Stressful life events as a link between poor nonverbal communication and recurrence of depression

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Submitted
ABSTRACT

Background
Interpersonal difficulties and stressful life events are important etiological factors in (recurrence of) depression.

Aim
To examine whether stressful life events mediate the influence of problems in nonverbal communication on recurrence of depression.

Methods
We registered nonverbal expressions of involvement from videotaped behavior of 101 remitted outpatients and their interviewers. During a 2-year follow-up, we assessed stressful life events and recurrence of depression.

Results
The less participants and interviewers had adjusted their nonverbal involvement behavior to each other, the higher the incidence of stressful life events, and –via these– the risk of recurrence of depression.

Conclusions
A poor nonverbal match during social interaction may induce stressful life events resulting in recurrence of depression. The results underline the importance of an interpersonal approach in research and treatment of recurrent depression.
INTRODUCTION

Interpersonal difficulties and lack of social support play an important role in depressive disorder (Joiner and Coyne, 1999). As a large part of interpersonal communication takes place via nonverbal channels (Depaulo and Friedman, 1998), inadequate nonverbal communication has a great share in these interpersonal problems (Segrin, 2000). An earlier study of our group showed that poor nonverbal communication also increases risk of recurrence in remitted patients (Bos et al., 2005). Especially the nonverbal interplay between interaction partners appeared crucial. Lack of mutual adjustment of nonverbal involvement behavior was indicative of a higher risk of recurrence.

Problems in nonverbal communication may also induce stressful life events. Stressful life events are notorious triggers of depression (Kessler, 1997; Monroe and Hadjiyannakis, 2002). Some individuals may be more prone to such events, because of the way they behave or communicate. We hypothesized that a poor nonverbal match during social interaction increases risk of recurrence (partly) because it contributes to the occurrence of stressful life events.

METHODS

Sample and design
The study sample and design has been described in detail by Bos et al. (2005). In brief, the sample consisted of 101 outpatients whose depression had remitted less than 6 months ago (non-psychotic major depressive disorder or dysthymic disorder; DSM-IV, American Psychiatric Association, 1994). The psychiatrists’ diagnosis was confirmed by means of the Composite International Diagnostic Interview (CIDI, lifetime version; World Health Organization, 1997). Remission was established by means of the Beck Depression Inventory (BDI; Beck et al., 1961). The remission criterion was: a BDI score of 8 or less for 2 consecutive times, with a 4-week interval in between (see Frank et al., 1991). At baseline (T0), the Hamilton Rating Scale for Depression interview was conducted to get an external judgement of residual symptom severity (HRSD, 21-item version; Hamilton, 1967). This interview was videotaped for later analysis of nonverbal behavior. Interviewers were 3 trained research workers, 1 male and 2 female.
During the 2-year follow-up, BDI scores were assessed 4-weekly by mail. If BDI scores rose above 14 for 2 consecutive times (see Frank et al., 1991), the CIDI (12-months version) was conducted to establish recurrence of depression. In case the CIDI indicated recurrence, further follow-up assessments were cancelled. At 6, 12, 18, and 24 months after T0, and after a recurrence, stressful life events and medication use in the preceding 6 months were assessed by means of self-report questionnaires.

**Stressful life events**

Stressful life events were assessed by means of the Dutch version of the List of Threatening Experiences (LTE), a self-report questionnaire that examines the occurrence of stressful life events over the previous 6 months (Brugha et al., 1985). The LTE comprises 12 major categories of stressful life events. For each event, subjects can record whether it occurred and in which month. The questionnaire shows acceptable levels of reliability and validity, and comparisons with the interview-based Life Events and Difficulties Schedule (LEDS) showed that the list covers most events rated by interviewers as having a marked or moderate long-term contextual threat (Brugha and Cragg, 1990).

As we were interested in whether the occurrence of stressful life events may be influenced by the way individuals communicate with others, we divided the events into two categories: “interpersonal” and “non-interpersonal”. This subdivision was largely based on the dependency/independency distinction as frequently used by other authors (e.g., Kendler et al., 1999), but besides takes into account whether interpersonal interactions may have played a role. Interpersonal events are defined as those events that may (partly) be the result of the individual’s behavior in interpersonal interactions (breaking off a steady relationship; divorce; having a serious problem with a close friend, neighbor, or relative; being sacked from a job; becoming unemployed or seeking work unsuccessfully (5 items)). Non-interpersonal events are defined as those events that reasonably can be considered as not (or only very indirectly) related to the individual’s behavior in interpersonal interactions (serious illness or injury; serious illness or injury happened to a close relative; death of a parent, child, or spouse; death of a close friend or relative; major financial crisis; problems with the police or court; loss of valuables (7 items)).
**Nonverbal behavior**

