

Maternal Affective Disorder and Children's Representation of Their Families

Adriane Arteche · Lynne Murray

Published online: 3 February 2011
© Springer Science+Business Media, LLC 2011

Abstract Children's perceptions of family relationship are related to their later emotional and social adjustment. This is of particular relevance in the context of family stressors such as maternal affective disorder. This study investigated the effects of maternal postnatal depression and anxiety on children's family representations. In our sample of postnatally depressed mothers we also explored marital conflict as mediator between maternal psychopathology and children's representations. Family drawings of 235 4–5 year-old children (93 control, 53 depressed and 89 anxious) were examined. When compared to controls, children of depressed, but not of anxious mothers, were more likely to draw themselves as less prominent than other family members and to represent a dysfunctional family, less likely to represent themselves with a happy face and showed a greater tendency of drawing bizarre pictures. Marital conflict mediated the association between maternal depression and dysfunctionality in drawings.

Keywords Draw-a-family · Anxiety · Depression · Children · Family representation

Introduction

Children's perceptions of family relationships are important, as they are related to later child adjustment (Cummings et al. 2008; Dunn et al. 2002, 2004; Woolgar and Murray 2010). In turn, understanding these perceptions may help elucidate the routes whereby family dynamics affect youth

emotional development. This is particularly relevant in the context of family stressors such as divorce, and parental affective disorder. While research has focused on the former (Sturge-Apple et al. 2008), little is known about how children exposed to parental affective disorder apprehend and represent their family relationships.

Parental affective disorders are well-recognized risk factors for offspring mental health problems (Cooper et al. 2006). Although genetic factors are likely to play some role transmission of risk, environmental factors, like parenting and family cohesion, are considered equally important (Sullivan et al. 2000). Children of depressed mothers are likely to be exposed to poor parenting (Murray et al. 1996a) and marital conflict (Downey and Coyne 1990; Goodman and Gotlib 1999). In the context of maternal anxiety, although evidence is accumulating, the mediational role of parenting is so far less well-researched (Creswell et al. 2010); and while negative events such as divorce are known to be associated with child anxiety (Phillips et al. 2005), no studies have examined the pathway from maternal anxiety to lack of family cohesion and child psychopathology. To date, children's perspectives on these familial adversity factors have been largely neglected, with most research relying on parents' and teachers' reports. This is mainly due to a lack of appropriate techniques for investigating children's, and especially, young children's, representations. Children's drawings, however, represent a non-verbal technique that could be of significant benefit.

Draw-a-Family

To date, the main instrument for exploring children's family representations has been the Draw a Family (DAF) task. However, while several studies have demonstrated its

A. Arteche (✉) · L. Murray
Winnicott Research Unit, University of Reading,
3 Earley Gate, Reading RG6 6AL, UK
e-mail: a.xavierarteche@reading.ac.uk

validity (Gullone et al. 2006; Madigan et al. 2003; Roe et al. 2006), less agreement has emerged on how to interpret the drawings, and different DAF scoring systems have been developed. The inclusion and omission of family members is common to most (Burns and Kaufman 1972; Payne 1996), and appears to be related to actual family constellation (Payne 1996; Roe et al. 2006). Interestingly, regardless of actual household composition, omission of family members from the picture is related to poorer child adjustment (Dunn et al. 2002).

In addition to inclusion/exclusion of family members, other indicators have been specifically designed to assess child psychopathology. These include specific drawing characteristics (e.g., black color; Burkitt et al. 2003, 2004), engagement of family members, humanness of figures (Reynolds 1978), as well as certain global dimensions. These latter include overall negativity (e.g., in figures' incompleteness, absence of family cohesion and reduced use of color/background elaboration), emotional isolation (e.g., in expressions of anger/distance between figures) and child 'pride' (e.g., in apparent sense of belonging/feeling happy in family group) (Kaplan and Main 1986; Fury et al. 1997). Notably, such overall picture measures appear rather better related to child and family psychopathology than isolated indicators (Tharinger and Stark 1990).

In the current study we examined whether maternal psychopathology was associated with children's family representations assessed via the DAF. Using data from two longitudinal cohorts, we compared 5-year-old offspring of depressed and anxious mothers with offspring of control mothers in terms of both specific and global characteristics. We were particularly interested in whether maternal affective disorder in general was related to a poorer representation of the family by offspring, as well as whether maternal depression and anxiety were associated with specific aspects of children's family representations. Because the DAF is a visuo-motor task likely to be affected by child IQ (Barrett and Eames 1996), we took account of this when analysing maternal group effects. Finally, within our sample of depressed mothers, where more detailed information was available on family functioning, we also examined the role of marital conflict in mediating any associations between maternal disorder and children's drawings.

Method

Participants

Two-hundred and thirty five 5-year-old children (107 boys, 128 girls) participated in the study. They were part of two longitudinal studies investigating intergenerational transmission of affective disorder: one concerned children of

postnatally depressed mothers (PND; Cambridge Depression Study; Murray et al. 1996a, b), and one child of mothers with postnatal anxiety (Social Phobia-SP and Generalized Anxiety Disorder-GAD) (Anxiety Study; Murray et al. 2007). Both were prospective, with assessments starting in infancy with a 5 year follow up. Over 60% of families were middle-upper class, where both biological parents were resident. Stepfathers were rarely resident (3.8% depressed group, 3.4% anxious group, none in the control group) (see Table 1).

