82% female), who were asked to rate the content of the tapes on a number of characteristics. The students volunteered to participate in the study in return for credits in undergraduate psychology classes.

Procedure

To examine whether we were successful in developing an emotion, coping and procedural tape, respectively, participants were randomly presented one of the three tapes and were blind to the hypotheses of the study. Each tape was divided in several fragments. For each fragment, participants had to indicate the number of emotions (for example: 'I had hope again, enough hope to go on with the treatment' or 'Yes, that letter had made me feel real worried'), the number of coping strategies (for example: 'I trained myself to think always positively' or 'I kept that at the time silent for my wife') and the number of facts (for example: 'Then I was sent to the department radiotherapy'). Furthermore, participants rated the overall tone of the interview (1 = very negative to 5 = very positive), the credibility and convincingness of the personal stories (Cronbach's $\alpha = .77$) and the comprehensibility of the interviews (1 = not at all to 5 = very).

Results and discussion

Analyses of variance (ANOVAs) revealed that the three tapes differed significantly on the manipulation aspects. Participants perceived more emotions in the emotion tape ($M = 1.84$, $SD = 0.75$) than in the coping ($M = 1.35$, $SD = 0.48$) and in the procedural tape ($M = 0.46$, $SD = 0.64$), $F(2, 107) = 44.46$, $p < .001$. The coping tape ($M = 1.88$, $SD = 0.69$) was found to include more coping strategies than the emotion ($M = 1.22$, $SD = 0.54$) and the procedural tape ($M = 0.58$, $SD = 0.64$), $F(2, 109) = 40.96$, $p < .001$. The procedural tape ($M = 2.53$, $SD = 0.14$) was found to contain more facts than the emotion ($M = 0.95$, $SD = 0.14$) and the coping tape ($M = 1.20$, $SD = 0.13$), $F(2, 108) = 38.26$, $p < .001$. The analyses also revealed a significant effect on overall tone of the tape, $F(2, 109) = 24.83$, $p < .001$, indicating that the emotion ($M = 3.14$, $SD = 0.93$) and procedural tape ($M = 3.22$, $SD = 0.59$) were valued as rather neutral and the coping tape ($M = 4.20$, $SD = 0.65$) was valued as slightly positive. No effects were found for credibility of the personal stories ($M = 4.46$, $SD = 0.75$) and comprehensibility of the interviews ($M = 4.74$, $SD = 0.53$), $ps > .10$, suggesting that all tapes were equally credible and comprehensible.

In sum, the tapes appeared to represent quite adequately the content they were intended to represent. As intended, the emotion tape contained the most emotions, the coping tape contained the most coping strategies and the procedural tape was found to contain the most facts. Although all tapes were judged to be equally credible and understandable, the coping tape was found to be somewhat more positive than the procedural and emotion tape.

STUDY 2

Method

Sample

The majority of the respondents in this main study 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 cancer in the head and neck area ($N = 17$). 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 diagnosis was between 1 and 36 weeks, with an average of 8 weeks.

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. Only patients were included who (1) were newly diagnosed with breast cancer, cervical cancer, cancer in the head and neck area or prostate cancer; (2) were going to be treated with external radiation therapy with curative intent for a period of 4–7 weeks (thus were not being treated yet); (3) were not participating in another psycho-oncological study and (4) had sufficient knowledge of the Dutch language.

Once it was determined that a patient met the inclusion criteria, he or she was approached by the 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 in which no tape was offered. 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.

Instruments

In the week prior to the start of their radiation treatments, the patients received, together with the audiotape, a questionnaire with several sections. Patients were instructed to fill out the first section, which included a measurement of neuroticism, before listening to the tape and the second section, which included a measurement of mood and the manipulation check, after listening to the tape.

Manipulation check. Although we established in Study 1 that we were successful in developing an emotion, coping and procedural tape, we also wanted to determine whether the patients in our effects study perceived the tapes as intended. Participants were asked to

select what they thought was the main topic of the tape, i.e. either the emotions the interviewees had experienced as a result of their disease and the treatment, information about the procedure of radiation therapy or the way in which the interviewees coped with their situation.

Neuroticism. Neuroticism was measured using a 12-item subscale from the 48-item version of the Eysenck's Personality Questionnaire (EPQ; Eysenck & Eysenck, 1991; Sanderman, Arrindell, Ranchor, Eysenck, & Eysenck, 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 α for this scale was $\alpha = .81$.

Negative mood. Negative 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 patients were asked to indicate how much the description applied to their moods 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 'vigour' items were reversed, so that a higher score indicated a more negative mood. Cronbach's α for the scale was high, $\alpha = .94$.

