Expressed emotion
A review of assessment instruments

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Abstract

Expressed emotion (EE) refers to the quality of the emotional climate between a relative and a family member with a serious psychiatric disorder. Well-established, it has proven to be a reliable predictor of the relapse rate of psychiatric patients. In this article, the Camberwell Family Interview (CFI), the standard instrument, and 11 alternative EE measures will be presented and discussed with regard to their psychometric properties. It is concluded that the CFI remains the best instrument for assessing the quality of the relationship. © 2001 Elsevier Science Ltd. All rights reserved.

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1. Introduction

A substantial amount of research has been done on the influence of the family climate on the course of severe mental illnesses such as schizophrenia as assessed by the construct of expressed emotion (EE) (Kuipers & Moore, 1995). EE refers to the affective attitudes and behaviors (criticism, hostility, and emotional overinvolvement (EOI)) of a significant other toward a psychiatric patient (Brown & Rutter, 1966; Kazarian, 1992; Leff & Vaughn, 1985; Vaughn & Leff, 1976a). It has proven to be a reliable and robust predictor of the illness.
outcome of patients with severe psychiatric disorders like schizophrenia, mood disorders, eating disorders, and dementia (Brown, 1958; Butzlaff & Hooley, 1998; Kavanagh, 1992; Wearden, Tarrier, Barrowclough, Zastowny, & Armstrong Rahill, 2000). Patients living in a high-EE environment have significantly more risk of relapse than do patients in a low-EE environment. Based on this research, many family intervention programs have been developed to reduce the family’s EE level and, thus, to decrease the relative’s relapse ratio (De Jesus Mari & Streiner, 1994; Dixon, Adams, & Lucksted, 2000; Kuipers, 1992; Pharaoah, Mari, & Streiner, 1999). Over the last 10 years, EE research expanded to include the study of the quality of the emotional climate between the patient and his or her professional caregiver. Here, too, the construct of EE is used to evaluate the emotional climate (e.g. Kuipers & Moore, 1995; Moore & Kuipers, 1992, 1999; Oliver & Kuipers, 1996; Snyder, Wallace, Moe, & Liberman, 1994; Tattan & Tarrier, 2000; Van Humbeeck et al., 2001).

The Camberwell Family Interview (CFI) was the first instrument that assessed the emotional climate and is now considered the golden standard (Brown & Rutter, 1966; Rutter & Brown, 1966; Vaughn & Leff, 1976b). However, because it takes so much time to administer and code, many alternative instruments have been developed to replace it (cf. infra). The purpose of the present study is to review these instruments.

The plan of this review is as follows. Section 1 describes our research method. In Section 2, the semistructured interviews are presented, and Section 3 contains the EE questionnaires. This section is divided into three parts: (1) questionnaires for patients; (2) questionnaires for the significant others; and (3) questionnaires for both parties. Section 4 presents recommendations for researchers and for clinical practice.

2. Method

We used the keywords “expressed emotion” and “instrument” to do a computerized search in MEDLINE and PsycLIT/PsycINFO for the period between 1958 and 2000. In total, 15 instruments were found, of which three were not available in English: (1) Fragebogen zur Erfassung der Familienatmosphäre (Feldmann, Buckremer, Minneker-Hügel, & Hornung, 1995, German); (2) Familiefragebogen (Feinstein’s study, as cited in Hansson & Jarbin, 1997, German); and (3) Fragor om Familjemedlemmar (Hansson & Jarbin, 1997, Swedish). They were excluded from this review because of the language problem. The remaining 12 instruments were identified and evaluated in function of (a) information gathering, (b) source of information: patients, relatives or both, (c) psychometric properties, and (d) other factors like origin of the instrument, administration, and coding.

3. Review of EE instruments

3.1. Interviews

In this section, we first discuss the CFI and then describe the Five Minute Speech Sample (FNSS) and the Patient Interview for Assessing Patient’s Perceptions of Family Relationships (PPI) (see Table 1).
3.1.1. The Camberwell Family Interview

Brown (1958), Brown, Birley, and Wing (1972), Brown, Carstairs and Topping (1958), Brown, Monck, Carstairs and Wing (1962), and Rutter and Brown (1966) developed the CFI. This semistructured interview is now the standard instrument for assessing the emotional climate between a patient and a significant other, and it is generally administered to a key relative shortly after a patient’s admission in the hospital. The aim of the interview is to gather factual and attitudinal information about the onset and development of the present illness episode, the illness history, the frequency of irritability and quarreling, the patient’s symptomatology, the quality of the relationship, and the amount of contact between the patient and his or her relative (Vaughn & Leff, 1976a, 1976b). The interviewer remains neutral in order to allow the relative time to talk freely about his or her difficulties, problems, and relationship. While the administration of the original instrument required up to 5 or 6 h (Brown et al., 1972), it currently takes 1 1/2 h (Vaughn & Leff, 1976a, 1976b).