Depression Study

A community sample of primiparous mothers was screened at 5–6 weeks postpartum using the Edinburgh Postnatal Depression Scale (EPDS; Cox et al. 1987), and depression confirmed using the Standardized Psychiatric Interview (SPI; Goldberg et al. 1970). Fifty eight depressed and 42 non-depressed mothers were recruited. Marital conflict was assessed at 18 months. At 5 years, 53 case and 41 control group children completed the DAF assessment, and maternal mood was assessed via the General Health Questionnaire (GHQ); index mothers showed higher depressive symptoms than controls (index $M = 2.23$ ($SD = 3.37$), control $M = 0.34$ ($SD = 0.81$), $p = .001$).

Anxiety Study

A community sample of mothers was screened at 20 weeks pregnancy for anxiety (social phobia and GAD) via the Social Interaction and Anxiety Scale—SIAS, the Social Phobia Scale—SPS, and the Penn State Worry Questionnaire—PSWQ (Mattick and Clarke 1998; Meyer et al. 1990), and diagnoses were confirmed using the Structured Clinical Interview for DSM-IV Axis I disorders (SCID-1; First et al. 1995). 152 anxious mothers (Social Phobia ($n = 67$), GAD ($n = 56$)), and 94 controls were recruited. At 5 years, 89 case children and 52 controls completed the DAF. Maternal anxiety symptoms were assessed and index mothers showed more anxious symptoms than controls on all questionnaires (PSWQ index $M = 51.77$ ($SD = 15.24$), control $M = 36.53$ ($SD = 10.77$), $p < .0001$; SPS index $M = 16.07$ ($SD = 13.36$), control $M = 7.52$ ($SD = 7.92$), $p < .0001$; SIAS index $M = 27.00$ ($SD = 15.93$), control $M = 14.33$ ($SD = 6.94$), $p < .0001$). Studies approved by the University and local Medical Ethics Committees, and participants gave written informed consent.

Procedure

For all participants the DAF was administered in the laboratory as part of a battery of assessments. Children were given a blank A3 sheet and a set of six crayons (red, blue,

Table 1 Demographic characteristics by group

	Control (depression study) <i>n</i> = 41	Control (anxiety study) <i>n</i> = 52	Control (total) <i>n</i> = 93	Depressed <i>n</i> = 53	Anxious <i>n</i> = 89	Statistics ^a
Mother age at birth (mean/SD)	28.46 (3.76)	32.31 (3.21)	30.61 (3.94)	27.88 (4.06)	31.37 (4.08)	$F(2, 231) = 12.91^{***}$
Birth order ^b (% primiparous)	100%	71.2%	83.9	100.0	71.6	$\chi^2(2) = 18.64^{***}$
Child sex (% boys)	53.7	50.0	51.6	45.3	39.3	$\chi^2(2) = 2.77$
SES ^c (% high)	65.9	76.9	72.0	64.2	79.8	$\chi^2(2) = 4.24$
<i>Household configuration^d</i>						
Resident mother (% yes)	100.0	100.0	100.0	100.0	98.9	$\chi^2(2) = 1.65$
Resident father (% yes)	97.6	98.1	97.8	90.6	93.3	$\chi^2(2) = 3.83$
Resident stepfather (% yes)	0.0	0.0	0.0	3.8	3.4	$\chi^2(2) = 2.25$

SES Social economic status

^a Statistics refer to a 3-group comparison: control total, depressed and anxious

^b Being primiparous was an inclusion criteria in the depression study

^c SES based on the fathers' occupation, except if information for the father was not available. On these occasions the mother data was used. For the depression study SES was based on the Registrar National (1980)—classification I, II and III non manual as high SES. For the anxiety study the Standard Occupation Classification (2000) was used and 1, 2 and 3 were defined as high SES

^d Information refers to household configuration at the time of assessment

*** $p < .001$

green, black, yellow and orange) and asked to 'draw your family'. No further instructions were given. The assessment had a set time of 5 min for the anxiety study; however children were allowed to add final touches to their drawings if they had not finished it in time. For the depression study there was no set time, but most completed the drawing in less than 5 min. Mothers were able to observe their child's drawing, but were not involved in the task. In each study, a researcher labeled the drawing's figures after its completion, as indicated by the child. Drawings were scored by the first author and a clinically trained research assistant, both blind to maternal group.

The depression study was approved by the Cambridge Medical Ethics Committee. The anxiety study was approved by the NHS Research Ethics Committee and the University of Reading Research Ethics Committee. All mothers gave written informed consent.

Measures

Draw-a-Family

DAF was analyzed using items adapted from the Reynolds (1978) and Fury et al. (1997) systems. Additional specific items suggested in the literature were also included (i.e., color and prominence of family members). Drawings were coded on overall dimensions and specific indicators.

