Assessing expressed emotion: comparing Camberwell Family Interview and Five-minute Speech Sample ratings for mothers of children with behaviour problems

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Abstract

Little is known of the concordance between ratings of expressed emotion (EE) derived from the Camberwell Family Interview (CFI) and Five-minute Speech Sample (FMSS) for parents of children with behaviour problems. Concordance between CFI and FMSS ratings of EE was assessed prior to intervention and compared to parent-rated behaviour after intervention, at follow-up, 12 months later. Female primary caretakers of 75 children (3–10 years) showing behavioural difficulties were interviewed using FMSS and CFI. Interviews were coded independently by criterion-standard raters. Using CFI, 57 families were classified high EE, and 18 low EE. Using FMSS, 65 families were classified high EE and 10 low EE. 55/75 pairs of ratings (73%) were the same (high, $n = 51$; low, $n = 4$) and 20 mothers (27%) were allocated different EE status ($Kappa = 0.14$, *n.s.*). The FMSS ratings at initial interview appeared more closely related to behaviour rating at follow-up than CFI. Further investigation is required to establish comparability of CFI and FMSS results for carers of children. Copyright © 2006 John Wiley & Sons, Ltd.

Key words: expressed emotion, child, behaviour, parent, family

Introduction

Expressed emotion (EE) is used to describe the emotional quality of relationships and is generally assessed using the Camberwell Family Interview (CFI) or Five-minute Speech Sample (FMSS). The CFI-EE rating (Vaughn and Leff, 1976a) has been extensively researched (Wearden et al., 2000) but is lengthy to interview and code. The FMSS (Magana et al., 1986) is quicker. Although the majority of studies of EE in families of children and adolescents

use FMSS methodology (for example, Jacobson et al., 2000; Peris and Baker, 2000; Daley et al., 2003), the extent to which these procedures yield the same EE classification for parents talking about children is not clear. A parenting intervention (Harrington et al., 2000) where both CFI and FMSS were used enabled examination of the association between the measures. Relationship of EE rating to parent-rated behaviour scores at follow-up was examined.

*Sarah Peters collected the data for this study as part of her PhD work while a student in the Division of Child Psychiatry at the University of Manchester. Rachel Calam and Sarah Peters were both responsible for the conception and design of the study. Both have contributed to the drafting and revision of the manuscript, and both have approved the final version.

Methods

Participants

The National Health Service Local Research Ethics Committee granted approval. Consecutive referrals of 75 children reaching DSM IV criteria for Conduct Disorder (CD) or Oppositional Defiant Disorder (ODD) were identified by child mental health service team members in the north-west of England. The decision on whether children met criteria for ODD or CD was made by a senior psychiatrist or clinical psychologist, prompted by a standardized checklist of DSM IV criteria including symptoms (Harrington et al., 2000). Primary diagnosis was as follows: ODD, 35 children (46.7%), ADD, 5 (6.7%), ADD and ODD, 10 (13.3%), CD and ODD, five (6.7%), CD and ADD, five (6.7%), 'behaviour/parenting difficulties', 15 (20%). Thirty-three children (44%) were originally primary care referrals to a child psychiatry outpatient department at a major teaching hospital; 23 (31%) were referred by clinical psychology services; eight (11%) by community paediatrician; seven (9%) by social services; three were referred directly to the study by their health visitor and one by educational services. All the families who were approached agreed to take part ($N = 75$).

The age at which parents first noticed a problem ranged from birth ($n = 11$, 15%) to 84 months (7 years) ($n = 2$, 3%). Median age of onset was 24 months (2 years). Time between onset and date of referral to the study ranged from 8 months to 114 months (9 years and 6 months) with a mean of 54 months (4 years and 6 months). Older children were rated as having had a behavioural problem for longer ($r = 0.44$, $p < 0.001$). Age of onset was unrelated to child's current age ($\rho = 0.23$, n.s.).

