

**Table 1: Summary of studies of mothers with BPD/offspring of mothers with BPD**

First author (year)	Country	Offspring sample & age	Mother sample & control group	BPD assessment (cut-point)	Sample frame	Design	Methodology	Main aims
Abela (2005)	Canada	120 children of parent with MDD 20 of parent with MDD/BPD 6-14 years	87 parents MDD 15 parents MDD/BPD (84% mothers)	SCID-II ( $\geq 5$ )	Community (High risk)	Case-control	Questionnaire Interview	To assess whether children of parents with comorbid MDD/BPD at greater risk for depressive symptoms and if increased risk due to higher levels of cognitive and/or interpersonal vulnerability
Barnow (2006)	Germany	23 of mothers with BPD 47 of mothers with depression 31 of mothers with cluster C PD 156 of healthy mothers 11-18 years	16 mothers with BPD 36 mothers-depression 28 mothers-cluster C PD 116 healthy mothers	SCID-II ( $\geq 4$ )	Community (from longitudinal cohort)	Case-control	Questionnaire Interview	Examined the psychopathology, individual characteristics and family environment and experiences of children of mothers with BPD
Barnow (2013)	Germany	323 offspring T <sub>0</sub> 15 years T <sub>1</sub> 20 years	247 mothers	SCID-II (Self rated) DSM III & IV	Community (from longitudinal cohort)	Cohort (2 time points)	Questionnaire Interview	Investigated familial transmission of mother's borderline symptoms whilst controlling for depression
Bertino (2012)	Australia	30 children 4-8 years 29 adolescent 12-18 years	59 parents (80% mothers)	MCMI III	Clinical Sub-clinical	Cross-sectional	Questionnaire Interview	Investigation of the relationship between parent personality patterns and offspring internalising/externalising behaviour
Blankley (2015)	Australia	42 Newborn infants of mothers with BPD 14313 of healthy mothers	42 mothers with BPD 14313 healthy mothers	DSM-IV-R psychiatric assessment	Clinical and community	Case-control	Retrospective case file review	To examine pregnancy and early infant outcomes of mothers with BPD
Cheng (2010)	China	7675 total high school students 30 BPD; 2605 control 18+ years	7675 student-parent pairs 35 BPD; 2737 control	PDQ-4 ( $>40$ index; $<20$ control) IPDE	Community	Case-control	Questionnaire Interview	To assess familial transmission of PDs (with specific BPD measures)
Conway (2015)	USA	T <sub>1</sub> 815 offspring age 15 T <sub>2</sub> 700 offspring age 20	700 mothers	SCID II ( $\geq 5$ )	Community (High risk)	Cohort (2 time points)	Questionnaire Interview	To investigate precursors of adult borderline personality pathology in a high-risk sample, including maternal psychopathology
Crandell (2003)	UK	Infants 2 months	8 mothers with BPD 12 mothers no psychiatric disorder	SCID-NP SCID II ( $\geq 5$ )	Community	Case-control	Still-face paradigm	To investigate mother-infant relations/interactions where mothers have BPD
Crittenden (2010)	Australia	32 Infants 3-36 months	15 mothers with BPD 17 mothers no psychiatric disorder	DIB ( $>8$ )	Clinical	Case-control	Questionnaire Interview	Compared mothers functioning: experience, dispositional representations and self-protection strategies to mothers with no psychiatric disorder
Delavenne (2008)	France	34 infants 3 months	17 mothers with BPD 17 mothers no psychiatric disorder	SIDP-IV	Clinical	Case-control	Acoustic micro-analysis of verbal interactions	Compared the phrasal organisation of mother-infant vocal interactions of mothers with BPD with mothers with no psychiatric disorder
Elliot (2014)	Australia	Infants 3-14 months	13 mothers with BPD 13 healthy mothers	ZAN-BPD ( $\geq 8$ )	Clinical	Case-control	Interview Questionnaire Infant face-stimuli emotion recognition task	To investigate mothers with BPD ability to assess own infant and unknown infant happy, sad and neutral emotions. Response compared with healthy control mothers.
Feldman (1995)	Canada	21 children of mothers with BPD 4+ years (mean 12 years) 23 of mothers with other PDs	9 mothers with BPD 14 mothers other PDs	DIB-R (current cut point of 6 or past score)	Clinical (part of larger BPD study)	Case-control	Questionnaire Interview	To assess family stability, satisfaction and environment of families of mothers with BPD with families of mothers with other PDs