Results and discussion

Manipulation check

A χ^2 test showed that the three tapes were clearly perceived as different, $\chi^2(4) = 130.89$, $p < .001$. Overall, the tapes were classified as they were intended. The emotion tape was perceived as dealing with the emotions of the interviewees by 62% (whereas 35% classified it as dealing coping and 4% as dealing with the procedure). The coping tape was perceived by 74% as dealing with the way the patients coped with their situation (22% classified this tape as dealing with the emotions the interviewees had experienced and 4% as dealing with the procedural aspects of the treatment). The procedural tape was perceived by 79% as dealing with the facts about the procedure of radiation therapy (2% classified it as dealing with emotions and 19% as dealing with coping). That the fit was not perfect might be expected, and is even to some extent unavoidable. For example, on the coping tape it would have been awkward if the interviewees did not express some of their emotions, and describing one's feelings on the emotion tape might be viewed as describing one's way of coping. Nevertheless, in line with Study 1, in general the content of the tapes appeared to be perceived as intended.

A large majority of the patients indicated that they had compared themselves with the individuals on the emotion tape (82%), the coping tape (79%) and the procedural tape (93%). The differences in this respect between the tapes were not significant.

Moderating role of neuroticism

Preliminary analyses showed that the effects of the tapes did not differ for patients with different types of cancer. To examine the moderating influence of neuroticism on the effects of the audiotapes on negative mood, as recommended by Cohen, Cohen, West and Aiken (2003), six separate regression analyses were performed to examine all possible six contrasts between the tapes. To facilitate interpretation of the results, the scores of neuroticism were standardized (Aiken & West, 1991). In each regression analysis, in the first step neuroticism and the contrast were entered. In the second step, the interaction term between neuroticism and the contrast variable was entered. As we were not primarily

interested here in the main effects of the tapes, we report below only the interactions for each of the regressions. We like to note, however, that in each of the regressions, neuroticism had a significant main effect, $12.73 > Bs > 6.52$; $8.15 > ts > 5.29$; $112 > dfs > 101$, all $ps = .000$. Thus, with increasing levels of neuroticism, patients responded in general with more negative affect to the tapes.

As predicted, there was a just significant interaction between neuroticism and the emotion versus coping contrast ($B = 4.82$, $t(101) = 1.69$, $p < .05$, one-tailed). As can be seen in Figure 1, with increasing levels of neuroticism, the emotion tape evoked more negative mood than the coping tape did. While there was no significant interaction between neuroticism and the coping versus procedure contrast ($B = .91$, $t(104) = .36$, $p = .72$), there was a highly significant interaction between neuroticism and the coping versus control contrast: $B = 8.03$, $t(101) = 2.91$, $p = .004$. Thus, with increasing levels of neuroticism, the coping tape evoked less negative mood than the control condition in which no tape was offered (see Figure 1). Moreover, the interaction between neuroticism and the contrast of procedure versus control was significant, $B = 7.12$, $t(110) = 2.52$, $p = .013$, indicating that, as shown in Figure 1, with increasing levels of neuroticism, the procedural tape evoked less negative mood than the control condition in which no tape was offered. Finally, there was no interaction of neuroticism with the emotion versus procedure contrast ($B = 3.91$, $t(110) = 1.35$, ns), nor with the emotion versus control contrast, ($B = 3.21$, $t(102) = 1.02$, $p = .31$). To summarize, among patients high in neuroticism, especially the coping and the procedural tapes appeared to buffer the negative consequences of neuroticism, given that these resulted in a less negative mood than the control condition in which no tape was offered to the participants.

GENERAL DISCUSSION

In the present study, the moderating influence of neuroticism on the effects of three different audiotapes containing different types of social comparison information was examined. Our validation study among students showed that the three types of social comparison information were in general perceived as they were intended, although the coping tape was found to be perceived somewhat more positively than the procedural and

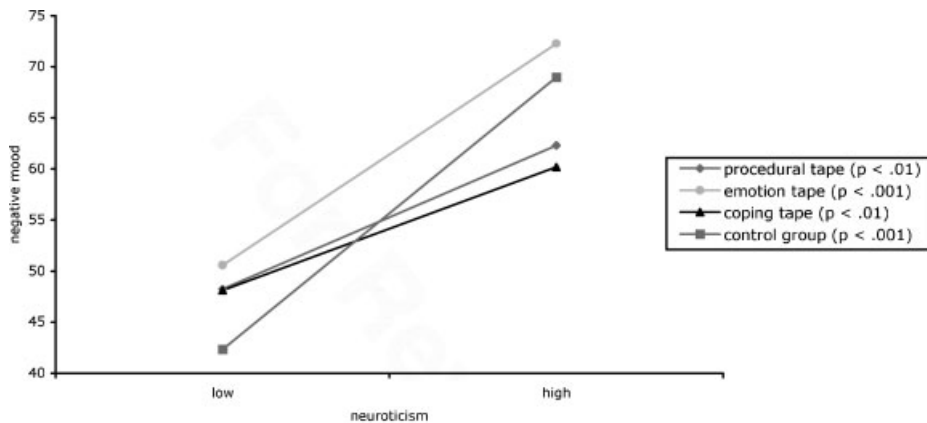


Figure 1. Neuroticism as related to negative mood in the four conditions.

