

Religious commitment, religious coping and anxiety: a study in German patients with breast cancer

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Within the last few years the relationship between religiousness and psychosocial adjustment has become a subject of increasing interest. However, previous research did not explicitly differentiate between dispositional religious commitment and situation-specific religious coping. The current cross-sectional study investigated the relative power of religious commitment, positive and negative religious coping, and religious commitment \times religious coping interactions in the prediction of anxiety. The sample consisted of 167 German breast cancer patients who were assessed during an inpatient rehabilitation programme. Results indicated that positive and negative religious coping were more strongly related to anxiety than dispositional religious commitment. Furthermore, hierarchical regression analysis revealed a religious commitment \times negative religious coping interaction. According to this interaction, there seems to be some synergistic effect of high levels of religious commitment and high levels of negative religious coping. In contrast, positive religious coping did not function as a moderator and appeared to be closely related to religious commitment. This may be due to the specific religious-cultural background in Germany.

Keywords: breast cancer, religious commitment, religious coping, Germany.

INTRODUCTION

The diagnosis and treatment of cancer is a life-altering crisis experience. Strenuous therapies, reduced functioning, fear of recurrence or progression, and uncertainty about survival are among the burdens patients have to face. Due to severe stress involving elements of personal threat, adjustment to illness is often an existential struggle for maintaining hope, control, and a sense of meaning and purpose in life. In this process, many

patients seem to rely on their religious faith and practice. Across numerous studies of participants with diverse types of cancer, the majority reported, often spontaneously, religiousness to be an important source of support in dealing with their illness (e.g. Moadel *et al.* 1999; Cigrang *et al.* 2003). 'Religiousness' as we use it here encompasses attitudes, values, convictions and/or practices that are related to a divine or transcendent power (sometimes also referred to as 'spirituality'). Religiousness in this sense may or may not explicitly be rooted in a belief system and framework of a specific (mostly Christian) religious tradition (for a detailed discussion of definition issues see Zinnbauer & Pargament 2005).

Since the 1990s, there has been an increasing interest in the role that religious faith and practice might play in patients' responses to cancer (Flannelly *et al.* 2002; Lin & Bauer-Wu 2003; Weaver & Flannelly 2004; Stefanek *et al.*

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2005; Thuné-Boyle *et al.* 2006). A considerable number of quantitative studies have so far found the religiousness of cancer patients to be modestly but meaningfully associated with psychosocial adjustment and beneficial coping strategies (e.g. Fehring *et al.* 1997; Baider *et al.* 1999; Brady *et al.* 1999; Fernsler *et al.* 1999; Gall 2000; Schnoll *et al.* 2000; Mehnert *et al.* 2003). Some studies showed that the relationships hold after accounting for demographic and disease variables (Baider *et al.* 1999; Brady *et al.* 1999; Holland *et al.* 1999).

However, the research results are not entirely consistent. Null findings and even negative associations were also shown, at least for some of the target variables (e.g. Silberfarb *et al.* 1991; Cotton *et al.* 1999; Holland *et al.* 1999; Rifkin *et al.* 1999; Tate & Forchheimer 2002; Nairn & Merluzzi 2003). This outcome may not only be due to variations in patient, disease, and contextual characteristics but also reflect the breadth of measurements used, tapping into different definitions and forms of religiousness (Stefanek *et al.* 2005).

Specifically, previous studies in cancer patients did not explicitly differentiate between religious commitment and religious coping (Sherman & Simonton 2001). Religious commitment denotes the perceived importance of religiousness in one's life and can be viewed as a more or less stable disposition that may or may not constitute a general resource in the coping process. Complementary, religious coping describes how patients draw on their religious faith and practice within a specific situation of crisis (Pargament 1997). The separate assessment of both religious commitment and religious coping has already proved to be useful in samples other than cancer patients: among members of Christian churches who envisioned serious negative life events, Pargament *et al.* (1990) found that measures of religious coping predicted outcomes above and beyond the contribution of more dispositional religious variables. Similar results have emerged from subsequent studies (see Pargament 1997; for an overview).

According to higher order factor analyses, religious coping can be classified into two broad patterns: positive religious coping, i.e. a confident and constructive drawing on religiousness for support, and negative religious coping, i.e. engaging in religious struggle and doubt (Pargament *et al.* 1998, 2000; Ano & Vasconcelles 2005). Recent results in a sample of multiple myeloma patients facing bone marrow transplantation suggest that negative religious coping is adversely and more strongly tied to beneficial outcomes than is positive religious coping (Sherman *et al.* 2005).

