Distress and spousal support in women with breast cancer
Hinnen, Stefan

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CHAPTER 3 — THE ROLE OF DISTRESS, NEUROTICISM AND TIME SINCE DIAGNOSIS IN EXPLAINING SUPPORT BEHAVIORS IN PARTNERS OF WOMEN WITH BREAST CANCER: RESULTS OF A LONGITUDINAL ANALYSIS

Chris Hinnen, Mariët Hagedoorn, Robbert Sanderman, Adelita V. Ranchor
Psycho-Oncology, 2007; 16: 913-919

ABSTRACT
In this prospective study distress, neuroticism and time since diagnosis were investigated as determinants of spousal support behavior (i.e., protective buffering and active engagement) in a group of 92 partners of women with breast cancer. Distress and neuroticism were assessed at three months after diagnosis while protective buffering and active engagement were assessed at three, nine and fifteen months after diagnosis. Results indicate small but significant decreases in protective buffering and active engagement decreased over time. Moreover, initial distress and neuroticism were found to be strongly and positively related to protective buffering at all three measurements. In addition, less distress was associated with more active engagement in especially individuals scoring relatively low on neuroticism, but only at three months after diagnosis.

INTRODUCTION
Almost all people tend to seek and enjoy closeness in times of need (Bowlby, 1988). For most individuals in intimate relationships, a partner will be the primary source of comfort and safety when confronted with a physical and psychological threat such as cancer. Particularly, spousal support that leads patients to feel valued and cared for has repeatedly been found to promote adaptation (Helgeson & Cohen, 1996). Unfortunately, partners may not always be able to provide support that is helpful (Manne et al., 2003; Pistrang & Barker, 1995). Unsupportive behavior from a partner, such as dismissing concerns and avoiding negative emotions, has frequently been found to be associated with more distress in cancer patients and with more difficulties adapting to the changes imposed by the illness (Lichtman & Taylor, 1986; Manne, Ostroff, Winkel, & Grana, 2005; Manne, Taylor, & Dougherty, 1997).

Hence, it becomes valuable to identify factors associated with (un)supportive behavior by partners. Although gender and characteristics of the support recipient (e.g., level of distress, coping abilities, emotional expressivity) may also influence a partner’s support behavior (Allen, 1994; Kring & Gordon, 1998; Kuijer et al., 2000; Lutzky & Knight, 1994; Quartana, Schmaus, & Zakowski, 2005), the present study focuses on (I) the emotional state of mind (i.e., anxiety and depressive feelings) of male partners of women confronted with breast cancer, (II) their disposition to experience high levels of distress (i.e., neuroticism), and (III) time since diagnosis.

We will focus on two types of support behavior, protective buffering and active engagement. Protective buffering is a way of providing support characterized by denying fears and worries and by avoiding negative experiences which is generally perceived as unsupportive. In contrast, active engagement is often perceived as supportive and is characterized by involving the patient in discussions, asking how the patient feels and other problem- and emotion focused strategies (Coyne & Smith, 1991; Hagedoorn et al., 2000).

More distressed partners may use more protective buffering strategies such as avoid-
ing negative feelings and trying to prevent additional negative experiences for two reasons. On the one hand they may use these strategies as they feel it would hinder the patient’s adjustment when paying too much attention to negative thoughts and feelings (Lichtman, Taylor, & Wood, 1987) and on the other hand they may use these strategies as a way to cope with their own fears and worries (Coyne et al., 1991; Thompson & Bolger, 1999). In studies among myocardial infarct patients more distressed partners have been found to use more protective buffering (Coyne et al., 1991; Suls, Green, Rose, Lounsbury, & Gordon, 1997). Only when emotional relief is attained and distress is alleviated, partners may have the mental capacity to be available and responsive to their ill wife’s needs and invite them in conversations about their fears and worries (Lichtman et al., 1986). Hence, we hypothesized that more distressed partners would use more protective buffering and less active engagement (Hypothesis 1).