The majority of the children ($n = 71$) were either in full-time mainstream education or attended a pre-school nursery. Two children had been excluded from school because of behavioural difficulties. Two children were too young to attend school. Six families (8%) were receiving disability living allowance because of the severity of the child's behavioural difficulties. Eight children (11%) were being prescribed methylphenidate (Ritalin) as treatment for attention deficit disorder at the time of referral.

Family structure

For most children ($n = 73$, 98%) the primary carer was their biological mother. One stepmother and one adoptive mother participated. Forty-two mothers (56%) were

currently married or cohabiting. Of the 33 single mothers, 14 (19%) were divorced or separated; one was widowed. Most (83%) children lived with another sibling. Most commonly, this was one sibling (42%); 22 (29%) lived with two siblings; nine (12%) with three or more siblings; 13 (17%) no siblings. One child was a twin. Thirty (40%) were eldest; 15 (20%) youngest, and 16 (21%) middle children. Thirty-five children had always lived with their biological father (47%); 16 (21%) had regular contact with their own father. Of these, two children lived with a stepfather. Seven children lived with a stepfather or adopted father, but had no contact with biological father. Seventeen (23%) children had no regular contact with the father or a stepfather.

Age of mothers and children

Mothers' ages ranged from 22 to 44 years (mean 31 years; $s.d. = 5$). Mean age of the children was 83 months ($s.d. = 19$) with a range of 36 to 120 months. Eighty-one per cent of the children ($N = 61$) were male, 19% ($N = 14$) female.

Parental work and socio-economic status

The study took place in an area with high deprivation indices. Socio-economic status (SES) was calculated for each family by converting the highest ranking current occupation or last main paid occupation of the mother or father to a classification of social class using the Standard Occupational Classification (Office of Population, Censuses and Surveys, 1995). (See Table 1).

Maternal interview

Mothers were interviewed at home. Interviews were tape-recorded. Mothers were interviewed first using the FMSS procedure, then the CFI. They were interviewed where possible in the absence of other family members. No interviews were recorded in the presence of the index child. Assessments were repeated at follow-up, 12 months later.

Assessment of CFI-EE

As suggested by Scott and Campbell (2001) the CFI interview schedule was modified to be applicable to younger children (Bolton et al., 2003). Questions about daily routine were altered in order to make these age-appropriate for the children in the study. This included, for example, waking, dressing, mealtimes, after-school activities and bedtime. Symptoms in the original CFI

Table 1. Employment and socio-economic status

	n	%		n	%
<i>Mother's work status (n = 75)</i>			<i>Family Benefits (n = 75)</i>		
Full-time parent	40	53	Income support/family credit	41	55
Full-time employment	8	11	Sickness benefit	8	11
Part-time employment	20	27	No low income benefits	26	34
Sickness/invalidity benefit	7	9			
<i>Father's work status (n = 42)</i>			<i>Family Social class (n = 75)</i>		
Full-time parent	3	7	I Professional	1	1
Full-time employment	22	52	II Managerial/technical	15	20
Part-time employment	3	7	III Skilled non-manual	18	24
Self-employed	3	7	III Skilled manual	13	17
Sickness/invalidity benefit	9	22	IV Partly skilled	21	28
Unemployed	2	5	V Unskilled	5	7
			Never worked	2	3

were changed to reflect common emotional and behavioural disorders in children, for example sleep-related problems, non-compliance, aggression or violence, temper tantrums, overactivity or underactivity, anxiety and depression. Sections on household tasks and finances were removed. Areas from the 'relationship' section of the CFI were made age-appropriate. Relationships with close adults other than parents were also explored. Guidelines for rating EE from the CFI are summarized below (see Leff and Vaughn, 1985).