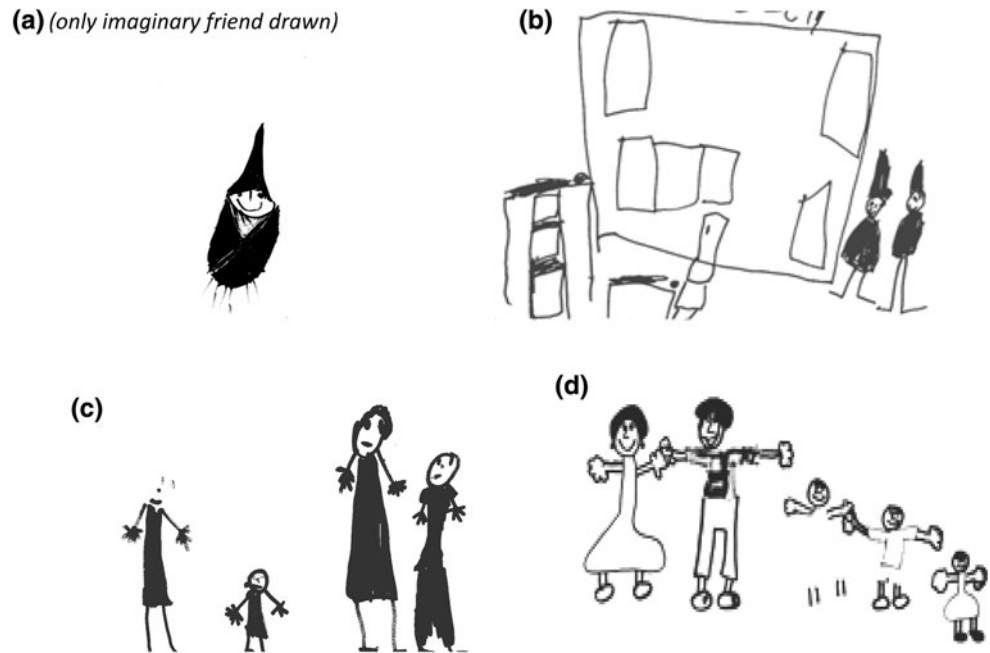
Overall dimensions

1. Overall adjustment (Fury et al. 1997). Measured whether the picture globally reflected a functional,

happy (e.g., signs of joy and contentment such as smile, joint activities, etc.), organized (e.g., there is some distinction among members, inclusion of key family members, etc.) and harmonious family (e.g., body language denotes closeness among members, without detachment of specific individuals (e.g., no omissions or segregation of individuals). Scores ranged from 0-definitely dysfunctional, to 4-definitely functional (see Fig. 1) and were based on the overall impression of the drawing. For this reason, presence of one of the above specific features alone was not a sufficient condition for attribution of higher scores.

- Physical proximity (Fury et al. 1997; Reynolds 1978). Assessed the closeness of family members. Scores ranged from 0- family members distant and inaccessible to each other, to 3- the majority proximal and in physical contact (i.e., touching hands, hugging, etc.; see Fig. 2a).
- Underlying structure (Reynolds 1978). Assessed presence of clear family structure, with adults drawn taller/bigger than children. Scores were 0 = no family structure, with at least one child being drawn bigger than at least one adult; scored as 1 = all family members the same size; and 2 = clear structure, with adults drawn taller/bigger than children.
- Bizarreness (Reynolds 1978). Assessed the whether family members could be identified as human: scored as 0 = bizarre and definitely not human (i.e., monster, dots, shadows), 1 = distorted, but still recognizably human, and 2 = clearly human (see Fig. 2b).

Fig. 1 Examples of overall adjustment. **a** Definitely dysfunctional; **b** Very likely to be dysfunctional; **c** Very likely to be functional; **d** Definitely functional



5. Color (Burkitt et al. 2004; Fury et al. 1997). This (1-yes/0-no) denotes predominant (>90%) use of black.

Specific indicators: all but the first measure focused on child and mother depictions.

1. Inclusion (Burns and Kaufman 1972; Payne 1996; 1-yes/0-no) of each of: (a) the child, (b) mother, (c) father, (d) anyone other than nuclear (including stepfather and half-sibling) family members.
2. Prominence (Burns and Kaufman 1972)—child/mother represented as notably more or less prominent than other figures (1-yes, 0-no). Higher prominence meant bigger, or more elaborated (e.g., facial expression/hair style/clothes/accessories), or more distinctive in color.
3. Emotional expression (Fury et al. 1997)—child/mother showing a happy facial expression (e.g., smile) or not (1-yes/0-no).
4. Dyadic alliance (Fury et al. 1997)—child drawn close to mother, and the pair placed separately/more distant from others (1-yes/0-no).
5. Isolation (Fury et al. 1997)—child drawn isolated from family. Isolation scored if physical barrier (e.g., walls, tree) separated child and rest of family; or if placed distant/on a different plane from others (1-yes/0-no).

Inter-rater reliability was computed on 18% of the drawings. Weighted Kappa coefficients for binary variables ranged from =0.84 (color) to =1.00 (inclusion and emotional expression). Pearson correlations for likert-type variables ranged from $r = .72$ (physical proximity) to $r = .84$ (overall adjustment).

Child IQ

In the Depression Study the McCarthy Scale of Children's Abilities (giving the General Cognitive Index (GCI); McCarthy 1972; see Murray et al. 1996b) was used. In the Anxiety Study, the Wechsler Preschool and Primary Scale of Intelligence (WPPSI; Wechsler 2002) was applied. Standardized total and performance IQ scores were used (for evidence of comparability between the McCarthy- GCI and the WISC- IQ see Naglieri 1980).

Marital Conflict

Marital conflict was assessed exclusively in the Depression Study at 18 months using the global marital conflict subscale of the Social Adjustment Scale (Weissman and Bothwell 1976); this provided a binary measure (presence/absence of conflict) derived from a continuous (1–6) rating.