emotion tape. However, as we will clarify below, this difference in overall tone is unlikely to explain our findings. While participants who listened to the emotion tape reported more negative mood than participants in the control condition, as individuals were higher in neuroticism they reported more negative mood after listening to the emotion tape as compared to the coping tape. For those high in neuroticism, it is clearly more disturbing to listen to fellow patients talk about their emotions than to listen to fellow patients talk about the way they coped with radiation therapy. In line with our expectations, as they were higher in neuroticism, individuals who listened to the coping tape also reported a significantly less negative mood than those in the control group. In addition, with increasing levels of neuroticism, listening to the procedural tape resulted in less negative affect than listening to the control tape. Apparently, exposure to models who demonstrate positive coping or who present procedural information tends to have a beneficial effect particularly on individuals high in neuroticism. These findings suggest that the negative mood in individuals high in neuroticism may be decreased by various pathways. Models who demonstrate positive coping may be stimulating role models, whereas procedural information may offer patients the cognitive clarity and reassurance about what to expect. The fact that both the coping and the procedural tape were found to be beneficial, although differing in emotional tone, suggests that the interpretation that the more positive tone of the coping tape, rather than its content, instigated the effect, is not very plausible. In addition, it is noteworthy that, as the models on the coping tape were developed to be successful, but not extremely successful, it may be that the models were just successful enough to be non-threatening and inspiring.

It is important to note that the majority of the patients did compare themselves with the patients on the audiotapes. The present results therefore underline the suggestion of Kulik and Mahler (2000) that patients may compare themselves with post-treatment patients who are likely to have information about the threat they face. Unlike what Schachter (1959) suggested, social comparison does not only occur when it is impossible to obtain explicit information about what other people experience (i.e. by not speaking to each other). In fact, few researchers would nowadays support this interpretation of Schachter, and explicit information exchange among, for instance, cancer patients is considered a basic way of comparing one's features with those of others (e.g. Bogart & Helgeson, 2000). Furthermore, the fact that the patients compared themselves to a similar degree with the individuals on the three tapes, suggests that the different effects of the emotion and coping tape as a function of neuroticism can not be ascribed to differences in the degree of social comparison.

The present research may have several important implications for the existing literature on social comparison among cancer patients. First, while most studies in this literature have examined the effects of the direction of social comparison (i.e. upward vs. downward comparisons), our findings suggest that the type of comparison may be as important as the direction. Previous research that provided preparatory information to patients occasionally included social comparison information, but usually did not manipulate the type of comparison (e.g. Thomas, Daly, Perryman, & Stockton, 2000; Walker & Podbilewicz-Schuller, 2005; with the exception of Mahler and Kulik, 1998). For example, Thomas et al. (2000) provided videotaped information to prepare patients for radiation or chemotherapy, which included both procedural and coping information from other patients. Furthermore, none of these studies examined the effect of information about other patients' emotional reactions to the illness experience compared to the effects of procedural and coping information on outcomes such as mood. Consequently, these studies

could not answer whether the type of comparison was important. Second, our findings suggest that comparisons with well-coping others may affect in particular patients high in neuroticism in a positive way. This is noteworthy because, in general, people high in neuroticism tend to process information in ways that are harmful to themselves, for instance by setting very high standards for themselves, which may lead to a relatively low confidence in their ability to deal with a threatening situation (e.g. Eysenck, 1981; Young & Martin, 1981). This may explain why social comparisons do in general not seem to have positive effects on such patients (Van der Zee, Buunk, & Sanderman, 1996, Study 1; Van der Zee, Buunk, & Sanderman, 1998; Van der Zee, Oldersma et al., 1998). Our research is one of the few to indicate that individuals high in neuroticism may under some conditions process information in a way that is beneficial and adaptive, and suggests that this may occur especially when such information enhances the sense of control by providing a model of effective coping, or by providing information about the treatment procedure.

In addition to these theoretical implications, the present study may also have important practical implications. It constitutes as a step forward in ascertaining what kind of social comparison information should be given to patients with cancer, and whether different kinds of information should be provided to different patients. The results suggest that while in general the emotion tape is not particularly effective as a form of coping assistance, this is especially true for people high in neuroticism, for whom both the coping tape and the procedural tape may be more helpful.

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