Rating EE from the CFI

Criticism

The criticism scale comprises a frequency count of critical comments. A critical comment is defined as 'a statement which, by the manner in which it is expressed, constitutes an unfavourable comment upon the behaviour or personality of the person to whom it refers' (Leff and Vaughn, 1985: 38). Critical comments are determined by the *content* of the statement, for example 'she acts like a horrible spoilt brat'. If tone is sufficiently critical, a statement can qualify as a criticism regardless of content. In this study the conventional threshold of six critical comments was used.

Hostility

Hostility is rated on a four-point scale. Although evidence for the rating comes from the entire interview, a single hostile comment is sufficient to justify a rating. Hostility indicates dislike or rejection of the child as a

person. Statements that are rated for hostility as rejection indicate a frank dislike about the child, for example 'I leave him with his dad because at times I can't bear to be near him.'

Emotional overinvolvement (EOI)

This is rated on a six-point scale based on evidence provided during the interview. Scores of 3 or above lead to a high EE rating. Evidence for EOI comes from behaviours or statements of attitude that the mother reports and from her behaviour as observed during the interview. Reported behaviour includes:

- exaggerated emotional response, for example *I couldn't sleep because I kept worrying if he would get enough to eat at school and about how he'd cope with those new strange children;*
- self-sacrificing behaviour; and
- overprotective behaviour.

Observed excessive concern is also rated and includes emotional display and dramatization.

Adaptation of EE-CFI methodology for current study
In addition to ensuring that the CFI schedule was age appropriate, modifications were made to the guidelines for rating EOI (Bolton et al., 2003). These modifications were made following discussions with Christine Vaughn (first author of the original abbreviated CFI) and are similar to those reported by (Hodes et al.,

1999a) when assessing EE in children using the CFI methodology (details available on request). An example of age-specific behaviour was young children sleeping in their mother's bed. This was such common practice within this sample that it was decided not to include this evidence. Emphasis was placed on parental preoccupation and style of speech (for example melodramatic speech and excessive detail) rather than behaviour towards the child. Guidelines were adapted to ensure raters agreed on the modified rating of EOI.

Although warmth and positive comments were rated, they do not contribute towards the final EE index, and are not described here. Reaching threshold on criticisms, hostility or EOI results in a high EE index; otherwise a low EE rating is made.

Inter-rater reliability of CFI-EE methodology

Inter-rater reliability was assessed in two stages: firstly, following training in the traditional rating procedures and, secondly, with another trained CFI rater to ensure reliability with the modified interview and rating system.

Training in administration and rating CFI-EE

One author (SP) was trained by Christine Vaughn in the administration of the CFI and EE coding system. Inter-rater reliability for criterion scales were all above 0.84; good reliability was achieved for all scales and full agreement for overall EE classification (Table 2).

Inter-rater reliability of adaptations (N = 11)

In order to ensure acceptable inter-rater reliability using the modified interview schedule and the changed guidelines for rating EOI, 11 interviews with mothers from the current sample were recoded by a second trained rater using the same system in a similar population (Bolton et al., 2003). Satisfactory inter-rater reliability for the criterion scales was achieved (see Table 2).

Assessment of FMSS-EE

Data from the FMSS were always collected before the CFI data following the exact administration guidelines (Magana-Amato, 1989), where the participant is asked to speak without prompting for 5 minutes. All speech was audiotaped and subsequently transcribed. Not all mothers spoke for the full five minutes but all samples contained sufficient material to permit coding.

Rating EE from the FMSS

The FMSS is rated along the following scales:

- initial statement (positive, neutral or negative);
- critical comments (frequency count);
- quality of relationship (positive, neutral or negative);
- statements of attitude (frequency count);
- emotional display (presence/absence);
- evidence of self-sacrificing, overprotective behaviour or a lack of objectivity;

Table 2. Reliability of ratings as assessed with other trained raters

Scale	Schizophrenia Sample ¹ N = 12	Child Sample ² N = 11
Overall EE classification (high/low)	100% agreement	100% agreement
Critical comments	rho = 0.89	rho = 0.87
Hostility (high/low)	Φ = 0.84 (1 disagreement)	Φ = 0.67 (2 disagreements)
EOI (high/low)	100% agreement	Φ = 0.77 (1 disagreement)
EOI (ordinal data)	not assessed	rho = 0.64
Warmth	r = 0.77	r = 0.77

Reliability assessment undertaken with: ¹C. Vaughn; ²C. Bolton (Bolton et al., 2003).