Results

Data Analytic Strategy and Preliminary Analyses

All continuous variables met normality criteria. We initially examined whether the two control groups differed with regard to DAF measures. There was no evidence that control children from the two samples represented their families significantly differently, except for the presence of the father in the drawing. Although in both groups the great majority of children represented the father as present, the rate was somewhat greater for the anxiety vs. the



Fig. 2 **a** Examples of physical proximity. (i) Members are distant and inaccessible; (ii) Members are distant, somewhat accessible, but with no signs of interaction; (iii) Members are accessible, with no physical contact but signs of interactions; (iv) Most of the members are in

physical contact. **b** Examples of bizarreness. (i) bizarre and definitely do not represent humans, (ii) distorted, but still recognized as humans, and (iii) clearly represents humans. *Note.* Pictures depicted in *grayscale*, original colors not represented

depression control group (98.1% vs. 85.4%; $\chi^2(1) = 5.32$, $p = .027$). In view of this, control groups were combined, and compared to each of the index groups (i.e., depressed and anxious), except for analyses of father representations, where each index group was compared with its respective control group. Examination of inter-correlations among items revealed a number of weak to moderate significant associations. As expected, overall adjustment correlated with a number of specific indicators, the strongest associations being with bizarreness ($r = -.41$, $p < .001$), mother

happy face ($r_{pb} = .40$, $p < .001$) and child happy face ($r_{pb} = .37$, $p < .001$; see Table 4; coefficients represent *phi*, Pearson or point biserial (pb) associations, as appropriate).

Next we examined the relationship between child IQ and DAF measures. Whenever a significant association was observed, group effects were investigated controlling for child IQ. In all cases, results remained unaltered, therefore only main IQ and main group effects are reported.

Child IQ and DAF

Firstly, analyses on child IQ and the DAF indicators were performed on total IQ scores. Due to the nature of the DAF task, in a secondary step we also examined the association between performance IQ and the DAF indicators.

Analysis of variance revealed no significant group differences in total IQ scores and there was no evidence of main sex effects or of an interaction between group status and sex (all p 's > .12).

Significant Pearson correlations were observed between child total IQ and four overall DAF measures. Higher IQ was associated with better overall ratings of family functionality ($r = .22$, $p < .0001$), more physical proximity ($r = .17$, $p = .007$), better underlying family structure ($r = .14$, $p = .03$) and less bizarre content ($r = -.13$, $p = .04$). Point-biserial correlations revealed no significant associations between child total IQ and specific indicators, except that higher IQ was related to less representation of self as more prominent than others ($r_{pb} = -.20$, $p = .02$), and greater likelihood of the mother being drawn with a happy face ($r_{pb} = .14$, $p = .03$).

Correlations between DAF indicators and performance IQ were also examined and similar results were observed. Thus, significant associations were observed between performance IQ and overall adjustment ($r = .28$, $p < .0001$), physical proximity ($r = .15$, $p = .02$), underlying family structure ($r = .13$, $p = .05$), bizarreness ($r = -.15$, $p = .02$), self less prominent ($r_{pb} = -.17$, $p = .02$) and mother happy face ($r_{pb} = .21$, $p = .002$). No other significant associations were found and group effects did not change once performance IQ was entered as a covariate. The association between total IQ and performance IQ was $r = .78$, $p < .0001$.

Family Structure and DAF

Analysis of variance and chi-square tests were used to examine effects of (a) absence of a resident father; and (b) presence of a resident stepfather for continuous and binary variables, respectively. Absence of a father at home was marginally related to lower overall family adjustment ($F(1, 224) = 2.88$, $p = .091$, $\eta^2 = .013$), and significantly associated with omission of the father ($\chi^2(1) = 13.73$, $p = .004$, Cramer's $V = .24$) and inclusion of non-family members ($\chi^2(1) = 19.46$, $p < .001$, Cramer's $V = .30$). Presence of a resident stepfather was not significantly related to any overall DAF measure, but it was associated with drawing the mother as more prominent ($\chi^2(1) = 6.52$, $p = .05$, Cramer's $V = .77$). Given the absence of group differences in actual household composition and the low numbers for absent fathers and presence of stepfathers at home, interactions with group were not performed.

Sex, Group and Group by Sex Effects

Girls had higher scores on overall adjustment ($F(1, 233) = 23.78$, $p < .0001$, $\eta^2 = .100$) and lower scores on bizarreness ($F(1, 233) = 14.19$, $p < .0001$, $\eta^2 = .060$) than boys. In addition, boys were less likely to include the mother in the picture ($\chi^2(1) = 3.44$, $p = .061$, Cramer's $V = .12$), more likely to include non-family members ($\chi^2(1) = 6.61$, $p = .008$, Cramer's $V = .17$) and less likely to represent the mother with a happy face ($\chi^2(1) = 9.26$, $p = .002$, Cramer's $V = .20$).

Significant ($p < .05$) or marginally significant ($p < .10$) maternal group effects were observed for five variables. In comparison to children of control and of anxious mothers, children of PND mothers were more likely to draw themselves as less prominent than other family members ($\chi^2(2) = 6.49$, $p = .039$, Cramer's $V = .19$), less likely to represent themselves as happy ($\chi^2(2) = 5.14$, $p = .077$, Cramer's $V = .15$), showed a greater tendency to draw bizarre pictures ($F(2, 232) = 3.03$, $p = .050$, $\eta^2 = .027$; pairwise comparison control vs. PND $p = .060$, control vs. anxious $p = ns$, PND vs. anxious $p = .016$), and were more likely to represent a dysfunctional family ($F(2, 232) = 4.12$, $p = .017$, $\eta^2 = .034$; pairwise comparison control vs. PND $p = .011$, control vs. anxious $p = ns$, PND vs. anxious $p = .010$). Interactions with sex were observed for a number of variables. Girls of depressed mothers were more likely to include non-nuclear family members in their pictures ($\chi^2(1) = 6.56$, $p = .038$, Cramer's $V = .24$), when compared to daughters of control mothers; whilst boys of PND mothers tended to draw more pictures in only black ($\chi^2(2) = 4.93$, $p = .085$, Cramer's $V = .21$), and to show poorer overall signs of family functionality ($F(2, 221) = 2.46$, $p = .088$, $\eta^2 = .022$), less physical proximity between members ($F(2, 221) = 2.39$, $p = .094$, $\eta^2 = .022$) and higher levels of bizarreness ($F(2, 221) = 2.77$, $p = .065$, $\eta^2 = .024$) than boys of control and anxious mothers. Finally, girls of anxious mothers showed a greater likelihood of not including themselves in the picture ($\chi^2(2) = 7.13$, $p = .028$, Cramer's $V = .24$) when compared to girls of control and PND mothers, whilst boys of anxious mothers, surprisingly, tended to be more likely to represent a clear family structure when compared to boys of controls and PND mothers ($F(2, 221) = 2.60$, $p = .077$, $\eta^2 = .022$) (see Tables 2 and 3).