Moreover, it should be noted that there is the possibility of relevant interactions between religious commitment

and religious coping variables (Huber 2003, 2004). A specific pattern of religious coping might be either beneficial or unfavourable, depending on how highly religious the patient is. Specifically, it can be argued that, among people who view religiousness as important, religious coping efforts are likely to have more important implications for their health and well-being. Such moderating effects have not yet been taken into account in religious coping research. However, two prior studies suggest that religious coping may be more closely related to well-being and adjustment among the more religiously committed: a study of McIntosh *et al.* (1993) of parents who had lost a child to sudden infant's death syndrome found that highly religious parents engaged in more religious cognitive processing about the death of the child. This, in turn, was associated with less psychological distress 18 months later. Another study of Pargament *et al.* (2001) in a national sample of clergy, church elders and members found that clergy as the most committed participants reported higher levels of positive religious coping. This, in turn, was associated with higher levels of well-being.

It also has to be noted that cultural background assumes an important role in the association between religiousness and health. For example, results differ with respect to ethnicity and religious affiliation: whereas religious coping was common among Hispanic and African American cancer patients and exhibited substantial associations with less distress, research with white Americans has generated more limited results (Sherman & Simonton 2001). Similarly, remarkable differences were found between Catholic and Evangelical cancer patients (Alferi *et al.* 1999): in a sample of Hispanic breast cancer patients, religious commitment was associated with reduced distress during the course of the year for Evangelicals, but with increased distress for Catholics. This finding appears to be in line with previous research in other clinical and non-clinical settings, which suggested that Protestants tend to find religious coping a buffering factor in uncontrollable situations whereas Catholics find it helpful in controllable ones (Park *et al.* 1990; Tix & Frazier 1998). Given the importance of cultural background, it should also be emphasized that psycho-oncological research of religiousness has been predominantly conducted in the United States. Thus, findings are limited to this specific religious-cultural context and should – more than previously – be augmented by contributions from other countries, e.g. from Western Europe (Cousson-Gélie *et al.* 2005), South America (Echeverri *et al.* 2004) or Asia (Ando 2004; Matsushita *et al.* 2007).

The study reported here investigated the role of religious variables in response to illness in a sample of German breast cancer patients. So far, there is only

limited evidence from German studies that religious faith and practice might be favourable to coping with cancer (Zwingmann 2005): German cancer patients also seem to view religiousness as important in dealing with their illness (Muthny *et al.* 1992; Frick *et al.* 2006). Büsing *et al.* (2005, 2007) concluded that patients' religious/spiritual attitudes constitute specific psychosocial needs in cancer care. In a longitudinal study conducted by Ferring *et al.* (1994) religious faith was associated with more hope and less emotional distress in cancer patients. Likewise, Becker *et al.* (2006) prospectively found that head-and-neck cancer patients possessing a religious belief seemed to find a better way to deal with therapy's side-effects. In contrast, Mehnert *et al.* (2003) did not find associations between religious/spiritual beliefs and emotional distress among patients with malignant melanoma. Instead, these patients showed a substantial positive correlation between religious/spiritual beliefs and the use of an active-cognitive coping style, thus replicating findings by Holland *et al.* (1999).

The specific purpose of the present study was to determine the usefulness of the differentiation between religious commitment and religious coping in the prediction of psychosocial adjustment. We expected that religious coping variables as well as interactions between religious commitment and religious coping would be important predictors for psychosocial adjustment. In designing this study, we gave consideration to some criticisms of the general area of religiousness and cancer (Stefanek *et al.* 2005). First, we statistically controlled for relevant confounders. Second, in order to account for differences between Catholics and Protestants, we included indicators of religious affiliation as additional predictors.

The present study is part of a greater research project, some results of which were reported elsewhere (Zwingmann *et al.* 2006). However, our prior analyses did not include religious commitment and hence did not address interactions between religious commitment and religious coping.

METHODS

This is a cross-sectional study with 167 female German breast cancer patients. Participants filled out questionnaires during a 3-week stay at an inpatient rehabilitation centre. Patients were eligible for participation in the study if they were fluent in German and had been recently diagnosed for the first time. In excluding patients with recurrent breast cancer, we attempted to achieve a relatively homogeneous sample with regard to course of disease and treatment.