A qualified rater then codes the audiotaped CFI on five scales: (1) critical comments (a frequency count); (2) hostility (a four-point scale: 0–3); (3) positive remarks (a frequency count); (4) EOI (a six-point scale: 0–5); and (5) warmth (a six-point scale: 0–5). The scores for hostility, warmth, and EOI are global evaluations rated at the end of the interview. Relatives are classified as high on the EE index if they make six or more critical comments, if

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Number of scales</th>
<th>Cut-off score (low vs. high EE)</th>
<th>Internal consistency</th>
<th>Test-retest reliability</th>
<th>Concurrent validity (comparison with the EE instruments)</th>
<th>Predictive validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) CFI</td>
<td>5</td>
<td>Criticism ≥ 6</td>
<td>≥ 0.80</td>
<td>NA*</td>
<td>e.g. psychophysiological and interactional studies</td>
<td>r = .30, P &lt; .0001</td>
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<td></td>
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<td>Hostility ≥ 1</td>
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<td></td>
<td></td>
<td>EOI ≥ 3</td>
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<tr>
<td>(2) FMSS</td>
<td>8 scales</td>
<td>Criticism: 1st statem. neg; relat.</td>
<td>≥ 0.80</td>
<td>r = .64</td>
<td>CFI: 20–30% underestimation</td>
<td>No prediction of relapse with dichotomous classification; prediction of relapse when borderline group is a part of the high-EE group (χ² = 6.59; df = 1, P &lt; .02)</td>
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<td></td>
<td>and 2 main scales</td>
<td>neg or crit</td>
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<td>comm ≥ 1</td>
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<tr>
<td>(3) PPI</td>
<td>3</td>
<td>None</td>
<td>0.86–0.92</td>
<td>NA</td>
<td>FMSS: marginal consistency (F = 2.65, χ² = 4.19, df = 3.29, P &lt; .07)</td>
<td>Only for Pc</td>
</tr>
</tbody>
</table>

* NA means not available to the authors’ knowledge.
they are hostile (score 1–3), and/or if they have a score of 3 or more on the EOI scale. These criteria are not fixed, but can be modified depending on the population (Leff & Vaughn, 1985; Vaughn & Leff, 1976b).

The hostility scale significantly overlaps with the criticism scale, for hostility is almost always accompanied by an amount of critical comments above the threshold. Warmth and positive comments correlate negatively with the criticism scale (Vaughn & Leff, 1976b).

Psycho-physiological (Tarrier & Barrowclough, 1984; Tarrier, Barrowclough, Porceddu, & Watts, 1988; Tarrier, Vaughn, & Lader, 1979) and interactional research (Hahlweg et al., 1989; Hooley, 1986; Kuipers, Sturgeon, Berkowitz, & Leff, 1983) support the construct validity of the CFI, especially for the criticism scale. In the initial studies, it was shown that high-EE relatives had an arousing effect on the patient, while low-EE relatives calmed them (Tarrier & Barrowclough, 1984; Tarrier et al., 1988a, 1979). The latter studies described significant correlations between high-EE, criticism, and a criticism score obtained in face-to-face interactions (Hahlweg et al., 1989; Hooley, 1986).

The CFI is a strong and robust relapse predictor. In a meta-analysis, 27 studies were screened on the relationship between EE and relapse in samples of patients with schizophrenia or a mood disorder (Butzlaff & Hooley, 1998). In 24 studies (89%), this relationship was significant. Butzlaff and Hooley (1998), however, argue that these findings have to be replicated using regression analysis or path analysis. The most predictive scales are criticism and EOI (Butzlaff & Hooley, 1998; Kavanagh, 1992; Vaughn & Leff, 1976b, Wearden et al., 2000), which are considered to be the key scales of the CFI, together with the hostility scale.

Chambless, Bryan, Aiken, Steketee, and Hooley (1999) investigated the underlying factor structure of the CFI scales. Based on a sample of 104 outpatients with agoraphobia or an obsessive–compulsive disorder and a sample of 104 healthy relatives, they found a three-factor model. This model had good statistical fit and contained the factors criticism, positivity, and EOI (Chambless et al., 1999).

Mueser, Bellack, and Wade (1992) developed a short version of the CFI. The criticism, EOI, and warmth scales of their instrument significantly correlated with the same scales of the original CFI. However, to our knowledge, no other research group has utilized this abbreviated CFI.

A modified version of the CFI, the Relative Assessment Instrument (RAI), is used in clinical practice (Barrowclough & Tarrier, 1992). This instrument allows the practitioner to decide which interventions might be effective for a particular family and which might not be. Behavioral–cognitive intervention programs based on the answers of the RAI have proved to be beneficial for a large group of high-EE relatives and patients. This effect lasts up to 8 years after the original intervention (Tarrier, Barrowclough, Porceddu, & Fitzpatrick, 1994; Tarrier et al., 1988b, 1989).

Because of the good predictive power of the CFI and the richness of the CFI material, it is a very good instrument for assessing the affective climate between a family member and his or her key relative. Despite these positive characteristics, the CFI is not used in all EE studies. Two major issues argue against the instrument. First, one needs extensive training in the administration and the coding of the instrument. This means that candidate raters have to obtain an interrater reliability of at least 0.80 for the cut-off score (high and low) and for the different
scales. In addition, the interview and its coding are very time consuming: it takes at least 3 h to administer and to code one CFI. Second, a relative always has to be recruited, which can be a problem. Often, patients do not have relatives anymore or do not want to involve their families. To resolve these problems, alternative instruments have been developed.