With regard to father representations—where control groups were kept separate and compared to their respective index sample—there were no significant differences ($\chi^2(1) = 0.22$, ns) between children of PND mothers (88.7% drew their fathers) and children of control mothers (85.4% included the father in the picture). Conversely, children of anxious mothers were somewhat less likely to include the father in their family drawing than control

Table 2 Descriptive statistics for overall items by group and by sex

	Control			Depressed			Anxious		
	Total (<i>n</i> = 93)	Boys (<i>n</i> = 48)	Girls (<i>n</i> = 45)	Total (<i>n</i> = 53)	Boys (<i>n</i> = 24)	Girls (<i>n</i> = 29)	Total (<i>n</i> = 89)	Boys (<i>n</i> = 35)	Girls (<i>n</i> = 54)
Overall adjustment (mean/SD)	2.22 (1.06)	1.89 (0.94)	2.58 (1.10)	1.75 (1.14)	1.17 (0.94)	2.26 (1.03)	2.24 (1.01)	2.16 (0.77)	2.48 (1.01)
Physical proximity (mean/SD)	1.22 (1.07)	1.23 (1.14)	1.20 (1.01)	0.98 (1.02)	0.56 (0.84)	1.31 (1.04)	1.21 (1.01)	1.12 (0.91)	1.32 (1.06)
Underlying family structure (mean/ SD)	1.01 (0.86)	0.89 (0.86)	1.13 (0.84)	1.09 (0.81)	1.13 (0.81)	1.10 (0.82)	1.18 (0.84)	1.40 (0.80)	1.06 (0.84)
Bizarreness (mean/ SD)	0.13 (0.40)	0.17 (0.43)	0.09 (0.36)	0.26 (0.56)	0.48 (0.06)	0.06 (0.37)	0.09 (0.32)	0.18 (0.47)	0.00 (0.00)
Color (% mostly black)	8.6	10.4	6.7	15.1	29.2	3.4	14.6	11.4	16.7

Table 3 Descriptive statistics for specific items by group and by sex

	%								
	Control			Depressed			Anxious		
	Total (<i>n</i> = 93)	Boys (<i>n</i> = 48)	Girls (<i>n</i> = 45)	Total (<i>n</i> = 53)	Boys (<i>n</i> = 24)	Girls (<i>n</i> = 29)	Total (<i>n</i> = 89)	Boys (<i>n</i> = 35)	Girls (<i>n</i> = 54)
Inclusion—self (% yes)	97.8	95.8	100.0	92.5	83.3	100.0	92.1	94.3	90.7
Inclusion—mother (% yes)	95.7	93.8	97.8	90.6	87.5	93.1	97.8	94.3	100.0
Inclusion—non nuclear family member (% yes)	12.4	22.2	2.3	24.5	29.2	20.7	14.5	19.4	11.1
High prominence—mother (% yes)	24.5	29.2	20.7	25.7	21.4	28.6	22.2	27.8	19.4
Low prominence—mother (% yes)	6.4	7.3	5.4	4.9	5.0	4.8	9.0	9.1	8.9
High prominence—self (% yes)	28.6	34.6	23.3	21.2	21.4	21.1	20.8	23.5	19.4
Low prominence—self (% yes)	2.7	2.6	2.8	15.2	9.5	20.0	7.6	13.0	4.7
Emotional expression—happiness mother (% yes)	53.9	48.9	59.1	50.0	47.6	51.9	57.5	51.5	61.1
Emotional expression—happiness self (% yes)	51.6	43.5	60.0	44.0	28.6	55.2	63.4	51.5	71.4
Isolation—self (% yes)	22.0	23.9	20.0	31.4	31.8	31.0	18.3	18.2	18.4
Dyadic alliance (% yes)	30.0	0.0	50.0	50.0	20.0	71.4	28.6	20.0	33.3

participants ($\chi^2(2) = 3.34, p = .062$, Cramer's $V = .15$; control 98.1% drew the father vs. anxious 89.9%).

Marital Conflict

As previously reported (Murray et al. 1996a, b), PND was a significant predictor of marital conflict at 18 months ($F(1, 89) = 35.60, p < .0001, \eta^2 = .29$). Absence of a resident father was similarly significantly related to marital conflict ($\phi = -.20, p = .05$), although presence of a resident stepfather was not. With regard to our overall assessment of the drawings, marital conflict was significantly associated with less overall family functionality ($r = -.28, p = .007$) and higher bizarreness scores ($r = .21, p = .04$). There were no significant associations between

marital conflict and either physical proximity ($r = -.11, ns$) or underlying family structure ($r = -.13, ns$). When the relationship between marital conflict and specific indicators was examined, conflict was significantly associated with inclusion of figures other than those in the nuclear family ($\phi = .29, p = .006$).