Sample and procedures

Patients were recruited consecutively at an oncological inpatient rehabilitation centre, the 'Rehabilitationsklinik Nahetal', Bad Kreuznach, Germany, between March and September 2003. They were asked to join a group session during their first week of stay. In this session, after a complete description of the study had been presented, written informed consent was obtained from those willing to take part in. Of 247 patients approached, 167 (68%) consented to participate and completed questionnaires.

The participants' mean age was 57 years ($SD = 11$, range = 31–83), 69% were married, and 72% lived together with a partner; for 56% the highest level of education was equivalent to junior high school. The time since diagnosis ranged between 1 month and 36 months with a mean post-diagnosis of 11 months ($SD = 7$). Diagnoses comprised Stage 0 (*in situ* carcinoma, 5%), Stage I (30%), Stage II (47%), Stage III (7%), and Stage IV (4%) breast cancer; in 7% information regarding stage was unavailable. Nearly all participants had received surgical treatment (63% breast conservation, 32% mastectomy, and 1% both). In terms of religious affiliation, 45% of the women were Catholics, 38% Protestants (Lutherans), and 5% members of other Christian churches, 10% had abandoned church membership, and 2% had never belonged to any denomination. These frequencies roughly correspond to the denominational distribution in the former West German states: Catholics and Protestants each comprise around 40% of the population, and other affiliation and no membership each constitute approximately 10% (Terwey 2003).

Measures

All scales were divided by the number of items so that the range of possible scores on the scales is equivalent to the range of possible answers on individual items.

Religious commitment

Religious commitment was measured with the 10-item Centrality Scale [Z-Skala (C-scale); Huber 2003], a recent German instrument grounded in the classical theoretical viewpoints of Allport (1966) and Glock (1962). 'Centrality' is conceptualized as the degree of (intrinsic) religiousness that guides one's daily life (according to Allport) and assessed as the sum of scores in five basic religious domains: interest, ideology, prayer, experience and worship (according to Glock). Item formulations are intentionally rather general (e.g. 'How often do you think about

Table 1. Descriptive statistics, zero-order (below diagonal; $N = 141-166$), and partial correlations (above diagonal; $d.f. = 133-154$)

	M	SD	Skewness	1	2	3	4	5	6
1. C-scale	2.08	1.01	0.02	–	0.17*	–0.01	0.85**	0.08	–0.08
2. Catholic (0–1)	0.48	0.50	0.07	0.18*	–	–0.74**	0.16	–0.05	–0.17
2. Protestant (0–1)	0.36	0.48	0.58**	0.01	–0.73**	–	0.00	0.17*	0.07
4. PRC	1.96	1.24	–0.07	0.85**	0.16*	0.02	–	0.09	–0.15
5. NRC	0.89	0.81	1.02**	0.09	–0.05	0.22**	0.10	–	0.25**
6. HADS-D-A	1.06	0.51	1.30	–0.11	–0.16*	0.04	–0.17*	0.20*	–

Partial correlations adjusted for age, education and partner. See *Methods* section for dichotomizing (0–1) religious affiliation variables. C-scale, Centrality Scale measuring religious commitment; PRC, positive religious coping; NRC, negative religious coping; HADS-D-A, Anxiety subscale of the German version of the Hospital Anxiety and Depression Scale.

* $P < 0.05$, ** $P < 0.01$.

religious questions?) in order to measure religious commitment irrespective of specific contents and traditions. Ratings are given on a 5-point scale ranging from 0 ('never/not at all') to 4 ('very often/very much'). The C-scale has been well validated and shows high internal consistency (Cronbach's alpha = 0.94 in this study).