3.1.2. The Five Minute Speech Sample

The first alternative instrument with the purpose of reducing the length of the CFI interview, is the FMSS (originally of Gottschalk & Gleser, 1969; modified by Magana et al., 1985). In this interview, a key relative is asked to speak freely for 5 min about his or her sick family member after he or she has heard the following instruction: “I’d like to hear your thoughts about [patient’s name] in your own words and without my interrupting you with any question or comments. When I ask you to begin, I would like you to speak for 5 min, telling me what kind of a person [patient’s name] is and how the two of you get along together. After you have begun to speak, I prefer not to answer any questions. Are there any questions you would like to ask me before we begin?” (Magan, et al., 1985, p. 205). Both the instructions and the interview are audiotaped. A qualified rater then codes the sample for four dimensions: (1) quality of the initial statement; (2) quality of the relationship; (3) criticism; and (4) EOI. There are thus no scales for warmth and hostility. A relative is classified as high EE, critical, if he makes one or more critical comment or if the relationship or the first sentence is negative. One or more of the following attitudes defines a relative as high EE, EOI: (1) self-sacrificing or devoted behavior; (2) emotional display during the interview; or (3) two or more of the following characteristics: excessive details from the past, one or more statements of attitude, and five or more positive remarks (Magan, et al., 1985).

In a family context, the FMSS underestimates the score of the CFI in 20–30% of the samples. This means that a high-EE score on the FMSS implies a high score on the CFI, but a low-EE relative is not necessarily low on the CFI (Leeb et al., 1991; Magana et al., 1985; Malla, Kazarian, Barnes, & Cole, 1991; Van Furth, Van Strien, van Son, & van Engeland, 1993). Moore and Kuipers (1999) assessed the EE of staff with both the CFI and the FMSS. In this study, they found an overall agreement of 89.7% between the two measures (Moore & Kuipers, 1999).

There is no strong evidence for the predictive power of the FMSS. A significant correlation emerged between high EE and relapse in a sample of depressed children (Asarnow, Goldstein, Tompson, & Guthrie, 1993), but no significant correlations were found for schizophrenic patients (Nugter, 1997; Tompson et al., 1995; Uehara et al., 1997). When borderline EE relatives (=relatives with a score of a dubious negative relationship, a dubious critical comment, dubious self-sacrificing behavior or a statement of attitude) were part of the high-EE group, the picture changed. Then, the high-EE group was more apt to relapse than the low-EE group (Uehara et al., 1997). Therefore, McGuire and Earls (1994) suggested that the borderline group had more characteristics in common with the high-EE group than with the low-EE group. Using the Mokken scale analysis, Lenior, Dingemans, and Linssen (1997, 1998) created two new FMSS scales: criticism/satisfaction and EOI. Preliminary research with this new instrument yielded a positive relationship between the criticism/dissatisfaction scale and the patients’ relapse ratio. However, to our knowledge, the
Table 2
Summary of the statistics of the questionnaires that assess EE: patients

<table>
<thead>
<tr>
<th></th>
<th>Number of items</th>
<th>Number of scales</th>
<th>Response alternatives</th>
<th>Cut-off score (low vs. high EE)</th>
<th>Internal consistency</th>
<th>Test–retest reliability</th>
<th>Concurrent validity</th>
<th>Predictive validity</th>
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<tbody>
<tr>
<td>(1) LEE</td>
<td></td>
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<tr>
<td>English version</td>
<td>60</td>
<td>4</td>
<td>2</td>
<td>Median</td>
<td>0.84–0.89</td>
<td>0.67–0.82</td>
<td>CFI: CC of the CFI and intrusiveness (r=0.40, P&lt;0.05) and tolerance (r=0.40, P&lt;0.05)</td>
<td>Only for the total score (\chi^2=9.58, P&lt;0.5) and the intrusiveness scale (\chi^2=7.25, P&lt;0.01)</td>
</tr>
<tr>
<td>Dutch version</td>
<td>38</td>
<td>4</td>
<td>4</td>
<td>Median</td>
<td>0.65–0.93</td>
<td>NA</td>
<td>CFI, FMSS: unknown</td>
<td>Only for the total score (r=-0.64, P&lt;0.05), criticism (r=-0.59, P&lt;0.05), irritability (r=-0.52, P&lt;0.05)</td>
</tr>
<tr>
<td>(2) IRQ</td>
<td>37</td>
<td>3</td>
<td>4</td>
<td>None</td>
<td>0.76–0.91</td>
<td>0.53–0.85</td>
<td>CFI, EOI and criticism of the IRQ (r=0.48, P&lt;0.05)</td>
<td>Discriminate between relapse and no relapse (different studies: (0.03 \leq P \leq 0.001) (r=0.64, P&lt;0.001)</td>
</tr>
<tr>
<td>(3) PCS</td>
<td>2</td>
<td>–</td>
<td>10</td>
<td>≥4</td>
<td>–</td>
<td>(r=0.75, P&lt;0.001)</td>
<td>PCS and cut-off score of the CFI (r=0.51, P&lt;0.05)</td>
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<tr>
<td>(4) FEICS</td>
<td>14</td>
<td>2</td>
<td>5</td>
<td>None</td>
<td>0.76–0.82</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>
instrument has not been used in other studies. Tattan and Tarrier (2000) used the FMSS to predict patient outcomes in a case-management setting. In this study, too, there was no significant correlation between high-EE and poor clinical outcome. Still, the authors reported a significant positive association between a poor relationship and the patient’s quality of life (Tattan & Tarrier, 2000).

Even though the FMSS is less time consuming than the CFI, it still engages a relative, and the interview needs to be coded by a qualified rater. In addition, a low-EE score on the FMSS does not imply a low-EE score on the CFI, and the predictive power of the instrument remains unclear. Therefore, it may not be the most suitable alternative for the CFI.