- excessive detail; and
- frequency of positive remarks.

Presence of dissatisfaction is also noted and contributes towards a borderline rating of critical EE, although in isolation it is insufficient to result in a high EE rating. The definitions of critical comments, positive comments and evidence for EOI are the same as those described earlier for rating EE using the CFI. Individual scales have been used as continuous variables (Lenior et al., 1997).

All FMSSs were transcribed by one of the authors (SP) and rated (from audio and transcript) by an experienced criterion rater (Zaden, University of California, US) who was blind to all information about the mothers and the study hypotheses.

Inter-rater reliability of FMSS-EE ratings

Many of the mothers in this study had strong regional accents and used colloquialisms that were unfamiliar to the US coder. A subset of 20 speech samples were randomly selected and recoded by a second approved rater for purposes of reliability. Raters achieved 100% agreement of high/low status and for classification of CFI subgroups (low, high-critical, high-EOI or high critical and EOI) ($Kappa = 0.97$, $CI = 0.66, 1.13$).

Behaviour rating

Eyberg Child Behaviour Inventory (ECBI) (Robinson et al., 1980) is made up of a list of 36 common behavioural problems. Parents respond yes or no to each item to record whether each of these is currently a problem with their child, and rate how often the specific

behaviour occurs (1–7, *never* to *always* respectively). Scores are totalled for each scale, yielding separate 'problem' and 'intensity' scores.

Results

Of the 75 pairs of ratings, 55 (73%) were allocated the same rating of either high ($n = 51$) or low ($n = 4$) EE using the two methodologies. Twenty mothers (27%) were allocated a different EE status depending on which method of rating was used. This level of agreement between ratings was not statistically significant ($Kappa = 0.14$, n.s., $CI = 0.1, 0.38$). Table 3 presents overall ratings for each method.

Using the CFI methodology (CFI-EE), 57 families were classified as high EE and 18 families were rated as low EE. Using the FMSS methodology (FMSS-EE), 65 families were classified as high and 10 were low. Six of the 57 mothers who were rated as high CFI-EE were classified as low FMSS-EE whilst 14 low CFI-EE mothers were rated as high FMSS-EE.

Due to the small numbers of low EE families, numbers were too small to test for predictive validation with respect to outcome. However, simple t-tests showed that ECBI intensity at follow-up was significantly lower in families initially classified as low FMSS-EE, compared to those classified high EE ($t = -2.08$, d.f. 59, $p = 0.042$). A significant difference was also seen when a similar analysis was carried out using CFI-EE ($t = -2.419$, d.f. 56, $p = 0.019$). Both approaches therefore identified differences in EE at initial interview that was associated with maternal ratings of outcome at follow-up. For descriptive purposes, Table 3 shows the mean ECBI Intensity scores for follow-up for those families for

Table 3. Relationship between CFI and FMSS classifications of EE, showing mean ECBI intensity scores at initial interview ($n = 71$) and follow-up ($n = 61$)

		CFI EE initial interview			
		Low		High	
		Mean	SD	Mean	SD
FMSS initial interview low	ECBI intensity, initial interview	162.4	26.7	162.4	31.7
	ECBI intensity, follow-up	124.9	23.0	135.6	38.3
FMSS initial interview high	ECBI intensity, initial interview	173.1	34.7	183.4	30.1
	ECBI intensity follow-up	155.7	45.9	162.0	39.8

Figure 1. Frequency of critical comments measured from the CFI.

whom ECBI data were available, 12 months later. Initial interview data are included to show baseline. These data again show that both approaches are related to clinical outcome, but that a high FMSS-EE/low CFI-EE is more likely to be associated with higher ECBI scores than is the converse, perhaps indicating higher sensitivity of the FMSS.