The first 15 minutes of the videotaped HRSD interview were used for the analysis of nonverbal behavior. Two trained scorers registered behavior of participants and interviewers by means of an event-recording system. The mean interrater and intrarater reliability (kappa; Cohen, 1968) were 0.88 (range 0.68–0.96) and 0.90 (range 0.76–0.99), respectively. Separate behavioral elements were recorded in separate runs of the videotape. Frequencies and durations of the behaviors were registered, relative to a subject’s speaking and listening.

We focused on behavioral elements indicative of involvement in the interaction, as nonverbal expressions of involvement are considered central to the accomplishment of satisfactory interactions (Coker and Burgoon, 1987). Different sets of behavioral elements were recorded for participants and interviewers. The choice of these specific sets of behaviors was based on a previous factor-analytic study by Bouhuys and colleagues (Bouhuys and Van den Hoofdakker, 1991; Geerts et al., 1995), and was in line with the literature on involvement behavior (e.g., Coker and Burgoon, 1987). The factor “participant involvement” consisted of gesticulations, general head movements, and gaze. The factor “interviewer involvement” consisted of yes-nodding and verbal backchannel (see Bos et al., 2005, for the exact composition of the factors). The thus composed involvement factors have been shown to be positively associated (Bouhuys and Van den Hoofdakker, 1991) and causally related to each other (Geerts et al., 1997). A good match between the factors has been related to a favorable course of the depression (Geerts et al., 1996; Geerts, et al., 2000; Bos et al., 2005).

**Statistical analysis**

To examine associations between nonverbal behavior and the occurrence of stressful life events, we investigated two aspects of the life events: 1. *number of events*, i.e. the total number of stressful life events experienced during the follow-up. This measure was divided by follow-up time to adjust for individual differences in time spent in follow-up; 2. *time to event*, i.e. the time until the first stressful life event occurred. For tests on the first aspect we used linear regression analysis. For tests on the second aspect we used Cox proportional hazards regression analysis (Cox, 1972). The latter analysis yields hazard ratios with 95% confidence intervals, indicating by how much the behavioral variables raise the instantaneous probability (hazard) of a stressful life event.
Time to event was defined as the interval in weeks after T0 until the occurrence of the first stressful life event. Observations of participants who did not experience a stressful life event within the 2-year follow-up were considered censored.

Cox proportional hazards regression analysis was also used to examine associations between behavioral variables and onset of recurrent depressive episodes. In this case, hazard ratios indicate by how much the behavioral variables raise the instantaneous probability of recurrence. Time to recurrence was defined as the interval in weeks after T0 until onset of the new depressive episode according to the follow-up BDI scores. Observations of participants who did not experience a recurrence within the 2-year follow-up were considered censored.

Cox regression for time-varying covariates was used to analyze whether stressful life events predicted recurrent episodes. This approach takes into account when a stressful life event occurs. The occurrence of a stressful life event was binary coded and used as the time-dependent covariate. This implies that the instantaneous probability of recurrence before a stressful life event is compared with the probability after that event. Multiple events occurring within the same month were considered as one. As the events can be assumed to produce long-term threat, the time-dependent event variable was coded 1 over a 6-months period of time (the period most often used in life-events research). In case of a new event later in the follow-up, the same procedure was employed. Since empirical studies on the speed of decay of the effect of a stressful life event show considerable variation in results (e.g., Sundin and Horowitz, 2003), we also explored models in which the effect of an event was assumed to last twice as short (3 months) or twice as long (12 months).

All analyses were adjusted for gender. In analyses with behavioral variables, the interviewer was also adjusted for. Interactions with gender were investigated as well. Since no significant gender interactions were found, gender-interaction terms were removed from the final models. The level of significance was set at 0.05 (two-sided).

RESULTS

Table 1 shows the general characteristics of the study sample. Twenty-eight (28%) of the 101 participants experienced a recurrent episode within 2 years.
after T0 (15 female, 13 male). The majority (75%) of these recurrences occurred during the first year. Gender, age, BDI score at T0, HRSD score at T0, and use of antidepressant medication at T0 were not significantly related to time to recurrence (Cox regression analyses). Discontinuation of antidepressant medication during the follow-up was also not related to time to recurrence (Cox regression analysis with the use of antidepressant medication as a time-dependent covariate).