Neuroticism and distress are related but distinct constructs with neuroticism being a relatively stable trait, representing the tendency to frequently experience distress (Costa & McCrea, 1985; Ormel & Wohlfarth, 1991). Moreover, individuals high in neuroticism are marked by hypervigilance and by reacting overly emotional without having the capacity to regulate emotions adequately (Eysenck & Eysenck, 1984). Similar to distress, neuroticism can be viewed as a risk factor for becoming overly involved in one’s own concerns, which might become manifest in the support offered. In accordance with this notion, persons high on neuroticism have repeatedly been found to use more wishful-escapism, avoidance coping, and less problem-focused strategies (Gomez, Holmberg, Bounds, Fullarton, & Gomez, 1999; Patrick & Hayden, 1999; Vollrath, Torgersen, & Alnaes, 1995). Therefore, we hypothesized that partners higher in neuroticism would use more protective buffering and less active engagement (Hypothesis 2).

We will also explore whether neuroticism may moderate the association between distress and spousal support behavior based on two competing thoughts. To the extent that distress and neuroticism are related but separate constructs, the question arises whether a low score on neuroticism may compensate for a high score on distress. It could be argued that partners low in neuroticism are better able to deal with negative emotions than partners high in neuroticism (Kokkonen & Pulkkinen, 2001) and, therefore, may show less protective buffering and more active engagement when distressed. However, to the extent that distress and neuroticism are both potential risk factors for unsupportive behavior, it could be expected that a high score on one factor may be enough for higher levels of protective buffering or lower levels of active engagement. Thus, we advanced no specific hypothesis about the moderating influence of neuroticism on the link between distress and support behavior, but considered this an important empirical question.

Moreover, this study also seeks to assess whether time since diagnosis has an effect on support behavior. As time passes, a natural adaptation process should occur and the illness may become more integrated in current life (Heim, Valach, & Schaffner, 1997). Spousal support might mirror this process. The need to discuss or, conversely, avoid illness-related fears and worries may diminish over time, which will be reflected in diminishing scores on both protective buffering and active engagement. Furthermore, given the longitudinal design we were also able to explore whether the link between distress, neuroticism and spousal support behavior was stable over time or, instead, was qualified by the time since diagnosis.

**Method**

**Design and Procedure**

The current study applies a longitudinal design in which the predictor variables (i.e., covariates, distress and neuroticism) were assessed at the beginning of the study.
(i.e., three months after diagnosis), and the outcome variables (i.e., protective buffering and active engagement) were assessed three, nine and fifteen months after diagnosis. The data for the present study was collected as part of a larger study investigating the influence of intimate relationship dynamics on adaptation to breast cancer in the first year after diagnosis. In a procedure required by the hospital Medical Ethics Committee, women received a letter from specialized nurses inviting both themselves and their partner to participate in the study. Women interested in participating in the study were encouraged to enlist their partners and to mail back consent forms. After approximately four weeks couples who did not return the consent form were contacted by the study team with a reminder. Inclusion criteria consisted of living with a partner, patients’ age between 30 and 75 years, survival prognosis of at least 15 months, no previous cancer history for both patient and partner, and Dutch speaking.

A total of 284 patient couples considered participation, took information about the study home and were contacted with the question whether they were willing to participate. In the end, 92 couples (a response rate 32%) participated in the study of which almost all (94%) remained in the study. This response rate reflects the burden of the intensive design of the study and, perhaps more importantly, the consent procedure required by the Medical Ethics Committee and the initiative it required from the patients. Nonetheless, this rate is comparable to what has been found in some well-resourced studies investigating couples coping with breast cancer (Manne et al., 2005; Manne et al., 2006). Not surprisingly, the main reason (31%) for not participating was that couples indicated that participating was too great a burden. In addition, 28% of the couples were simply not interested; in 15% of the cases a partner was not willing to participate; 10% indicated that they wanted to close the cancer history; and another 16% of the couples gave other reasons for not participating in the study.

For the present study we selected partners of women with breast cancer. Due to drop-outs and missing values the total number of participants ranged from 92 at T1 to 84 at T3. At T1, partners were on average 54 years old (SD = 9.4, range = 34-77). Almost 31% (n = 28) received a lower level of education, 36% (n = 33) received a secondary level education and 33% (n = 31) received a higher level education. Two-third of the participants had a paid job (67.4%, n = 62).