The correspondence between CFI and FMSS ratings was further examined by investigating the level of agreement in each of the subtypes of the EE rating (Table 4). The coding schemes for the FMSS and CFI are not identical. For example, in the CFI methodology hostility contributes towards a classification of high EE. Two subscales are unique to the FMSS methodology but contribute towards a high EE rating (initial statement and quality of relationship). Only subscales that were common to both measures were included in the

analysis: critical, EOI and critical and EOI. Figure 1 presents the distribution of critical comments rated from CFIs for the sample.

For 28 cases (37%), subscale ratings were the same. Misses on the FMSS ($n = 22$) were seven critical cases and 15 EOI cases. In contrast, false positives ($n = 23$) made using the FMSS were 14 critical cases and nine EOI cases.

Thirteen cases classified on the FMSS as high EE on the basis of criticism were identified as low EE by the CFI. Because most criticisms are made during the earlier parts of the CFI (Leff and Vaughn, 1985) an analysis was conducted where criticisms rated during the FMSS were included as critical comments using the CFI rating. On this analysis, seven mothers then reached threshold on critical comments and were reclassified as showing high EE on the CFI. Four (5.3%) were classified low by both systems; 58 (77.3%) were classified high by both, with seven (9.3%) rated low on CFI but high on FMSS and six (8%) rated high on CFI and low on FMSS. This level of agreement between ratings (62/75, 83%) then reached statistical significance (Kappa = 0.28, $p < 0.05$, CI = 0.01, 0.55) although this remains a low level of reliability.

Discussion

This study aimed to examine the extent to which EE ratings derived from the CFI and the FMSS were equivalent. The study used a sample of primary female caregivers of children referred for behavioural difficulties drawn from a deprived urban environment, who would be expected to represent a commonly occurring group presenting for child clinical services. The CFI-EE ratings were made using the established CFI procedure and coding scheme, with some modifications in order to make it age-appropriate for parents of 3- to 10-year-old children (Bolton et al., 2003). Modifications were

Table 4. Agreement between EE ratings on the CFI and FMSS

FMSS Ratings	CFI Ratings	Low	Critical	EOI	Critical and EOI	N
FMSS Ratings	Low	4	6	0	0	10
	Critical	13	22	0	15	50
	EOI	1	2	0	1	4
	Critical and EOI	0	6	1	4	11
	N	18	36	1	20	75

approved by one of the originators of the approach and ratings were made by coders trained to criterion standards. The FMSS-EE ratings were made by an independent criterion rater blind to the purpose of the study.

On the basis of the CFI approach, over three-quarters of mothers were classified as high EE. Ratings were primarily made for criticism with only one mother rated high CFI-EE on the basis of EOI only. Using the FMSS methodology, almost 90% of the sample was rated as high EE. This finding contradicts previously published work that found either good levels of agreement (Magana et al., 1986) or a trend towards underreporting in the FMSS (Malla et al., 1991; Van Humbeeck et al., 2002). We found that the FMSS methodology had a lower, rather than higher threshold for EE.

The numbers of families classified as showing low EE were small and we could not therefore undertake analysis but there was some indication that families rated as high on the FMSS-EE but low on CFI-EE were more likely to rate their children as showing higher levels of behavioural difficulty at follow-up than the converse. In choosing between the two approaches, therefore, researchers should be aware that the pattern of findings across studies is not consistent for families with children. The mixed evidence for the predictive power of the FMSS for families with children (Asarnow et al., 1993; Kershner et al., 1996; Van Humbeeck et al., 2002) is a factor that needs consideration in decisions on methodology.