3.1.3. The Patient Interview for Assessing Patient Perceptions of Family Relationships

Mintz et al. developed the PPI (cited in Tompson et al., 1995), which was originally not an EE instrument. A qualified rater collects information from the patient on three kinds of relatives’ behaviors: criticism (=relationship difficulties, unrealistic expectations, disagreement with the relative, and conflicts); EOI (=overprotection, worries, involvement in the patient’s interpersonal relationships and intrusiveness); and nagging. The instrument consists of three scales with good internal consistency: (1) perceived criticism; (2) perceived EOI; and (3) the family members’ perceived nagging. In one study, the concurrent validity with the FMSS was examined, and only its perceived criticism scale was found to be positively correlated with the criticism scale of the FMSS. There is no further information available concerning the concurrent validity with other EE instruments. Only the perceived criticism scale of the PPI predicted psychotic exacerbation of patients after 1-year follow-up (Tompson et al., 1995).

This instrument assesses the perceived EE from patients. No relatives are interviewed. However, there is no guarantee that the patient does not reply in a socially desirable way. However, a significant correlation between the criticism scales of the PPI and of the FMSS indicates otherwise. Still, the time required for the assessment and the necessity of a qualified rater hinders the application of the instrument.

3.2. Questionnaires

Questionnaires developed to replace the CFI are presented in this section. First, we will describe the questionnaires that assess EE from the patients’ perspective (see Table 2). Next, the EE instruments from the relatives’ perspective are discussed, and, finally, an instrument for both groups will be reviewed (see Table 3).

3.2.1. Assessment by the patients

In this survey, four questionnaires are examined: (1) Level of Expressed Emotion (LEE); (2) Influential Relationships Questionnaire (IRQ); (3) Perceived Criticism Scale (PCS); and (4) Family Emotional Involvement and Criticism Scale (FEICS).

3.2.1.1. Level of Expressed Emotion. This self-report questionnaire measures the perceived EE of a schizophrenic patient (Cole & Kazarian, 1988). The item selection was based on a
<table>
<thead>
<tr>
<th></th>
<th>Number of items</th>
<th>Number of scales</th>
<th>Response alternatives</th>
<th>Cut-off score (low vs. high EE)</th>
<th>Internal consistency</th>
<th>Test-retest reliability</th>
<th>Concurrent validity</th>
<th>Predictive validity</th>
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<tr>
<td><strong>Assessment by relatives</strong></td>
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<td>(1) PRS Limited version</td>
<td>11</td>
<td>1</td>
<td>3</td>
<td>None</td>
<td>0.78</td>
<td>0.72</td>
<td>NA</td>
<td>Related with rehospitalization 18 months after discharge ($r=0.20$, $P&lt;.05$)</td>
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<tr>
<td>Modified version</td>
<td>24</td>
<td>1</td>
<td>7</td>
<td>None</td>
<td>0.89</td>
<td>NA</td>
<td>CFI: overlap with CC and H</td>
<td>Related with relapse ($X^2=8.27$, $df=1$, $P&lt;.05$)</td>
</tr>
<tr>
<td>(2) QAEE</td>
<td>99</td>
<td>2</td>
<td>4</td>
<td>Criticism $&gt;87/210$ EOI $\geq 44/87$</td>
<td>0.90–0.96</td>
<td>NA</td>
<td>CFI: criticism: 88% ($r=0.75$, $P&lt;.05$); EOI: 67% ($r=0.11$, ns); total: 76% ($r=0.53$, $P&lt;.5$)</td>
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<td>(3) AC</td>
<td>20</td>
<td>2</td>
<td>8</td>
<td>None</td>
<td>Negative adj: 0.88–0.92</td>
<td>NA</td>
<td>CFI: neg adjectives: EE, crit $&gt;$ EE, EOI ($P&lt;0.01$) EE, crit $&gt;$ EE, low ($P&lt;.05$)</td>
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<td>Positive adj:</td>
<td>FMSS: * neg adj:</td>
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<td>0.91–0.94</td>
<td>EE, crit&gt;EE, EOI</td>
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<td>EE, crit&gt;EE, low (P &lt; .001)</td>
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<td>crit&lt;EE, EOI (P &lt; .01) EE,</td>
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<td>crit&lt;EE, low (P &lt; .01)</td>
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<td>(4) FAS</td>
<td>30</td>
<td>1</td>
<td>5</td>
<td>None</td>
<td>0.95</td>
<td>NA</td>
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<td>High EE level,</td>
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<td>higher score on</td>
<td>the FAS (mothers; t = 1.64;</td>
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<td>the FAS</td>
<td>df=52; P = .05; fathers,</td>
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<td>mothers, t = 2.70, df=52,</td>
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<td>fathers t = 1.99;</td>
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<td>df=47; P &lt; .05).</td>
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**Assessment by relatives and patients**

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<tbody>
<tr>
<td>No fixed internal consistency, depending on the sample</td>
<td>No fixed internal consistency, depending on the sample</td>
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<td>CFI: no association</td>
<td>NA</td>
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**FES**

<table>
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<tr>
<th></th>
<th>90</th>
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study of Vaughn and Leff (1981) that suggested that there were four dimensions that could discriminate between high and low EE. These were (1) intrusiveness, (2) emotional response, (3) negative attitude towards the illness, and (4) tolerance and expectations concerning the patient. Cole and Kazarian (1988) formulated 15 true-or-false questions for each component. Scores are calculated for these four scales as is a total score. A family member is classified as high EE when his or her score lies above the median (Cole & Kazarian, 1993). The four scales have good internal consistency, good test–retest reliability, and good temporal stability. The scale scores are independent of age, gender, and contact hours (Cole & Kazarian, 1988). Only its intrusiveness and tolerance/expectation scales are significantly correlated with the critical comment scale of the CFI (Kazarian, Cole, Malla, & Baker, 1990). The total LEE score (Cole & Kazarian, 1993; Donat, 1996) and the intrusiveness scale (Donat, 1996) predict rehospitalization.