Measures

Spousal support. Participants completed a questionnaire assessing support behavior (Kuijer et al., 2000; Hagedoorn et al., 2000). Partners were asked to indicate to what extent they adopted active engagement and protective buffering as a way of providing support. The questionnaire contained 13 items with a five point scale ranging from (1) ‘never’ to (5) ‘very often’. Five items constitute the active engagement scale (e.g., “I ask my partner how he or she feels”) and eight items measure protective buffering (e.g., “I try to keep my worries about my partner to myself”). In this study the internal reliability of the subscales was satisfactory. Cronbach’s alpha for the active engagement scale was .81 at T1, .97 at T2 and .77 at T3. For the protective buffering scale Cronbach’s alpha was .75, .85 and .87 at T1, T2, and T3, respectively.

Psychological distress. Participants completed the Hospital Anxiety and Depression Scale (HADS) to assess psychological distress (Zigmond & Snaith, 1983; Spinhoven et al., 1997). The HADS is a 14-item self report scale and contains two seven item-scales: one assessing feelings of anxiety and the other depressive symptoms with a score range between 0-21. In this study the total score of both dimensions combined was calculated as indicator of psychological distress. Cronbach’s alpha for the total score was .87 at T1.
Neuroticism. A short, 12 item, version of the Eysenck Personality Questionnaire (EPQ) (Eysenck et al., 1984) was used to assess neuroticism (e.g., “Does your mood often go up and down?” or “Are your feelings easily hurt?”). Response alternatives were ‘yes’ or ‘no’ and scores ranged from 0 to 12. Cronbach’s alpha was .84.

Statistical Analysis

The data collected are hierarchically structured in that the three measurement moments are nested within a person. Therefore, time since diagnosis is the lowest level (first level), which is nested in the partner (second level). A hierarchical linear model has the advantage that it does not presume that all measurements are equally correlated over time with constant variance, allowing a more realistic error structure than more traditional analysis techniques (Gibbons et al., 1993). In the present study we used HLM software to analyze the data (Bryk & Raundenbush, 1992; Bryk, Raundenbush, & Congdon, 1996).

Pearson’s correlation coefficients were calculated among the variables under study. Next, models explaining support behavior (either protective buffering or active engagement) were developed sequentially. First, for each support behavior a model with no explanatory variables, only the intercept (i.e., an unconditional model) was calculated to determine the amount of variance at the person and time level. Second, a model with only time as explanatory variable (unconditional growth model) was calculated to determine whether the outcome variables changed over time. Third, the unconditional growth models were extended into conditional growth models by including (I) possible covariates (i.e., age, employment status, and education level), (II) neuroticism and distress, and (III) the interaction term of distress by neuroticism as fixed effects at the person level (level 2). By including the interaction term we were able to investigate whether neuroticism moderated the association between distress and spousal support behavior. For clarity and reasons of space statistically redundant variables were excluded before final analysis. Finally, we extended the conditional growth models by including (iv) distress, neuroticism and the interaction term as level one (time) predictors. This final step allowed us to explore whether the associations between distress, neuroticism and the outcome variables were qualified by the time since diagnosis. Differences between partners in the trajectory of support behavior over time are represented by the random coefficient.

When needed, model-based graphs were created as an aid to determine how the relationships between the outcome variables and predictors could be understood. The significance of the variances explained by the different models was determined by a likelihood ratio test (i.e., deviance test). Moreover, distress and neuroticism were centered around the sample mean in order to reduce multicollinearity between predictor and interaction term (Aiken & West, 1991).

RESULTS

Correlations between the variables under study.

Table 1 shows the means and standard deviations of, and the correlations between, the main study variables. Neuroticism was moderately associated with distress (T1: r = .43, p < .001) and both neuroticism and distress were correlated with protective buffering at T1 (r = .41, p < .001; r = .47, p < .001), T2 (r = .40, p < .001; r = .33, p < .001), and T3 (r = .32, p < .001; r = .28, p < .001). Neuroticism and distress were not significantly related with active engagement. At the different assessment points protective buffering and active engagement were unrelated, indicating that partners can be actively engaged and, at the same time, use protective buffering. Furthermore, Table 1 shows that both protective buffering and active engagement were relatively stable over time with strong correlations. Moreover,
correlation coefficients showed that older partners used more protective buffering (T1: \( r = .28, p < .001 \), T2: \( r = .12, p = .285 \), T3: \( r = .27, p < .05 \)), while higher educated partners used less protective buffering (T1: \( r = -.47, p < .001 \), T2: \( r = -.40, p < .001 \), T3: \( r = -.39, p < .001 \)). Employment status was not correlated with support behavior.