Finally, a series of regression analyses was performed to examine marital conflict as a mediator between postnatal maternal depression and DAF indicators. Two variables (overall family functionality and bizarreness) met criteria for mediation testing (i.e., both group and marital conflict had significant effects on the DAF measure. The third criteria for mediation, group effect on the mediator, had already been demonstrated by our significant group effects on marital conflict). Linear regression analysis showed

that, in both cases, once marital conflict was taken into account, maternal depression status no longer significantly predicted child outcome in the family representations, whereas marital conflict remained significant. Thus, marital conflict was confirmed as a mediator between PND and overall family functionality (PND $B = 0.02$, $t = 0.17$, ns; marital conflict $B = -0.23$, $t = 2.09$, $p = .04$) and bizarreness (PND $B = 0.04$, $t = 0.37$, ns; marital conflict $B = 0.21$, $t = 1.93$, $p = .05$).

Discussion

This study investigated the association between maternal affective disorder and children's family representations using the DAF task. Results suggested that at 5 years children of postnatally depressed, but not of postnatally anxious, mothers, showed a significantly different representation of their family when compared to children of control mothers. Specifically, regardless of cognitive ability, children of PND mothers depicted lower overall family adjustment in their drawings and showed higher levels of bizarreness than children of control and of anxious mothers. This is consistent with our previous reports of poorer maternal interactions with the child in the depressed (e.g., Murray et al. 1996a), but not the anxious group (Murray et al. 2007), and is particularly important as children's poor representations of their families are often associated with later adjustment problems (Dunn et al. 2004; Dunn et al. 2002; Woolgar and Murray 2010). The fact that even at such an early age children of postnatally depressed mothers represent their families in a more dysfunctional way suggests that this might be one route whereby offspring of PND mothers develop social difficulties (Murray et al. 1996a, b).

Mediation analyses showed that marital conflict fully explained the associations between PND and overall measures of family adjustment and bizarreness. This is in line with previous studies that have shown overall indicators of the Draw-a-Family task to be better predictors of family adjustment than specific items (Fury et al. 1997; Tharinger and Stark 1990); and it also indicates that friction between the parents does lead to a more negative child perception of the family. Hence, in order to prevent adverse effects of PND on offspring development, future interventions should consider targeting not only maternal symptoms, and the mother–child dyad, but also marital and family relationships.

It is likely that some of the specific items assessed were embedded in those features of the drawings that lead to a low score on overall adjustment—as is indicated by the associations between overall adjustment and specific DAF

indicators. Nevertheless, while group effects were not observed on all specific indicators, they were more evident in children's self-representation items. Thus, children of PND mothers were more likely to represent themselves as less prominent, and were less likely to draw themselves with a happy face. Although consideration of children's psychopathology was beyond the scope of this paper, group effects on these specific items suggest not only that children of PND mothers represent their families more negatively, but also that their self-perceptions seem to differ from control children. More importantly, their negative self-representations suggest signs of sadness and, potentially, lower self-esteem, as indicated by the item reflecting personal value—both of which could be precursors of later emotional disorders, commonly observed in offspring of PND mothers (Lieb et al. 2002).

A number of significant interactions with sex suggested that sons of postnatally depressed mothers may be particularly affected by their mothers' disorder. In particular, when compared to controls, boys of PND mothers seem to show poorer representations on items reflecting the perception of the family as a whole, such as color (see Burkitt et al. 2003, 2004 on use of black color and negative child mood), overall adjustment, less physical proximity (see Kaplan and Main 1986 for evidence of global pathology and less physical proximity as indicators of poor family adjustment in children's family drawings) and bizarreness (see Reynolds 1978 for evidence of low humanness of the figure indicating poor family adjustment). Previous research has shown that sons of PND mothers experience greater impairments in mother–child interactions than daughters (Murray et al. 1993; Weinberg et al. 2006). Thus, it could be that negative family representations are just the next step of this early impaired relationship. Interestingly, although no significant differences were observed between children of postnatally anxious mothers and controls either in global measures or in specific indicators, two interactions with sex emerged. Girls of anxious mothers were more likely to exclude themselves from the picture, and boys of anxious mothers were more likely to represent a clear family structure. Although we can hypothesize that the girls' effect might possibly reflect difficulties related to maternal disorder, the boys' result is intriguing, and further studies are needed to provide a better understanding of this finding.

In addition to shedding light on maternal affective disorder and children's family representations, this study supported the validity of the DAF. While the associations between IQ and the DAF support the idea that drawings are, to some extent, a measure of visuo-motor ability, in all cases group effects remained the same when IQ was controlled for. Moreover, we confirmed the hypothesis that inclusion of family members is related to current household

composition (Roe et al. 2006), and that absence of a resident father and inclusion of non-family members is related to poorer DAF overall adjustment. Taking into account that the latter was also associated with higher levels of marital conflict, it is possible that the correlation between low family adjustment and absence of a resident father is linked to marital conflict issues.

Despite the study strengths, some limitations applied. Firstly, we did not assess marital conflict in our sample of anxious mothers. Thus, we are not able to discuss whether the absence of differences between children of control and of anxious mothers is because maternal anxiety does not lead to increased marital conflict, thereby sparing wider family relationships. Alternatively, it could be that despite any increased marital conflict, there are protective factors that prevent children of anxious mothers from perceiving their families as more dysfunctional. Also, the procedure regarding timing of the task differed slightly between studies; nevertheless, the absence of significant differences in the DAF between the two original control groups

reassures us that this did not influence our results. Thirdly, although child IQ did not alter the group effects we observed, the majority of the sample was within a normal IQ range, and further studies need to be conducted to confirm that the results would hold for children with below average cognitive ability. In addition, our sample was relatively young (i.e., 5 years old) and more studies are needed to replicate our findings with older children with more developed drawing skills. Finally, further research is needed to investigate links between children's representations and later measures of adjustment.