Using factor analysis, Gerlsma, van der Lubbe, and van Nieuwenhuizen (1992) argued that the a priori classification in four scales could not be maintained. Their factor analysis revealed only three scales: lack of emotional support, intrusiveness, and perceived irritability. Moreover, the original instrument contained no items for criticism, so they added five new items. There is no information available for its test–retest reliability or its concurrent validity with the CFI or another EE instrument. The predictive validity of the modified LEE was demonstrated in a sample of depressed patients. The study indicated that the criticism scale, the irritability scale, and the total EE score were good predictors for the course of the complaints during treatment (Gerlsma, 1998, Gerlsma & Hale III, 1997).

The LEE examines the perceived EE from the patient’s perspective. Whereas the CFI assesses the actual verbal behavior of a family member, the LEE stresses on the sick relative’s perception. Although the instrument can be a good alternative for the CFI, more effort needs to be invested to establish its concurrent validity. Gerlsma et al. (1992, 1998) attempted to modify and to improve the LEE. They developed a statistically good instrument, but this modified instrument has, to our knowledge, not been used in other studies.

3.2.1.2. Influential Relationships Questionnaire. The IRQ of Baker, Helmes, and Kazarian (1984) is another alternative questionnaire for the EE assessment. This paper-and-pencil questionnaire, inspired by the Parental Bonding Instrument (Parker, Tupling, & Brown, 1979), asks the patients to rate the behavior of the two most important persons towards them. The IRQ consists of 37 items divided over three scales: criticism, care, and protection. Some hostility items are integrated in the criticism rating.

No information is provided about the cut-off score for the classification into high or low EE. The three scales have good internal consistency and good test–retest reliability. The concurrent validity of the instrument was studied with regard to the CFI. A significant correlation only between the EOI scale of the CFI and the criticism scale of the IRQ was demonstrated. This association is surprising, but Kazarian et al. (1990) explain it by noting that the criticism scale is not very homogenous and also includes EOI items. The IRQ has good predictive power. In particular, the care and the criticism scale can discriminate between patients who relapse and those who do not (Baker, Kazarian, &
Helmes, 1987; Baker, Kazarian, & Marquez, 1994). The predictive power of the IRQ has also been demonstrated in two samples of physically ill patients. In these studies, the scores on the IRQ could predict psychiatric complaints (Baker et al., 1994; Clarke, Walker, & Cuddy, 1996).

This instrument easily identifies criticism/hostility, care, and overprotection. The conceptual relation with the original EE construct remains unclear because its development was not based on an EE instrument. Thus, the concurrent validity has not been proven. Still, it has good predictive power.

3.2.1.3. The Perceived Criticism Scale. Hooley and Teasdale (1989) developed the PCS. This instrument originally was used to assess the amount of perceived criticism of depressive patients’ spouses. The patient is asked the following two questions: (1) How critical do you think you are of [name of relative]? and (2) How critical do you think [name of relative] is of you? His answers range from “1” (not at all critical) to “10” (very critical indeed) and the cut-off score is fixed on a score of 4 or more out of 10. The instrument has good temporal stability and good concurrent validity with the CFI. There is a significant correlation between the scale scores on the PCS and the global level of EE (high vs. low). The PCS is independent of the patients’ symptomatology, but there is a significantly negative correlation with social functioning (Riso, Klein, Anderson, Ouimette, & Lizardi, 1996). Nine months after the assessment, the two items proved to be a good predictor of the relapse ratio of patients with a unipolar depressive disorder. A score of 2 or less predicted no relapse, a score of 6 or more predicted a 100% relapse rate. In addition, the predictive power of the PCS was stronger than the predictive power of the CFI (Hooley & Teasdale, 1989).

To our knowledge, the PCS has only been applied in samples of patients with a unipolar depressive disorder except in the study of Chambless et al. (1999). In this study, a sample of outpatients with agoraphobia or an obsessive-compulsive disorder and a sample of their healthy relatives was questioned with the PCS.

The ease of administration and scoring, the clear breaking point, the good concurrent validity, and the predictive validity are in favor of the PCS. However, although the PCS conceptually seems to be associated with the criticism scale of the CFI, Hooley and Teasdale (1989) found no significant correlations between these two scales. In addition, the predictive validity of the PCS needs to be replicated in a sample of schizophrenic patients. Still, we believe that the PCS is a good alternative for the CFI.