Religious coping

Validated instruments for a refined assessment of religious coping are not yet available in the German language. Therefore, quite analogous to the ideas of the Brief Measure of Religious Coping (Brief RCOPE) (Pargament *et al.* 1998, 2000), we developed 27 items for use with cancer patients that would fit the religious-cultural context in Germany. In contrast to the Brief RCOPE, we avoided strong religious words like 'devil' or 'sin'. Participants rated the items on a 5-point scale from 0 ('not at all') to 4 ('very much'). An exploratory factor analysis (principal axis factoring, Varimax rotation) clearly indicated the presence of two factors (variance accounted for 54.4% and 12.8% respectively). The first scale, positive religious coping, contains 18 items and measures the degree to which religiousness offers support, meaning and solace in response to disease (Cronbach's alpha = 0.98; e.g. 'I'm seeking help from God in leveraging my resources'). The second scale, negative religious coping, comprises nine items that address bargaining and quarrelling with God, feelings of punishment by God, and religious doubt (Cronbach's alpha = 0.89; e.g. 'I'm asking myself why God is testing me'). Positive religious coping and negative religious coping were not significantly related (see Table 1).

Psychosocial adjustment

As an indicator of psychological adjustment we used the Anxiety subscale of the German version of the Hospital Anxiety and Depression Scale (HADS-D-A; Herrmann *et al.* 1995; seven items). All items are scored on a 4-point

scale ranging from 0 to 3. The HADS-D is well validated and internationally comparable (Herrmann 1997). Cronbach's alpha for the Anxiety subscale is 0.80 in this study, which is perfectly in line with prior findings.

Statistical procedures

Several sets of statistical analyses were conducted. First, preliminary correlation analyses for control variables were performed. Second, descriptive statistics as well as zero-order and partial correlation matrices were calculated for religious variables and anxiety. Finally, in order to approach the research question directly, a hierarchical multiple regression analysis was carried out with anxiety as the dependent variable.

To satisfy the requirements of regression analysis, the following categorical variables were dichotomously coded as follows: education: low (0; equivalent to junior high school and lower) versus high (1; equivalent to high school and higher); partner: living without (0) versus living with (1) a partner; surgical procedure: breast conservation (0) versus mastectomy or both (1); Catholic affiliation: Catholic (1) versus other (0); Protestant affiliation: Protestant (1) versus other (0).

Assumptions of regression analysis were carefully examined; residual diagnostics did not reveal serious departures. All statistical tests were two-sided, and all analyses were performed with pairwise deletion of missing data.¹ SPSS 14.0 for Windows software (SPSS Inc, Chicago, IL) was used for statistical computations.

RESULTS

Preliminary analyses for control variables

Correlation coefficients were calculated between socio-demographic characteristics as well as cancer descriptors

¹Repeating the analyses with listwise deletion of missing data did not change the overall pattern of results.

and all other measures in order to determine whether they functioned as potential confounders.

Significant relationships were found only for demographic variables: older patients reported higher religious commitment, $r(164) = 0.19$, $P < 0.05$, more negative religious coping, $r(161) = 0.22$, $P < 0.01$, and less anxiety, $r(144) = -0.17$, $P < 0.05$. Higher-educated participants used less negative religious coping, $r(154) = -0.21$, $P < 0.01$. Patients living with a partner also used less negative religious coping, $r(161) = -0.17$, $P < 0.05$. Cancer descriptors (stage, time since diagnosis, surgical procedure) were not significantly related to any of the measures utilized.

In sum, three out of six control variables showed significant correlations with religious variables or with anxiety. Therefore, these three variables – i.e. age, education, and partner – were controlled for in subsequent analyses.

Descriptive statistics and correlations

Table 1 reports descriptive statistics as well as zero-order and partial correlations for religious variables and anxiety. The average scores for religious commitment and positive religious coping fell near the midpoint of the potential range and the scales were normally skewed. In contrast, the mean score for negative religious coping was relatively low and the scale was positively skewed. Patients' mean anxiety score fell below the midpoint of the potential range; skewness was normal. However, a comparison with a German sample of healthy women revealed a percentile of about 70 for patients' average anxiety score (Herrmann *et al.* 1995).

Religious commitment and positive religious coping were highly correlated. Catholics tended to score higher on these variables. In contrast, Protestants revealed somewhat higher scores on negative religious coping, which was virtually unrelated to the other religious measures. Anxiety was negatively tied to positive religious coping and positively to negative religious coping. In addition, Catholics reported somewhat less anxiety. The overall correlation pattern hardly changed after controlling for age, education and partner.

Hierarchical regression analysis

The dependent variable was anxiety. Control variables were entered into the regression equation as the first block of predictors in order to partial out their effects. The following three blocks comprised various types of religious variables: the second block consisted of 'basic' religious variables, namely religious commitment and religious

affiliation indicators; the third block included religious coping variables; the last block was made up of the religious commitment \times religious coping interactions. Interaction terms were formed by multiplying together the respective standardized predictors. For equations containing interactions, the recommendations of Aiken and West (1991) were followed in order to achieve appropriate standardized solutions.