**Table 1  Sample characteristics (n = 101)**

<table>
<thead>
<tr>
<th>Diagnosis (DSM-IV)</th>
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<tbody>
<tr>
<td>Major depressive disorder (n, %)</td>
<td>99 (98%)</td>
</tr>
<tr>
<td>Dysthymic disorder (n, %)</td>
<td>2 (2%)</td>
</tr>
<tr>
<td>Double depression (n, %)</td>
<td>17 (17%)</td>
</tr>
<tr>
<td>Female (n, %)</td>
<td>61 (60%)</td>
</tr>
<tr>
<td>Age at T0 (mean, range)</td>
<td>44.5 (24–66)</td>
</tr>
<tr>
<td>BDI score at T0 (mean, range)</td>
<td>3.8 (0–8)</td>
</tr>
<tr>
<td>HRSD score at T0 (mean, range)</td>
<td>4.6 (0–15)</td>
</tr>
<tr>
<td>Antidepressant medication at T0 (n, %)</td>
<td>71 (70%)</td>
</tr>
<tr>
<td>Discontinuation of antidepressant medication (n, %)</td>
<td>20 (20%)</td>
</tr>
</tbody>
</table>

**Stressful life events**

Seventy-four of the 101 participants (73%) experienced one or more stressful life events during the follow-up. Altogether, the participants reported 192 stressful life events. The mean number of events experienced during 1 year of follow-up was 1.4 (SD = 1.7, range = 0–8.7). The mean number of events of the interpersonal type was 0.5 a year (SD = 0.9, range = 0–4.3). The mean number of events of the non-interpersonal type was 0.9 a year (SD = 1.4, range = 0–8.7). Thirty-six participants (36%) experienced one or more events of the interpersonal type. Sixty-five participants (64%) had one or more events of the non-interpersonal type. Twenty-seven participants (27%) experienced both types of events.
Nonverbal behavior and the occurrence of stressful life events

We suggested that a poor nonverbal match between interaction partners contributes to the occurrence of stressful life events. We tested this hypothesis by regressing the occurrence of stressful life events during the follow-up on the nonverbal behavior of the conversation partners as measured at T0 (using the factors “participant involvement” and “interviewer involvement” and the interaction between these factors as the determinants). We first investigated the influence of nonverbal behavior on the number of events (total number of stressful life events adjusted for follow-up time). Not the levels of participant and interviewer involvement as such, but the interaction between the two was significantly related to the number of events (linear regression, participant involvement x interviewer involvement: $\beta = -0.25$, $t = -2.43$, $p = .017$). This was true for events of the interpersonal type (participant involvement x interviewer involvement: $\beta = -0.28$, $t = -2.77$, $p = .007$), but not for events of the non-interpersonal type (participant involvement x interviewer involvement: $\beta = -0.13$, $t = -1.23$, $p = .222$). A similar pattern of results was found when we investigated the influence of nonverbal behavior on time to event (time after T0 until a first stressful life event occurred). The interaction between participant and interviewer involvement was particularly related to time to interpersonal events (Cox regression, participant involvement x interviewer involvement: HR = 0.17, CI = 0.05–0.54, $p = .003$). No relationship with time to non-interpersonal events was found (participant involvement x interviewer involvement: HR = 0.76, CI = 0.36–1.62, $p = .467$). Only a trend was found when all events were considered (participant involvement x interviewer involvement: HR = 0.48, CI = 0.22–1.03, $p = .058$). To summarize, the interaction between the levels of nonverbal involvement behavior of the conversation partners was related to both the number of stressful life events and the time of their first occurrence, and this was particularly true for events of the interpersonal type.

To get more insight in the observed interaction effects, we divided the participant and interviewer involvement factors into lower and higher halves (median splits). This yielded 4 different combinations of levels of involvement behavior within dyads (low-low, low-high, high-low, and high-high). We pooled the interviews in which the participant and the interviewer showed congruent levels of involvement behavior (low-low and high-high) and those in which the participant and the interviewer showed incongruent levels of involvement behavior (high-low and low-high). Figure 1 depicts the number of...
and the time to interpersonal events, separately for these “congruent” and “incongruent” groups. As can be seen from the upper panel of the figure, the number of interpersonal events was about 3 times as high for participants of dyads with incongruent levels of involvement behavior. The lower panel of the figure shows that the hazard of experiencing an interpersonal event was

Figure 1 The occurrence of interpersonal events as a function of the incongruity of levels of nonverbal involvement behavior within dyads (n = 101). Upper panel: number of interpersonal events. Lower panel: proportion of participants experiencing one or more interpersonal events in relation to follow-up time. “Congruent behavior”: participant involvement and interviewer involvement both high (or both low). “Incongruent behavior”: participant involvement low and interviewer involvement high (or vice versa).
about 2 times as high for these participants. Thus, a poor nonverbal match between conversation partners was indeed related to the subsequent occurrence of stressful life events.