**Distress, neuroticism and time since diagnosis as determinants of protective buffering**

Intraclass correlation coefficients of the unconditional model showed that the majority of the variance was at the person level (66%) and the remaining 34% was at the time level. These results indicate that scores on protective buffering differed enough between partners and over time to justify a two-level model. Next, we computed an unconditional growth model by entering time into the model. Table 2 shows that protective buffering decreased over time with a score of -0.11 \( (p = .001) \) which explained 7% of the level-1 (time) variance in protective buffering. This model fitted the data significantly better than the unconditional model, \( x^2 (1) = 12.93, p = .001 \). The random effect indicates that there are significant variations among partners in the course of protective buffering, \( x^2 (89) = 652.61, p < .001 \).

Before specifying the models further we added sociodemographics (age, education level and employment status) to the unconditional model. Only level of education was significant and was retained in subsequent analysis. Next, we added distress and neuroticism to the model in order to investigate whether these variables explained differences in the use of protective buffering between partners. Table 2 shows the coefficients for education level, neuroticism and distress. The negative coefficient for level of education indicates that higher educated individuals reported less protective buffering. The positive coefficients for neuroticism and distress indicate that more distressed partners and partners higher in neuroticism used more protective buffering. Results showed that this conditional growth model explained 41% of the variance in protective buffering between subjects and fitted the data better than the unconditional growth model, \( x^2 (3) = 39.00, p < .000 \). Thus, Hypothesis 1 and 2 were supported.

Next we entered, the interaction term of distress by neuroticism into the model, this model did not fit the data better than the model without the interaction term, \( x^2 (1) = 0.09, p > .500 \), and was excluded from further analysis. Moreover, we explored whether distress and neuroticism interacted with time since diagnosis by including these variables at the time level (level 1). This model explained 41% at the person level and 1% at the time level which was not significantly more than the variance explained by the conditional growth model without these level 1 predictors, \( x^2 (2) = 1.87, p > .500 \). These results indicate that the association between distress, neuroticism and protective buffering was not qualified by time since diagnosis.

**Distress, neuroticism and time since diagnosis as determinants of active engagement**

Intraclass correlation coefficients showed that 57% of the variance of active engagement was at the person level. Meaning that differences between persons was only slightly larger than differences over time (43%) and that a two-level model was justified. The unconditional growth model (Table 2) for active engagement showed that time since diagnosis explained 18% of the variance in active engagement at the time level and fitted the data significantly better than the conditional growth model, \( x^2 (1) = 35.41, p < .001 \). The negative coefficient indicates that active engagement decreased over time with an average score of -0.15. The significant random effect indicates that the course of active engagement differs among partners, \( x^2 (89) = 530.58, p < .001 \).
Socio-demographics (age, education level and employment status) did not add significantly to the variance already explained by the unconditional growth model and were dropped from subsequent analyses. Next we entered neuroticism and distress to the unconditional growth model as level 1 (person) predictors. This model was not significant, $x^2 (2) = .47, p > .500$. Next, we entered the interaction term of neuroticism by distress to the model (see table 2). This interaction term was found marginally significant ($p = .056$) and accounted for 5% of the variance in active engagement scores between subjects. This model did, however, not fit the data better than the unconditional growth model, $x^2 (3) = 4.13, p = .247$.

Moreover, in order to explore whether distress, neuroticism and the interaction term of neuroticism by distress did explain active engagement when time since diagnosis was taken into account, these predictor variables were entered at the time level (level 1). Table 2 shows that the interaction term of neuroticism by distress was significant at the person ($B = 0.007, p < .05$) and time level ($B = -0.002, p < .05$), explaining respectively 4% and 5% of the variance in active engagement scores. This model fitted the data better than the unconditional growth model, $x^2 (6) = 12.42, p = .05$, which indicates that the interaction term of neuroticism by distress does explain differences in active engagement between partners when time since diagnosis was taken into account. In order to understand this interaction better a model based graph was created (see Figure 1).