3.2.1.4. Family Emotional Involvement and Criticism Scale. Shields, Franks, Harp, McDaniel and Campbell (1992) developed the FEICS, a questionnaire that contains the two core components of EE: criticism and EOI. The original instrument was composed of 40 items, but the definitive version consisted of two scales with seven items each: a perceived criticism scale and a perceived EOI scale. The revision of the instrument was based on item review and factor analysis. The aim of this questionnaire is to assess the relative’s behavior towards the patient. These behaviors are scored on a five-point Likert scale ranging from “1” (almost never) to “5” (almost always). The instrument has no clear cut-off score, but the internal consistency of the two scales is good. We are not aware of research concerning the temporal
stability of the FEICS, its concurrent validity with the CFI, or its predictive power (Shields Franks, Harp, Campbell, & McDaniel, 1994). The perceived criticism scale negatively correlates with the cohesion scale and the adaptation scale of the Family Adaptability and Cohesion Evaluation Scales (Olson et al., 1985) and with all the scales of the Interpersonal Support Evaluation List (Cohen & Hoberman, 1983). Furthermore, income and education are negatively correlated with the criticism scale, whereas the perceived EOI scale is positively correlated with these sociodemographic variables (Shields et al., 1992).

Gavazzi, McKeny, Jacobson, Julian, and Lohman (1999, as cited in Gavazzi, McKeny, Jacobson, Julian & Lohman, 2000) presented a four-factor interpretation of the instrument by using structural equation modeling procedures. These factors were perceived criticism, perceived EOI, family members’ approval, and upset feelings. Gavazzi et al. (2000) used this instrument to investigate the relationship between EE, verbal aggression, and marital quality in a sample of 152 married couples. In this study, the authors found evidence that EE is indirectly associated with verbal aggression (male and female) through marital quality. However, there was no direct relationship between EE and marital quality (Gavazzi et al., 2000).

Although EOI and criticism were the starting point of this questionnaire, the authors of the FEICS did not study its concurrent validity with the CFI. In addition, no other researchers have used the instrument. Because we do not have information about the concurrent and the predictive validity of the FEICS, it is not clear whether the FEICS is a good alternative for the CFI. Further research is recommended.

3.2.2. Assessment by the relatives

This section presents the questionnaires for the healthy relatives. The following instruments are discussed: (1) Patient Rejection Scale; (2) Questionnaire Assessment of Expressed Emotion (QAAEE); (3) Adjective Checklist (AC); and (4) Family Attitude Scale (FAS).

3.2.2.1. Patient Rejection Scale

The Patient Rejection Scale exists in two versions: an abbreviated (PRS, Kreisman, Simmens, & Joy, 1979) and a more extended form (PRS-1, Kreisman et al., 1988), which are both based on the CFI. The PRS (11 items) examines the relatives’ criticism and rejection. The larger PRS-1 (24 items) also assesses aspects like love, acceptance, and disappointment. The later dimensions are not original EE components and EOI is not measured. A higher score on both instruments indicates a higher level of criticism and hostility (PRS and PRS-1), more love and acceptance, and less disappointment (PRS-1). A cut-off score is not available. Kreisman et al. (1979, 1988) suggest that answers on the questionnaires could be an underestimation of the family members’ true feelings of rejection. Indeed, relatives sometimes feel ashamed to admit that they are critical of their ill relatives. This criticism, of course, applies to all self-report questionnaires. The internal consistency of the two instruments is good, but only the PRS offers information for the temporal stability.

Although the development of both instruments is based on the CFI, their concurrent validity has yet to be studied. Lebell et al. (1993) examined the concurrent validity of the PRS-1 with the Dyadic Adjustment Scale (Spanier & Thompson, 1982) and the Parental Bonding Instrument (Parker et al., 1979), two questionnaires that chart the relationship
between patients and relatives. In this study, the total PRS-1 score was highly correlated with the patients' perception of their families' attitudes (Lebell et al., 1993). The predictive power of the PRS was studied in a sample of schizophrenic patients. Kreisman et al. (1979) found moderate but significant correlations between the PRS and rehospitalization within 18 months after discharge. Although Lebell et al. (1993) state that the PRS-1 is not a good predictor for the patient's outcome, its rejection scale can predict relapse time (Kreisman et al., 1988).

Both the abbreviated and the extended version of the PRS are easy to administer and to code and have good internal consistency. There is some conceptual overlap between the hostility and the rejection scales of the CFI and the PRS and the PRS-1. While the CFI indirectly probes for expressions of hostility and rejection, the PRS(-1) asks directly. The concurrent validity between the PRS(-1) and the CFI needs to be examined. Because of the moderate predictive validity of the PRS(-1), these questionnaires can assess the relative's criticism and hostility and the impact on the patient's functioning.

3.2.2.2. Questionnaire Assessment of Expressed Emotion

Another alternative EE instrument is the QAAE, developed by Docherty, Serper, and Harvey (1990). The formulation of the items on the questionnaire was inspired by (1) a content analysis of the CFI answers and (2) the four correlates of Vaughn and Leff (1981) (cf. supra). Using factor analysis, the initial instrument (144 items) was reduced to a questionnaire with 99 items and two scales: criticism/hostility (70 items) and EOI (29 items).

In this questionnaire, family members have to indicate how often they conduct a specific behavior towards the patient. Their answers range from "0" (never or almost never) to "3" (always or almost always). The authors provide a clear cut-off score and the two scales are highly internal consistent, but this can be due to the large item set (Docherty et al., 1990). The concurrent validity with the CFI was studied, and a correspondence of 76% for the distinction between high and low EE was found. The criticism scale of the QAAE correctly classified 88% of the relatives on the criticism scale of the CFI. In addition, 67% of the highly emotionally overinvolved family members had a high EOI score on CFI. These results, however, need to be replicated. The predictive validity of the QAAE has not yet been examined (Docherty et al., 1990).