One aspect of the current study that should be noted are the very high levels of EE we found. When compared to other published samples of parents of younger children, it is clear that regardless of the methodology used for assessment, the level of high EE in this sample was considerable. Some studies of families with children and adolescents have lowered the cut-offs used for the classification of EE. For example, Vostanis et al. (1994) used a threshold of five or more critical comments and Hodes et al. (1999b) reduced theirs further to four or more critical comments. If we had followed the models adopted by these studies, the levels of EE and the discrepancy in classification between the CFI and FMSS would have been even greater.

The study has a number of strengths. All the children had been referred, assessed and diagnosed independently of the study. We had a complete inclusion rate for parents invited to take part in the study. The minor modifications to the CFI interview to take account of the age of the children were approved by

one of the originators of the CFI. The CFI ratings were made by psychologists trained to reliability by criterion raters, and the FMSS was fully independently coded by a criterion rater in the US. This gives a high level of confidence that the ratings yielded by the procedures were conducted to the highest possible standard, and highly consistent with literature published by other experts in the field.

The level of agreement between the two approaches to the measurement of EE was such that the methodologies should not be assumed to be interchangeable. It is important to examine possible reasons for this. One suggestion for the low level of agreement found is that it was to some extent an artefact of the research procedure. On close examination of the pattern of agreement of subtypes of ratings it is evident that the largest number of discrepancies was on the category of criticism. In order to prevent contamination from interview or questionnaires it had been decided to always administer the FMSS first, immediately followed by the CFI. This may have led to a lowering the number of critical comments spoken during the CFI. Some support for this explanation was found when the level of agreement between the two methodologies was re-examined including FMSS-EE criticisms in the CFI-EE rating. Analysed this way, there was agreement on classification in 83% of families. It is important to note, however, that while the level of agreement reached statistical significance, reliability was still relatively low. Repeating this study, but collecting the two EE assessments on separate occasions, could clarify this question.

It would be valuable to know more about the performance of these two measures across different samples. Based on our ratings, regardless of methodology, the percentage of families falling into the high EE category was extremely high. Other studies using child psychology and psychiatry referrals have found lower levels. It would be valuable to compare these measures on a larger sample, which incorporates a wider range of families with different levels of EE. There may also be differences depending on the nature of the referred problems. The parents in this sample were very keen to emphasize the level of difficulties that they were experiencing with their children, and often made extremely negative comments about them. They were also drawn from an area of high deprivation, which limits the generalizability of our findings and indicates a need for replication with other samples with a good-sized follow-up. Normative data on EE across different demographic

characteristics, including age of the child, membership of cultural group, and socio-economic status would be helpful in identifying groups that are more likely to show elevated levels of EE, and would provide a framework for developing systematic rules if it is necessary to employ different thresholds to use within different populations. Certainly, the high levels found in our sample compared to other mental health clinic samples would indicate that this kind of framework for classifying families as high EE is needed, particularly as the application of the approach is widened out and modified for use with samples other than patients with presentations of schizophrenia for which it was originally designed.

An important assumption is that the way in which parents talk about their child reflects important aspects of the way that they interact with their child in everyday life. Studies should establish the extent to which the various dimensions of EE relate to actual parenting behaviour. For example, McCarty et al. (2004) found support for the validity of criticism but not EOI when observing actual parent child interactions. Calam et al. (2002) reported that CFI criticism ratings were significantly correlated with independent clinician ratings of perceived parent maltreatment potential. The number of studies of EE in families with children which make these kinds of comparisons are extremely limited, and it was beyond the scope of the present study to investigate this aspect.

Our findings would appear to indicate that, at least in the sample we used, the use of the FMSS might lead to elevated levels of inclusion of families in the high EE category. This is potentially important given that the FMSS has been the approach that has been more widely adopted across a range of studies of parents and children, both in relation to physical and mental health difficulties. Further exploration of methodological aspects of the application of different approaches to classification of EE in families with children would be both valuable and timely.

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