Figure 1 shows the regression lines representing the association between active engagement and distress in partners scoring high and low on neuroticism (75th percentiles = .92 and 25th percentiles = -2.08) at different moments in time. Figure 1 should be read as follows. Based on initial neuroticism scores and distress the use of active engagement at the three different time points is explained. In the group of partners who scored relatively high on neuroticism distress did not seem to explain variations in the use of active engagement at the different moments in time. In the group of partners who scored lower on neuroticism, distress was more strongly associated with variations in active engagement, indicating that partners low in neuroticism who experienced less distress reported more active engagement. However, this association became weaker over time, indicating that the effect of initial distress levels on active engagement in people low on neuroticism decreased when the time since diagnosis passes.

**Discussion**

The present study showed that both protective buffering and active engagement decreased significantly over time. Although these decreases were expected as part of the normal adaptation process, they were quite small in magnitude indicating that spousal support behavior directed at dealing with illness-related thoughts and feelings remains quite prominent over time. The significant random effects indicate, however, that differences exist between partners. Thus, although in general illness-related support behavior may decrease over time, variation between partners exists. Moreover, as hypothesized, distress and neuroticism were associated with partners support behavior. Specifically, who were more distressed three months after diagnosis, and who reported higher levels of neuroticism used more protective buffering at three, nine, and fifteen months after diagnosis. In other words, in addition to education level, trait and state distress appear to be robust and strong explanatory factors for the use of more protective buffering strategies such as denying fears and worries, and avoiding negative experiences.

An explanation for the association between distress and protective buffering might be that the concern for others, even for those we love and clearly feel empathy for, is fragile and may be overridden by self-concern (Batson, 1990). When distress increases, the motivation of people may become more
focused on managing their own emotions, explaining why more distressed partners used more protective buffering strategies. An opposing explanation for the association between distress and protective buffering might be that protective buffering induces distress (Suls et al., 1997). According to Suls and colleagues (1997), the use of protective buffering strategies may have an averse effect on affect regulation and adaptation, resulting in higher levels of distress over a prolonged period of time. The issue of causality is complex and difficult to address in a survey studies. Hence, the findings in the present study can not provide an exclusive answer to this issue.

Moreover, the finding that partners who scored higher on neuroticism reported more protective buffering may be explained by the possibility that these partners may be hypervigilant to threats and focused on their own concerns, so that they no longer have the mental resources necessary to attend to others’ needs and worries in an open and responsive way. In addition, distress and neuroticism did to a much lesser degree explain differences in active engagement between partners. A lower level of distress three months after diagnosis had a weak short-term positive association with the use of active engagement but only in partners scoring relatively low on neuroticism. The interaction effect of distress by neuroticism by time on active engagement does not support the notion that lower levels of neuroticism may compensate for higher distress scores. Instead, these findings appear to support the notion that neuroticism and distress are both potential risk factors for being less actively engaged and that only partners scoring low on neuroticism show more active engagement when distress is relatively low.

The finding that partner characteristics were to a much lesser degree associated with variations in active engagement than with variations in protective buffering indicates that the use of more supportive strategies, such as talking about fears and worries, may be determined by other characteristics, such as the ill partner’s emotional state of mind and the quality of the relationship. This notion is in accordance with the finding that, in general, more distressed and more happily married patients have partners who show more active engagement (Hagedoorn et al., 2000; Kuijer et al., 2000).

For the interpretation of the results it is important to bear in mind both the strengths and limitations of the present study. We focused on male partners of women with breast cancer while most previous studies investigating determinants of spousal support have either focused on female partners (Coyne et al., 1991; Suls et al., 1997) or have not differentiated between men and women (Kuijer et al., 2000; Manne, Alfieri, Taylor, & Dougherty, 1999). It is important to take gender into account, because it may affect the results. For example, male partners of women confronted with cancer have been found to report less distress than female partners (Hagedoorn, Buunk, Kuijer, Wobbes, & Sanderman, 2000) and men have been found to be more reluctant to acknowledge threatening experiences and respond to distress with more repressive and distancing strategies (Kring et al., 1998; Lutzky et al., 1994). Hence, we should be careful to generalize the present findings to female partners. A strength of the present study is the use of a more sophisticated method to analyze the longitudinal data. A clear advantage of using a hierarchical linear method of analysis is that we were able to investigate whether spousal support changed over time and whether the associations between distress, neuroticism and support behavior were qualified by the time since diagnosis.