It is possible that the QAAE is a good alternative for the CFI, but more information concerning its psychometric properties has to be generated.

3.2.2.3. Adjective checklist

The AC of Friedmann and Goldstein (1993, 1994) is a self-report questionnaire for family members. Twenty adjectives, 10 with a positive value (loving, good-natured, friendly, devoted, easy to get along with, cooperative, considerate, clear, accepting, and active) and 10 with a negative one (rude, mean, lazy, irritable, irresponsible, hostile, deceitful, contrary, bored, and angry) were generated from a brainstorming meeting involving the EE components of criticism and EOI. These adjectives are alphabetically presented to the family members and have to be scored twice. The first time, the relatives have to assess their behavior towards the patients; the second time, the behavior of the patients towards them.
The internal consistency of the positive and the negative scale is high, but there is no cut-off score for high or low EE. The concurrent validity of the instrument was studied with the CFI and the FMSS. There was a significant correlation between the subgroups of the CFI (low; high, critical; high, EOI) and the score on the negative adjective scale. This means that the high EE, critical individuals rated themselves significantly higher on the negative adjectives than the high-EE, EOI relatives and the low-EE relatives. There were no significant associations between the CFI subgroups and the positive adjective scale. The concurrent validity with the FMSS was more pronounced. For both the positive and the negative adjective scale, a significant correlation was found. Friedmann and Goldstein (1993) concluded, therefore, that the AC could differentiate between high EE, criticism, high EE, EOI, and low EE as measured with the FMSS. In addition, they also found some positive correlations with the relatives’ affective and coping styles. The predictive validity of the AC remains unclear (Friedmann & Goldstein, 1994).

These 20 adjectives offer a good idea of the relationship between a patient and his relative. Therefore, the instrument can be a good starting point for studying the relationship more in depth. Because of the good internal consistency of both scales and the concurrent validity with the CFI and the FMSS, it can be an alternative for these two measures. Its predictive validity still needs to be studied.

3.2.2.4. Family Attitude Scale

The FAS was generated on the basis of existing questionnaires, the EE literature, and the know-how of experienced clinicians (Kavanagh et al., 1997). The FAS (30 items) assesses the family member’s amount of criticism and hostility. EOI items were not included because these items did not correlate with the total questionnaire. The internal consistency of the instrument is high, but no information is available about the cut-off score and the temporal stability. The FAS is compared with the CFI. This comparison indicates that high EE on the CFI (low vs. high) is associated with a higher score on the FAS in samples of schizophrenic patients’ relatives. Moreover, high EE, criticism is significantly correlated with a higher FAS score. The concurrent validity with the State–Trait Personality Inventory (STPI, Spielberger et al., 1983, cited in Kavanagh et al., 1997) was studied in a student sample. This study gives evidence for a significant correlation between the FAS and the STPI. No data are available for the predictive validity of the instrument (Kavanagh et al., 1997).

When one is interested in relative’s hostility and criticism level, the FAS can be a used, but there is no clear cut-off point for high or low EE.

3.2.3. Assessment by the patient and his relative

The Family Environment Scale (FES, Moos & Moos, 1981) is the only instrument that assesses the emotional climate of both the patient and his or her relative. The FES consists of 90 true-or-false statements divided over three dimensions. The first dimension (relationship) contains three scales: cohesion; expressiveness; and conflict. The second dimension (personal growth) has five scales: independence; achievement orientation; intellectual and cultural orientation; active and recreational emphasis; and moral or religious emphasis. The main-
tendence of the system, the third dimension, consists of two scales: organization and control (Moos & Moos, 1981; Spiegel & Wissler, 1986; Vostanis & Nicholls, 1995). The scales have good internal consistency and temporal stability, which depend on the sample (Jacob & Tennenbaum, 1988; Moos, 1990; Roosa & Beals, 1990). There is no clear cut-off point for the classification into a high- or a low-EE group, and there is no evidence for concurrent validity with the CFI. Schnur, Friedmann, Dorman, Redford, and Kesselman (1986) did find a weak correlation between the conflict and the expressiveness scale of the FES and the criticism and the EOI scale of the CFI. These two scales can discriminate between patients with more than three admissions in the hospital and patients with fewer than three admissions. More research has to be done on its predictive power.

Because both patients and relatives have to be involved and because of the length and the coding time of the instrument, the FES is not commonly used to assess the emotional climate.

4. Discussion

For more than 40 years, the influence of the social environment on the course of psychiatrically ill patients has been studied by means of the construct of EE. The first instrument to assess the amount of EE was the CFI. Its criticism, EOI, and hostility scales are very predictive for the relapse rate of patients with schizophrenia and patients with other psychiatric disorders such as mood disorders and eating disorders (Wearden et al., 2000). However, the time-consuming administration and coding limits widespread utilization. Therefore, several attempts have been made to develop alternative instruments. We have reviewed these instruments with special attention to their internal consistency, test–retest reliability, concurrent validity with the CFI, and predictive validity in terms of clinical outcome. It was not easy to compare these EE instruments because the reports often concern different subject groups (schizophrenia, mood disorder, healthy persons) and different statistical analyses.

We described 12 instruments: three of them were interviews (the CFI, the FMSS, and the PPI) and nine were questionnaires. Some of these questionnaires assessed the relative’s perception (PRS, AC, QAE, FES), others the patient’s perception (LEE, IRQ, PCS, FEICS), and one instrument assessed both perspectives (FES).