Due to the presence of high correlations among some of the religious variables (religious commitment/positive religious coping, Catholic/Protestant; see Table 1), blocks 2–4 were performed as stepwise analyses (forward selection, $P < 0.05$ criterion for entry). Sequential variable selection techniques generally produce regression models without serious multi-collinearity, thus providing well interpretable beta weights (Glantz & Slinker 1990). In our opinion, this favourable feature compensates for the disadvantage that the specific sequential steps applied here may yield a regression equation containing significant interactions without including one or both of the corresponding first-order terms. It is true that this is a violation of the traditional 'hierarchy principle' (Aiken & West 1991). It is, nonetheless, assumed that the weighted average ('main') effects concerned are not significant, because they did not reach the entry criterion in prior steps. Entering these non-significant main effects would not change the overall pattern, but potentially produce large standard errors due to multi-collinearity and complicate straightforward interpretation of beta coefficients. Thus, our hierarchical forward entry procedure seems justified.

Table 2 shows the results from hierarchical regression analysis. After controlling for age, education and partner (block 1), basic religious variables (block 2) were not significantly related to anxiety. On the contrary, religious coping variables (block 3) were selected as incremental predictors: anxiety was increased by negative religious coping and reduced by positive religious coping. Up to this point, the correlational pattern reported in Table 1 is more or less reflected. However, the religious commitment \times negative religious coping interaction (block 4) proved to be an additional predictor of anxiety, thereby reducing the predictive power of positive religious coping.

Analysed with the method recommended by Aiken and West (1991), the simple slopes of anxiety on religious commitment at low (1 SD below the mean) and high (1 SD above the mean) levels of negative religious coping are displayed in Figure 1. At a low level of negative religious coping, religious commitment exhibited a significant negative relationship with anxiety. In contrast, at a high level of negative religious coping, relationships were in the opposite direction.

Table 2. Hierarchical regression summary for anxiety on religious variables ($N = 144\text{--}166$)

	HADS-D-A			
	Step 1	Step 2	Step 3	Step 4
Intercept	–	–	–	1.21**
Block 1 (enter)				
Age	–0.18*	–0.22*	–0.20*	–0.01
Education (0–1)	–0.08	–0.04	–0.03	0.02
Partner (0–1)	0.03	0.06	0.06	0.05
Block 2 ($P_{in} = 0.05$)				
C-scale	–	–	–	–
Catholic (0–1)	–	–	–	–
Protestant (0–1)	–	–	–	–
Block 3 ($P_{in} = 0.05$)				
NRC	–	0.25**	0.27**	0.17**
PRC	–	–	–0.17*	–0.02
Block 4 ($P_{in} = 0.05$)				
C-scale \times NRC	–	–	–	0.18**
C-scale \times PRC	–	–	–	–
R^2 change	0.03	0.06**	0.03*	0.08**
R^2	0.03	0.09**	0.12**	0.20**
Adjusted R^2	0.01	0.07	0.09	0.16

Standardized effects (beta weights) are shown. The appropriate standardized solution for use with multiplicative terms typically contains a non-zero intercept (Aiken & West 1991). See *Methods* section for dichotomizing (0–1) categorical predictors.

HADS-D-A, Anxiety subscale of the German version of the Hospital Anxiety and Depression Scale; C-scale, Centrality Scale measuring religious commitment; NRC, negative religious coping; PRC, positive religious coping.

* $P < 0.05$, ** $P < 0.01$.

DISCUSSION

The present study investigated a sample of German breast cancer patients. Correlation analyses and a hierarchical regression analysis inquired into the interrelations between religious variables and anxiety in order to clarify the relative power of religious commitment, religious coping variables and religious commitment \times religious coping interactions in the prediction of anxiety.