Stressful life events and recurrence of depression

Table 2 presents the Cox regression analyses concerning the association between stressful life events and recurrence of depression. The table shows 3 different models, one in which the effect of an event was assumed to last 6 months (our starting-point model), and two alternative models in which the effect of an event was assumed to last 3 and 12 months, respectively. As can be seen from the table, the differences between the models were small. In all 3 models stressful life events were predictive of recurrence beneath the .01 level of significance. We concluded that our choice for a 6-months model was a reasonable one and applied this model in all further analyses.

In the 6-months model, the hazard ratio connected to stressful life events was 3.29. This implies that the instantaneous probability of recurrence of depression increased 3.29-fold after the occurrence of a stressful life event. Table 3A shows the results for the different subcategories of events. Particularly events of the interpersonal type were related to recurrence of depression; interpersonal events increased the hazard of recurrence 4.57-fold. Non-interpersonal events were not significantly related to time to recurrence.

<table>
<thead>
<tr>
<th>Model</th>
<th>HR</th>
<th>95% CI</th>
<th>p</th>
<th>-2LL</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 months</td>
<td>2.93</td>
<td>1.39–6.18</td>
<td>.005</td>
<td>242.2</td>
</tr>
<tr>
<td>6 months</td>
<td>3.29</td>
<td>1.51–7.17</td>
<td>.003</td>
<td>240.3</td>
</tr>
<tr>
<td>12 months</td>
<td>3.77</td>
<td>1.58–9.04</td>
<td>.003</td>
<td>239.4</td>
</tr>
</tbody>
</table>

1 Effect of an event assumed to last 3, 6, and 12 months, respectively. Models adjusted for gender. HR = hazard ratio; CI = confidence interval; -2LL = -2 log-likelihood.

Nonverbal behavior and recurrence of depression

Table 3B presents our earlier finding on the association between the joint nonverbal involvement behavior of conversation partners and recurrence of depression (see Bos et al., 2005). The interaction between the levels of partici-
pant and interviewer involvement was significantly related to time to recurrence, not the individual levels of involvement. The nature of the interaction was such that the more congruent the levels of involvement behavior of participants and interviewers, the lower the hazard of recurrence. In other words, a poor match between the conversation partners' nonverbal involvement behavior was predictive of early recurrence.

**Table 3** Cox regression analyses predicting time to recurrence on the basis of stressful life events and nonverbal involvement behavior of participants and interviewers

<table>
<thead>
<tr>
<th></th>
<th>HR</th>
<th>95% CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Stressful life events</strong>&lt;sup&gt;1&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpersonal events</td>
<td>4.57</td>
<td>2.14–9.74</td>
<td>.000</td>
</tr>
<tr>
<td>Non-interpersonal events</td>
<td>1.83</td>
<td>0.85–3.94</td>
<td>.120</td>
</tr>
<tr>
<td><strong>B. Behavior</strong>&lt;sup&gt;2&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant involvement</td>
<td>0.73</td>
<td>0.35–1.52</td>
<td>.393</td>
</tr>
<tr>
<td>Interviewer involvement</td>
<td>0.97</td>
<td>0.50–1.88</td>
<td>.938</td>
</tr>
<tr>
<td>Participant x interviewer involvement</td>
<td>0.26</td>
<td>0.07–0.88</td>
<td>.031</td>
</tr>
<tr>
<td><strong>C. Behavior and interpersonal events</strong>&lt;sup&gt;2&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpersonal events</td>
<td>4.00</td>
<td>1.83–8.72</td>
<td>.001</td>
</tr>
<tr>
<td>Participant involvement</td>
<td>0.73</td>
<td>0.34–1.56</td>
<td>.418</td>
</tr>
<tr>
<td>Interviewer involvement</td>
<td>0.96</td>
<td>0.51–1.81</td>
<td>.892</td>
</tr>
<tr>
<td>Participant x interviewer involvement</td>
<td>0.39</td>
<td>0.11–1.42</td>
<td>.153</td>
</tr>
<tr>
<td><strong>D. Behavior and non-interpersonal events</strong>&lt;sup&gt;2&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-interpersonal events</td>
<td>1.66</td>
<td>0.76–3.62</td>
<td>.201</td>
</tr>
<tr>
<td>Participant involvement</td>
<td>0.72</td>
<td>0.35–1.49</td>
<td>.377</td>
</tr>
<tr>
<td>Interviewer involvement</td>
<td>1.01</td>
<td>0.52–1.96</td>
<td>.986</td>
</tr>
<tr>
<td>Participant x interviewer involvement</td>
<td>0.28</td>
<td>0.08–0.96</td>
<td>.043</td>
</tr>
</tbody>
</table>