The CFI, the FMSS, the PCS, the QAE, and the LEE are the only instruments that have a clear cut-off score to classify a relative into high or low EE. For the other instruments, no such information is available. The instruments with the best predictive power are the CFI, the PCS, and the LEE. The predictive validity of the other instruments is poorer (e.g. FMSS, PRS) or unknown (e.g. AC, FEICS, QAE, FAS). The most predictive scales turn out to be criticism and hostility, the EOI scale being less sensitive for relapse. There is a strong overlap between the PCS, the LEE, and the CFI.

Based on this survey, it is possible to make some recommendations for the application of these instruments in clinical practice and for research purposes. Although the CFI indeed is very time consuming and its administration requires a relative or a professional, it still remains the best instrument for assessing EE for both researchers and clinicians. Indeed, the
CFI allows relatives and professionals to talk freely not only about their relationship but also about their own difficulties and bottlenecks. The much shorter FMSS does not have this advantage and the time saved may well be a false economy in some situations. Indeed, one may well be interested in the relative’s difficulties and therefore one has to ask in addition a whole set of questions specially to obtain this kind of information. With the CFI, one can gain background information concerning the relationship and the illness history. Often, psychiatric patients live at home and are cared for by their relatives. Many things can be done to reduce the amount of EE in high EE relatives and thus to decrease the relapse rate. Based on the CFI, Barrowclough and Tarrier (1992) developed the Relative Assessment Interview, which gathers information about which intervention is the most suitable for a particular family. Intervention programs based on the results of the assessment with the RAI have reduced the relapse ratio of patients living in a high-EE environment (Tarrier et al., 1988b, 1989, 1994). Thus, in counseling and psychotherapy, the CFI can be seen as a good starting point for a family intervention program.

The CFI is considered to be the best instrument for research if the psychometric properties of the different instruments are taken into account. Researchers especially interested in the relationship between EE and relapse should use the CFI as it has the best predictive validity. However, not every researcher has the time to assess the emotional climate with the CFI and must thus turn to alternative instruments. Based on the internal consistency, the concurrent validity, and the predictive validity of these other instruments, the following instruments are recommended: the LEE, the PCS, and the PRS. The LEE and the PCS have a clear cut-off point for high and low EE. They are administered to the patient and do not need a relative. Both instruments are predictive for clinical outcome, and the LEE has good internal consistency. If a researcher wants to explore the emotional climate of the relative, then the PRS can be a good instrument. In addition, the FMSS can be administered, but its training needs and its underestimation of high EE argues against its use as the only alternative. Nevertheless, when a researcher is interested in the broad screening of a population, then it can be useful. Research has indicated that EE can also be studied in the relationship between the patient and his or her professional caregiver. Good alternatives for the CFI in this context are the PCS and the FMSS. In this context, EOI seldom occurs, therefore, the FMSS and the PCS are good instruments for picking up the amount of criticism and dissatisfaction.

We recommend other instruments for clinical practice. It is important that clinicians have information about the patient’s functioning and about his or her relationship with significant others. This information cannot be provided by questionnaires only. Indeed, questionnaires do not pick up important cues or nonverbal material. Therefore, we recommend the FMSS as the best alternative instrument despite its training requirement, its need for a relative, and its underestimation of high EE. The FMSS provides a clearer understanding of the relationship between a relative and a patient than a questionnaire does. Based on the responses to the FMSS, actions can be devised to improve this relationship. Other instruments that can be used are the LEE, the PCS, the AC, and the PRS. How patients perceive their relatives (PCS, LEE) can influence the way they behave toward these relatives. If a clinician is interested in the relatives, then the PRS and the AC can be used. The hostility and the criticism items of the
PRS are predictive for relapse, and the items of the AC can help the relatives become aware of the positive sides of the patient.

Different research groups have tried to explain the significant correlation between EE and the relapse rate. Nowadays, the unidirectional models have been abandoned. These causal models state that EE causes relapse (Brown et al., 1972; Leff & Vaughn, 1985) or that EE is an epiphenomenon (Kavanagh, 1992). It is now argued that there is a complex circular relationship between EE and relapse. Examples of these models are the vulnerability-stress model (Ferriter, 1999; Nuechterlein et al., 1994; Wearden et al., 2000), the transactional model (Kavanagh, 1992), and the causal attribution theory (Barrowclough, Johnston & Tarrier, 1994; Hooley, 1998; Wearden et al., 2000). This theory states that the relatives' beliefs about schizophrenia account for the difference between the high- and the low-EE groups. In a study by Barrowclough, Johnston, and Tarrier (1994), it was found that highly critical relatives considered the patient's behavior to be controllable and idiosyncratic to the patients, whereas the low-EE relatives attributed the patient's behavior to be uncontrollable. These attitudes can be measured with the CFI but not with the alternative EE questionnaires.

5. Conclusion

Since the CFI was devised, many alternative instruments have been developed in an effort to replace this instrument. These attempts have not been successful, and the CFI still remains the best instrument. After all that is said and done, we must concur with Hooley and Richters (1991). They state that, although some instruments have a strong concurrent validity with the CFI, they may not be powerful enough to predict relapse. For them “the time now seems to be ripe for a shift in attention away from EE itself and towards predictors of relapse more generally. Developing a good EE analogue is neither as easy, nor arguably as desirable, as it appears at first glance, and indeed may be more self-limiting than most researchers believe” (Hooley & Richters, 1991, p. 97).

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References