Acknowledgments The research was supported by the MRC, the Tedworth Charitable Trust and the Health Foundation. We thank Alison Hipwell and Liz Schofield for help in the assessments, and Bruno Proenca for assistance on reliabilities.

Appendix

See Table 4.

Table 4 Inter-correlations among all DAF indicators

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Overall adjustment	-.28**	.28**	-.41**	-.08	.29**	.32**	-.32**	-.006	-.22**	-.17*	-.15*	.40**	.37**	-.21**	.02
2. Physical proximity	–	.01	-.10	-.06	.04	.14*	-.02	-.04	-.05	-.05	-.12 ⁺	.18*	.27**	-.22**	-.02
3. Underlying family structure		–	-.14*	.10	.05	.10	-.08	.20*	-.23**	-.49**	.17*	.09	-.005	.03	.09
4. Bizarreness			–	-.10	-.05	-.31**	.06	-.09	.02	.03	.14*	-.20**	-.22**	.12 ⁺	-.04
5. Color				–	-.08	.08	.02	.08	-.10	.04	.02	-.07	-.03	-.005	-.03
6. Inclusion—self					–	.21**	-.15*	.07	-.01	nc	nc	.02	nc	nc	nc
7. Inclusion—mother						–	-.08	nc	nc	.05	-.04	nc	.06	-.18**	nc
8. Inclusion—non nuclear family member							–	-.04	.02	.03	.06	-.06	.02	.12	.11 ⁺
9. High prominence—mother								–	-.13	.00	-.002	-.14	-.10	-.07	-.04
10. Low prominence—mother									–	.18 ⁺	.00	-.15*	.00	.10	-.07
11. High Prominence - self										–	-.14	-.12	-.009	-.08	-.15 ⁺
12. Low prominence—self											–	-.23**	-.27***	-.02	-.07
13. Emotional expression—happiness mother												–	.45***	-.05	.03

Table 4 continued

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
14. Emotional expression—happiness self													–	–.06	.07
15. Isolation—self														–	.41***
16. Dyadic alliance															–

nc not computed because inclusion of the self and/or the mother is a condition for examination of its respective features (e.g., prominence, emotional expression, etc.)

⁺ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$. Coefficients represent Pearson, point biserial or phi correlations as appropriate. Relationships with inclusion of the dad were examined separately for our two original study samples. Within children of the depression study inclusion of the dad was significantly related to overall adjustment ($r = .29^{**}$), inclusion of the self ($r = .23^*$), inclusion of the mother ($r = .38^{**}$), inclusion of non family members ($r = -.28^{**}$) and isolation of the self ($r = -.28^{**}$). Within children of the anxiety study inclusion of the dad was significantly associated with overall adjustment ($r = .25^{**}$), inclusion of the self ($r = .15^+$) and inclusion of the mum ($r = .45^{**}$)

References

- Barrett, M., & Eames, K. (1996). Sequential developments in children's human figure drawing. *British Journal of Developmental Psychology*, *14*, 219–236.
- Burkitt, E., Barrett, M., & Davies, A. (2003). Children's colour choices for completing drawings of affectively characterised topics. *Journal of Child Psychology and Psychiatry*, *44*, 445–455.
- Burkitt, E., Barrett, M., & Davies, A. (2004). The effect of affective characterizations on the use of size and colour in drawings produced by children in the absence of a model. *Educational Psychology*, *24*, 315–329.
- Burns, R., & Kaufman, H. (1972). *Actions, styles and symbols in kinetic family drawings: An interpretative manual*. New York, NY: Brunner-Rotledge.
- Cooper, P., Fearn, V., Willetts, L., Seabrook, H., & Parkinson, M. (2006). Affective disorder in the parents of a clinic sample of children with anxiety disorders. *Journal of Affective Disorders*, *93*, 205–212.
- Cox, J. L., Holden, J. M., & Sagovsky, R. (1987). Detection of postnatal depression: Development of the Edinburgh postnatal depression scale. *British Journal of Psychiatry*, *150*, 782–786.
- Creswell, C., Murray, L., Stacey, J., & Cooper, P. (2010). Parenting and child anxiety. In W. Silverman & A. Field (Eds.), *Anxiety disorders in children and adolescents: Research, assessment and intervention* (2nd ed.). Cambridge: Cambridge University Press.
- Cummings, E., Schermerhorn, A., & Keller, P. (2008). Parental depressive symptoms, children's representations of family relationships, and child adjustment. *Social Development*, *17*, 278–305.
- Downey, G., & Coyne, J. (1990). Children of depressed parents: An integrative review. *Psychological Bulletin*, *108*, 50–76.
- Dunn, J., Cheng, H., O'Connor, T., & Bridges, L. (2004). Children's perspectives on their relationships with their nonresident fathers: Influences, outcomes and implications. *Journal of Child Psychology and Psychiatry*, *45*, 553–566.
- Dunn, J., O'Connor, T., & Levy, I. (2002). Out of the picture: A study of family drawings by children from step-, single-parent, and non-step families. *Journal of Clinical Child and Adolescent Psychology*, *31*, 505–512.
- First, M. B., Spitzer, R. L., Gibbon, M., et al. (1995). *Structured clinical interview for DSM-IV Axis I diagnoses*. New York: New York State Psychiatric Institute, Biometrics Research Department.
- Fury, G., Carlson, E., & Sroufe, A. (1997). Children's representations of attachment relationships in family drawings. *Child Development*, *6*, 1154–1164.
- Goldberg, D. P., Cooper, B., Estwood, M. R., Kedward, H. B., & Shepherd, M. (1970). A standardized psychiatric interview for use in community surveys. *British Journal of Preventive Social Medicine*, *24*, 18–23.
- Goodman, S. H., & Gotlib, I. H. (1999). Risk of psychopathology in the children of depressed mothers: A developmental model for understanding mechanisms of transmission. *Psychological Review*, *106*, 458–489.
- Gullone, E., Ollendick, T., & King, N. (2006). The role of attachment representation in the relationship between depressive symptomatology and social withdrawal in middle childhood. *Journal of Child and Family Studies*, *15*, 271–285.
- Kaplan, N., & Main, M. (1986). *Instructions for the classification of children's family drawings in terms of representation of attachment*. Unpublished manuscript, University of California, Berkeley.
- Lieb, R., Isensee, B., Höfler, M., Pfister, H., & Wittchen, H. (2002). Parental major depression and the risk of depression and other mental disorders in offspring. *Archives of General Psychiatry*, *59*, 365–374.
- Madigan, S., Ladd, M., & Goldberg, S. (2003). A picture is worth a thousand words: Children's representations of family as indicators of early attachment. *Attachment and Human Development*, *5*, 19–37.
- Mattick, R. P., & Clarke, J. C. (1998). Development and validation of measures of social phobia scrutiny fear and social interaction anxiety. *Behaviour Research and Therapy*, *36*, 455–470.
- McCarthy, D. (1972). *McCarthy scales of children's abilities*. New York: Psychological Corporation.
- Meyer, T. J., Miller, M. L., Metzger, R. L., & Borkovec, T. D. (1990). Development and validation of the Penn State Worry Questionnaire. *Behaviour Research and Therapy*, *28*, 487–495.
- Murray, L., Cooper, P., Creswell, C., Schofield, E., & Sack, C. (2007). The effects of maternal social phobia on mother-infant interactions and infant social responsiveness. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *48*, 45–52.
- Murray, L., Fiori-Cowley, A., Hooper, R., & Cooper, P. (1996a). The impact of postnatal depression and associated adversity on early mother-infant interactions and later infant outcome. *Child Development*, *67*, 2512–2525.
- Murray, L., Hipwell, A., Hooper, R., Stein, A., & Cooper, P. (1996b). The cognitive development of 5-year-old children of postnatally