<sup>1</sup> Univariate analyses, adjusted for gender.

<sup>2</sup> Multivariate analyses, adjusted for gender and interviewer.

**Mediation**

We subsequently investigated whether the occurrence of stressful life events mediated the relationship between a poor nonverbal match and recurrence of depression. Therefore, we ran the model of Table 3B again, now including
stressful life events. Table 3C shows the results for the model with events of the interpersonal type. As can be seen, the interaction between participant and interviewer involvement was not significant anymore in this multivariate model. The corresponding regression coefficient was reduced by 46%. Interpersonal events were still significantly associated with time to recurrence. Thus, interpersonal events mediated part of the association between nonverbal involvement behavior and recurrence of depression.

Table 3D shows the results for the model with events of the non-interpersonal type. No mediatory effect of the stressful life events was found in this case. The interaction between participant and interviewer involvement remained significantly associated with time to recurrence, and the corresponding regression coefficient was not changed by a considerable degree (< 10%).

Part of the association between a poor nonverbal match and recurrence of depression could thus be explained by the fact that the former is related to a higher incidence of interpersonal events. Figure 2 illustrates this finding. The figure shows that recurrence was observed almost twice as often in the group of participants whose interviews were characterized by incongruent levels of involvement behavior. A relatively high proportion of these participants also

\[ \text{Recurrence of depression} \]

\[ \text{No. of participants} \]

\[ \text{congruent behavior} \quad \text{incongruent behavior} \]

**Figure 2** Recurrence of depression as a function of the incongruity of levels of nonverbal involvement behavior within dyads (n = 101). The black part of the bars denotes the number of participants who experienced both a recurrence and one or more interpersonal events. “Congruent behavior”: participant involvement and interviewer involvement both high (or both low). “Incongruent behavior”: participant involvement low and interviewer involvement high (or vice versa).
had experienced one or more interpersonal events during the follow-up (67% of the “incongruent” group, against 30% of the “congruent” group).

DISCUSSION

This study showed that problems in nonverbal communication are related to a higher subsequent exposure to stressful life events, and –via this route– to a higher risk of recurrence of depression; a poor match between the levels of nonverbal involvement behavior of remitted depressed outpatients and their conversation partners was predictive of the subsequent occurrence of stressful life events, particularly of events that were interpersonal in nature. Stressful life events in turn were predictive of recurrence of depression.

Poor nonverbal communication contributes to the occurrence of stressful life events

Our results support the notion that stressful life events do not always occur at random but may arise from the individual's own behavior. Thus far, this notion particularly found support from studies showing that certain personality dimensions like neuroticism are related to a higher exposure to stressful events (e.g., Ormel and Wohlfarth, 1991; Van Os et al., 2001). The value of the present study is that we related event exposure to what individuals actually do. Our measure consisted of direct observations of the individual's behavior during a conversation. Such measure does not suffer from the subjectivity that is inherent to the self-report questionnaire, the tool most often used in life-events research. Moreover, in contrast to a neuroticism score, behavioral assessments may provide information about why some individuals generate more stressful life events than others do.