Analyses controlled for relevant confounders. Furthermore, religious affiliation variables were included in the analyses in order to reveal potential differences between Catholics and Protestants. However, to start with, we found that all these variables had only a limited influence: there were some significant relationships between socio-demographic characteristics (age, education, partner) and the other measures; but after we took into account these potential confounders, correlational patterns largely remained unchanged (see Table 1). Consideration of religious affiliation variables also did not alter the overall picture. It is true that Catholic women reported higher religious commitment, higher positive religious coping and lower anxiety, whereas Protestant patients showed

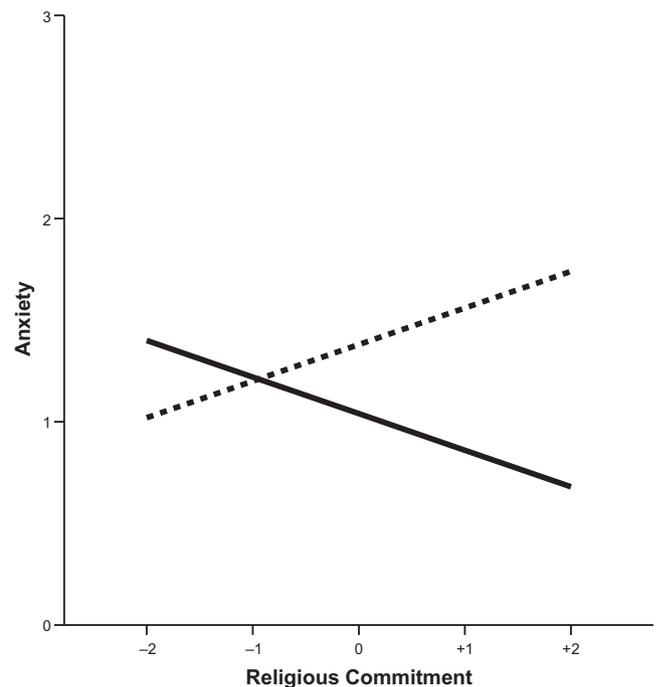


Figure 1. Simple slopes of anxiety on religious commitment by levels of negative religious coping, conditioned on values of zero for covariates and positive religious coping. Abscissa represents standardized scores (Min = -2.05 , Max = 1.89). — low negative religious coping (-1 SD); - - - high negative religious coping ($+1$ SD).

more negative religious coping (see Table 1). However, religious affiliation indicators did not reach the entry criterion in the hierarchical regression analysis conducted (see Table 2). That is, complex relationships proved to be identical for Catholics and Protestants. Some US findings suggest that associations between religiousness and health may substantially differ with respect to religious affiliation (Park *et al.* 1990; Tix & Frazier 1998; Alferi *et al.* 1999), but this was not the case in our German sample. Previous German research also concluded that there are more commonalities than differences between Catholics and Protestants (Lukatis & Lukatis 1989; Koch 1992; Zwingmann *et al.* 2004).

A first notable finding from regressing anxiety on religious variables is that religious commitment by itself turned out to be a very weak predictor. In fact, although the correlation pointed in the expected direction, religious commitment was not significantly related to anxiety (see Table 1) and did not reach the entry criterion in hierarchical regression analysis (see Table 2). Thus, perceived importance of religiousness did not constitute a dispositional coping resource in our sample. Accordingly, Mehnert *et al.* (2003) also did not find significant associations between dispositional religious/spiritual beliefs and

emotional distress in their recent cross-sectional study with German melanoma patients.

By comparison, religious coping variables were more strongly related to anxiety in the present study (see Table 1) and accounted for a considerable increment in the prediction of anxiety (R^2 change = $0.06 + 0.03 = 0.09$; see Table 2). This result seems to be in line with the conclusion by Pargament *et al.* (1990) that religious measures tailored to a particular situation of coping with crisis exhibit greater predictive power than generalized dispositional religious variables such as religious commitment.

Religious coping as measured in this study encompasses two sharply divergent patterns: positive religious coping, i.e. the constructive search for support, meaning and solace in religiousness, and negative religious coping, i.e. religious struggle and doubt. Positive religious coping was strongly correlated with religious commitment ($r = 0.85$; see Table 1). Both variables were similarly distributed and showed negative associations with anxiety. Although the relationships were stronger for positive religious coping (see Table 1), presumably due to the crisis-specific nature of this measure, religious commitment and positive religious coping have to be considered as fairly associated constructs. The level of the correlation between religious commitment and positive religious coping in our study ($r = 0.85$) seems to be somewhat higher than what is reported between similar measures of religious disposition and religious coping in the United States (e.g. r between 0.50 and 0.65 in students who had experienced the death of a friend and were presented with stressful vignettes respectively; Bjorck & Cohen 1993; Park & Cohen 1993). This may be in part due to religious-cultural differences: whereas belief in God is very widespread among Americans (>96%) and almost constant since 1944 (Bishop 1999), it is remarkably declining in Germany, presently totalling 63% in the former West German states and merely 13% in the new East German states (Terwey 2003). Concomitantly, religious beliefs are becoming increasingly personal, detached from church and heterogeneous (Frick *et al.* 2006). Against this background, it may be conceivable that Germans who nevertheless describe themselves as religiously committed are those who already have experienced support through religiousness and possess an easy access to positive religious coping strategies.