Clinically the results of the present study appear to imply that it is important to assess partner characteristics (e.g., emotional state of mind and personality) of women with breast cancer. This may help explain and even predict the use of more protective buffering and less active engagement, which in turn, may explain poorer adjustment in women with breast cancer.


Figure 1. Active engagement as a function of distress, neuroticism and time since diagnosis.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neuroticism</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.08</td>
<td>3.06</td>
<td>90</td>
</tr>
<tr>
<td>Distress</td>
<td></td>
<td>.43**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9.20</td>
<td>6.09</td>
<td>92</td>
</tr>
<tr>
<td>Protective buffering (T1)</td>
<td></td>
<td>.41**</td>
<td>.47**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.45</td>
<td>0.66</td>
<td>89</td>
</tr>
<tr>
<td>Active engagement (T1)</td>
<td>.15</td>
<td>-.12</td>
<td>-.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.19</td>
<td>0.51</td>
<td>91</td>
</tr>
<tr>
<td>Protective buffering (T2)</td>
<td></td>
<td>.40**</td>
<td>.33**</td>
<td>.66**</td>
<td>-.23*</td>
<td></td>
<td></td>
<td>2.30</td>
<td>0.73</td>
<td>88</td>
</tr>
<tr>
<td>Active engagement (T2)</td>
<td>-.04</td>
<td>-.03</td>
<td>-.03</td>
<td>.59**</td>
<td>-.06</td>
<td></td>
<td></td>
<td>3.94</td>
<td>0.54</td>
<td>88</td>
</tr>
<tr>
<td>Protective buffering (T3)</td>
<td></td>
<td>.32**</td>
<td>.28**</td>
<td>.69**</td>
<td>-.12</td>
<td>.75**</td>
<td>-.00</td>
<td>2.24</td>
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<tr>
<td>Active engagement (T3)</td>
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<td>.05</td>
<td>-.01</td>
<td>.66**</td>
<td>-.09</td>
<td>.68**</td>
<td>-.02</td>
<td>3.88</td>
<td>0.49</td>
<td>85</td>
</tr>
</tbody>
</table>

*p < .05, ** p < .01

Note: due to missing data N varies between 92 and 84
### Table 2.

Predictors of active engagement and protective buffering in a hierarchical linear model analysis

<table>
<thead>
<tr>
<th></th>
<th>Protective Buffering</th>
<th>Active Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unconditional model</td>
<td>Conditional model a</td>
</tr>
<tr>
<td>Fixed effects</td>
<td>[coefficient (SE)]</td>
<td></td>
</tr>
<tr>
<td>Person level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>2.46 (.066)***</td>
<td>2.94 (.123)***</td>
</tr>
<tr>
<td>Level of education</td>
<td>-0.12 (.026)***</td>
<td>-0.12 (.026)***</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>0.04 (.020)*</td>
<td>0.04 (.023)*</td>
</tr>
<tr>
<td>Distress</td>
<td>0.02 (.010)*</td>
<td>0.03 (.011)*</td>
</tr>
<tr>
<td>N × D</td>
<td>0.01 (.002)</td>
<td>0.01 (.003)*</td>
</tr>
<tr>
<td>Time level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.11 (.032)**</td>
<td>-0.11 (.031)***</td>
</tr>
<tr>
<td>Neuroticism (N)</td>
<td>0.000 (.011)</td>
<td></td>
</tr>
<tr>
<td>Distress (D)</td>
<td>-0.01 (.006)</td>
<td></td>
</tr>
<tr>
<td>N × D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Random effects</td>
<td>[variance (SD)]</td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>0.346 (.588)**</td>
<td>0.204 (.452)**</td>
</tr>
<tr>
<td>Level 1</td>
<td>0.162 (.403)**</td>
<td>0.162 (.402)**</td>
</tr>
<tr>
<td>Variance c</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R2 person</td>
<td>7%</td>
<td>41%</td>
</tr>
<tr>
<td>R2 time</td>
<td>1%</td>
<td></td>
</tr>
</tbody>
</table>

**a:** Conditional growth model with level two (person) predictors

**b:** Conditional growth model with level one (time) and two (person) predictors.

**c:** Statistical significance of the variances was determined by the likelihood ratio test

* p < .05, ** p < .01, *** p < .001
Figure 1. Active engagement as a function of distress, neuroticism and time since diagnosis.