We focused on the individual's behavior during interpersonal interaction. Interpersonal stress is an important risk factor in depression, and social support is an important protective factor (Joiner and Coyne, 1999). Our study showed that especially the result of the interplay between interaction partners' behavior was indicative of the subsequent occurrence of stressful life events. When levels of nonverbal involvement behavior of participants and interviewers were well adjusted to each other, the participant less frequently encountered a stressful life event during the follow-up. A good nonverbal match between interaction partners thus may avert stressful events. Such is
well conceivable in the light of some central elements of human communication theory. First, nonverbal behavior is very important in interpersonal communication, at least as important as the spoken word (Depaulo and Friedman, 1998). Secondly, mutual adjustment of nonverbal behavior is a very common aspect of normal human interaction. It can be seen in, for example, posture mirroring, facial mimicry, movement synchrony, and congruence of mean levels of behavior, and is related to feelings of mutual affiliation, rapport, and satisfaction (Tickle-Degnen and Rosenthal, 1987; Bernieri and Rosenthal, 1991). Whereas mutual adjustment of nonverbal behavior of interaction partners contributes to the success of an interaction, interactions likely become inconvenient and stressful when interaction partners do not “get it together”. Eventually this may culminate in stressful life events as the ones reported in the present study. That we found this to be the case exclusively for events of the interpersonal type makes the result even more convincing, since these events were defined as those that may result from the individual’s behavior during interpersonal interactions.

**Stressful life events predict recurrence of depression**

Our finding that stressful life events increase risk of recurrence of depression is not new, but nevertheless important. Most evidence on the depressogenic effect of stressful life events concerns first onsets of depression. Studies that specifically focus on recurrence in remitted patients are scarce (Monroe and Hadjiyannakis, 2002). Such studies are relevant since the role of stressful life events (and the role of the patient as a potential stress generator) may change over time with recurrences of the disease (Harkness et al., 1999; Kendler et al., 2000; Ormel et al., 2001). Our study besides had the advantage of a prospective design, and remission as well as recurrence were well defined and established.

We found that stressful life events of the interpersonal type were more potent predictors of recurrence than events of the non-interpersonal type were. One explanation for this finding is that interpersonal events were more likely a consequence of the individual’s own behavior (as this was implicated in the definition). Therefore, these events may more easily give rise to feelings of guilt, incompetence, and reduced self-esteem. Such feelings may in turn contribute to the development of depressive symptomatology (Roberts and Monroe, 1999). This explanation is in line with general evidence that events which may have resulted from the individual’s own behavior (“dependent”
events) are more strongly associated with subsequent depression than “independent” events are (e.g., Kendler et al., 1999).

One may dispute the validity of our subcategories of stressful life events. Some events categorized as “interpersonal” could in fact have occurred independently of the individual's behavior in interpersonal interactions, while some “non-interpersonal” events could have been an (indirect) result of it. We agree. We categorized the events according to the likelihood that they are influenced by the individual's interpersonal behavior. Thus, the distinction between our categories is a gradual one and not based on the participants' information. This is a drawback inherent in the use of a simple questionnaire. We nevertheless feel confident about the findings, since nonverbal behavior was related to stressful life events also when we did not subdivide the events.

Stressful life events mediate between poor nonverbal communication and recurrence of depression

Our earlier finding that a poor nonverbal match between remitted patients and their interviewers is indicative of increased risk of recurrence has not been an isolated one. Our research group showed that lack of mutual adjustment of nonverbal behavior also impedes improvement of the depression in depressed patients (Geerts et al., 1996; Geerts et al., 2000). We thus far interpreted these findings by reference to the relevance of well-adjusted nonverbal behavior to the success of interpersonal interactions (see above), and the importance of inadequate interpersonal interactions and lack of social support in the etiology of depressive disorder (e.g., Joiner and Coyne, 1999). We assumed that dysfunctional interpersonal skills, such as the inability to get at the same nonverbal “wavelength” with one's interaction partners, increase risk of depression because they increase the likelihood that interpersonal interactions become problematic and stressful. We now have evidence that this is the case. We found that stressful interpersonal events mediated part of the relationship between poorly adjusted nonverbal behavior and recurrence of depression. Thus, a poor nonverbal match during social interaction increases risk of depression (partly) via its contribution to the occurrence of stressful life events.
CLINICAL IMPLICATIONS

- A good nonverbal match during social interactions can protect against recurrence of depression by preventing stressful life events.
- The occurrence of stressful life events depends in part on the remitted patient’s own behavior during social interactions.
- Particularly what happens in the interplay between patients and others is important.

LIMITATIONS

- Nonverbal behavior was measured in an experimental setting, which may not be representative for everyday social interaction.
- The degree of congruence between levels of involvement behavior within dyads could be determined only with reference to the levels of involvement behavior as displayed by other dyads.
- The assessment of stressful life events was restricted to a simple self-report questionnaire.

ACKNOWLEDGMENT

We are grateful to Ingrid Van der Spoel for her help in the data collection, especially for her efforts to keep participants involved during the follow-up of the study.
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