In contrast, negative religious coping was virtually uncorrelated with both religious commitment and positive religious coping but positively related to anxiety. In addition, negative religious coping was positively skewed. That is, in our sample, only relatively few breast cancer patients were activating this religious coping pattern. Negative religious coping was more frequently reported by

older women, less-educated participants, patients living without a partner and by Protestants.

In a sample of multiple myeloma patients, Sherman *et al.* (2005) found that negative religious coping was more strongly tied to outcomes than was positive religious coping: patients who struggled with their faith in response to their illness reported increased distress and cancer-related stress-symptoms as well as diminished emotional and social well-being. In our study, relationships proved to be somewhat more complex: we found an incremental religious commitment \times negative religious coping interaction which accounted for a further increment in the prediction of anxiety (R^2 change = 0.08; see Table 2). According to this interaction, high and low negative religious coping at the lowest level of religious commitment appeared to be relatively equal, whereas at a high level of religious commitment high and low negative religious coping diverged in their relation to anxiety (see Fig. 1). Thus, there seems to be some synergistic effect of high levels of religious commitment and high levels of negative religious coping: negative images of God may be viewed as central to one's life – and therefore provocative of anxiety.

When the religious commitment \times negative religious coping interaction was entered into the regression equation, the predictive power of positive religious coping was remarkably reduced. Thus, the religious commitment \times negative religious coping interaction did not exclusively explain additional variance components in anxiety but substituted variance components in anxiety that were previously explained by positive religious coping. This substitution may be attributed to the fact that the religious commitment \times negative religious coping interaction includes information about religious commitment, which – in turn – was highly correlated to positive religious coping. Also, there was no religious commitment \times positive religious coping interaction. Thus, the few US findings of positive religious coping being more closely related to the well-being among the more religiously committed (McIntosh *et al.* 1993; Pargament *et al.* 2001) could not be replicated in our German study. This may also be due to the high correlation between religious commitment and positive religious coping in our study.

LIMITATIONS AND CONCLUDING REMARKS

Several limitations of the present study deserve mention. First, it was conducted with a homogenous German sample, so the ability to generalize the findings to other populations of cancer patients is limited. The participants, newly diagnosed with breast cancer, were exclusively

women and had a relatively favourable prognosis. Second, psychosocial adjustment in this study was regarded as absence of anxiety as measured by the HADS-D-A. Surely, this does not reflect the complexity of psychosocial adjustment and also limits the ability to make generalizations from the findings. Finally, β -coefficients determined through hierarchical regression should not be used for predictive purposes, especially if the interaction term is included. In order to avoid multi-collinearity, sequential selections allowed for violations of the 'hierarchy principle'. Although it is assumed that this does not alter the overall pattern of results, accuracy of prediction is affected.

Despite the study's limitations, however, the present findings yield support to the argumentation that religious variables play a role in the adjustment of German cancer patients: regressing anxiety on religious variables yielded considerable increments. Our findings also highlight the need for a separate assessment of religious commitment and religious coping: positive and negative religious coping were more strongly related to anxiety than dispositional religious commitment. Furthermore, the regression of anxiety on various religious variables revealed a religious commitment \times negative religious coping interaction. In contrast, positive religious coping did not function as a moderator and appeared to be closely related to religious commitment. This may be due to the specific religious-cultural background in Germany.

For practical reasons, particular attention should be given to the potentially negative influence of religious struggle and doubt on the adaptation process of German breast cancer patients, especially in highly religious persons. In our sample, older, less-educated, partnerless and Protestant women were particularly prone to engage in negative religious coping. Murken and Müller (2007) give several instructive examples of positive as well as negative religious coping taken from additional in-depth interviews with some patients of our sample.

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