- depressed mothers. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 37, 927–935.
- Murray, L., Kempton, C., Woolgar, M., & Hooper, R. (1993). Depressed mothers' speech to their infants and its relation to infant gender and cognitive development. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 51, 621–629.
- Murray, L., Sinclair, D., Cooper, P., Ducournau, P., & Turner, P. (1999a). The socioemotional development of 5-year-old children of postnatally depressed mothers. *Journal of Child Psychology and Psychiatry*, 40, 1259–1271.
- Murray, L., Woolgar, M., Briers, S., & Hipwell, A. (1999b). Children's social representation in doll's house play and theory of mind tasks, and their relation to family adversity and child disturbance. *Social Development*, 8, 179–220.
- Naglieri, J. (1980). Comparison of McCarthy general cognitive index and WISC-R IQ for educable mentally retarded, learning disabled and normal children. *Psychological Reports*, 47, 591–596.
- Office for National Statistics. (2000). *Standard occupation classifications*. London: Stationary Office.
- Payne, M. (1996). Some effects of sex, age, and household structure on family drawings of Barbadian children. *The Journal of Social Psychology*, 136, 567–578.
- Phillips, N. K., Hammen, C. L., Brennan, P. A., Najman, J. M., & Bor, W. (2005). Early adversity and the prospective prediction of depressive and anxiety disorders in adolescents. *Journal of Abnormal Child Psychology*, 33, 13–24.
- Registrar General. (1980). *Classification of occupation*. London: HMSO.
- Reynolds, C. R. (1978). A quick scoring guide to the interpretation of children's Kinetic Family Drawings (KFD). *Psychology in the School*, 15, 489–492.
- Roe, A., Bridges, L., Dunn, J., & O'Connor, T. (2006). Young children's representation of their families: A longitudinal follow-up study of family drawings by children living in different family settings. *International Journal of Behavioral Development*, 30, 529–536.
- Sturge-Apple, M., Davies, P., Winter, M., Cummings, E. M., & Schermerhorn, A. (2008). Interparental conflict and children's school adjustment: The explanatory role of children's internal representations of interparental and parent-child relationships. *Developmental Psychology*, 44, 1678–1690.
- Sullivan, P., Neale, M., & Kendler, K. (2000). Genetic epidemiology of major depression: Review and meta-analysis. *American Journal of Psychiatry*, 157, 1552–1562.
- Tharinger, D., & Stark, K. (1990). A qualitative versus quantitative approach to evaluating the draw-a-person and kinetic family drawing: A study of mood and anxiety-disorder children. *Psychological Assessment*, 2, 365–375.
- Wechsler, D. (2002). *The wechsler preschool and primary scale of intelligence* (Third Edition (WPPSI-III) ed.). San Antonio, TX: The Psychological Corporation.
- Weinberg, M. K., Olson, K. L., Beeghly, M., & Tronick, E. Z. (2006). Making up is hard to do, especially for mothers with high levels of depressive symptoms and their infant sons. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 47, 670–683.
- Weissman, M. M., & Bothwell, S. (1976). Assessment of social adjustment by patient self-report. *Archives of General Psychiatry*, 33, 1111–1115.
- Woolgar, M., & Murray, L. (2010). The representation of fathers by children of depressed mothers: Refining the meaning of parentification in high risk samples. *Journal of Child Psychology and Psychiatry*, 51, 621–629.