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		4+ years (mean 9.6 years)		of 8 out of 10)				
Frankel-Waldheter (2015)	USA	28 adolescents of mothers with BPD 28 comparison adolescents (mean 15 years 5 months)	28 mothers with BPD 28 comparison mothers	SCID-II ( $\geq 5$ ) PAI-BOR	Clinical and community	Case-control	Questionnaires Filmed mother-adolescent interactions	To examine BPD, autonomy and relatedness, and internalizing and externalizing symptoms in mothers with BPD and their adolescent offspring
Gratz (2014)	USA	23 infants of mothers with BPD (mean 17.4 months) 78 infants of mothers without BPD (mean 16.2 months) 12-23 months	23 mothers with BPD 78 mothers without BPD (94 with complete data)	BEST (>30)	Community	Case-control	Questionnaire Interview Lab-TAB assessment Strange situation	To examine the relationship between maternal emotion dysregulation (associated with borderline pathology) and infant emotion regulation difficulties
Harvey (2011)	USA	184 Pre-school children with behavioural problems 3-4 years	182 mothers of children with behavioural problems (126 fathers) BPD assessed	MCMI-III ( $\geq 75$ )	High risk (from longitudinal cohort)	Cross-sectional (first time-point of longitudinal study)	Questionnaire Mother-child interaction tasks	To assess associations between parental psychopathology, parenting practices and child externalising behaviours
Herr (2008)	Australia	110 youths with current or past diagnosis MDD or DD 15 years	189 mothers with MDD 83 mothers with DD 82 mothers with MDD & DD 461 never depressed mothers	SCID-Q (0-8 scale cut point 5)	Community High risk (from birth cohort)	Case-control	Questionnaire Interview	To investigate associations between maternal BPD and offspring interpersonal functioning, attachment cognitions and depression and whether any association is independent of maternal or offspring depressive symptoms.
Hobson (2005)	UK	32 infants: 10 of mothers with BPD 22 of mothers with no psychiatric disorder (12 months: 47-57 weeks)	10 mothers with BPD 22 mothers no psychiatric disorder	SCID-NP SCID-II ( $\geq 5$ )	Community	Case-control	Set situation Strange situation Mother-infant play	To assess personal relatedness and attachment in year old infants and mother-infant interactions where mothers have BPD
Hobson (2009)	UK	59 infants (12-18 months): 13 of mothers with BPD 15 of mothers with depression 31 of mothers with no psychiatric disorder	13 mothers with BPD 15 mothers with depression 31 mothers no psychiatric disorder	SCID-NP SCID-II ( $\geq 5$ )	Community (from previously diagnosed cohort and longitudinal study)	Case-control	Strange Situation	To investigate how mothers with BPD relate to their infants in separation-reunion situations
Howard (1995)	USA	51 infants of cocaine abusing mothers 6 months	51 cocaine abusing mothers (child in their care) Borderline cycloid * assessed	MCMI	High Risk Community	Cross-sectional	Questionnaire Interview Home observations	To investigate the effect of maternal personality disorder on the development of infants of cocaine abusing mothers
Jellinek (1991)	USA	100 children of parents with affective disorders 351 children of parents with no disorder Interview: 19 children above PCS cutoff (6 of mothers with BPD) 18 children below PCS cutoff 6-12 years	74 families with affective disorders (78% mothers)	DSM-III-R diagnosis	High Risk	Cross-sectional	Questionnaire Interview	To determine whether parent psychopathology is associated with scores indicative with dysfunction on the Pediatric Symptom Checklist
Kiel (2011)	USA	22 infants of mothers with BPD 77 infants of mothers with	22 mothers with BPD 77 mothers with	BEST (>30)	Community	Case-control	Questionnaire Strange situation	To compare maternal affective and behavioural response to infant distress in mothers with

First author (year)	Country	Offspring sample & age	Mother sample & control group	BPD assessment (cut-point)	Sample frame	Design	Methodology	Main aims
		minimal/no BPD pathology 12-23 months	minimal/no BPD pathology					clinically relevant levels of BP pathology to mothers with minimal BP pathology
Macfie (2009)	USA	30 children of mothers with BPD 30 of mothers without BPD 4-7 years	Mothers with BPD Mothers without BPD	SCID-II ( $\geq 5$ ) PAI (continuous)	High Risk Clinical & Community	Case-control	Interview Story-stem completion task	To assess emotion regulation, representations of self and representations of the mother-infant relationship in children of mothers with BPD
Macfie (2014)	USA	31 children of mothers with BPD 31 children of comparison mothers 4-7 years	44 mothers with BPD 43 comparison mothers	SCID-II ( $\geq 5$ ) PAI (continuous)	High Risk Clinical & Community	Case-control	Interview Play observation Story completion through play AAI	To examine relationships between mothers' attachment, observed maternal parenting and children's narrative representations in children of and mothers with BPD
Marantz (1991)	USA	16 boys with GID 17 boys without GID 8 years	16 mothers of boys with GID 17 mothers of boys without GID	DIB (continuous)	Clinical	Case-control	Questionnaire Interview	To compare the psychopathology and parenting attitudes and practices of mothers of boys with GID with mother of boys without GID
Newman (2007)	Australia	14 infants of mothers with BPD 20 infants of control mothers 3-36 months	14 mothers with BPD 20 community mothers	DSM-IV DIB-R ( $\geq 8$ )	Clinical	Case-control	Questionnaire Interview Mother-infant play	To investigate the parenting attributes of mothers with BPD by assessing parenting perceptions and mother-infant interactions
Reinelt (2014)	Germany	295 offspring T <sub>0</sub> 15 years T <sub>1</sub> 20 years	230 mothers assessed for BPD (in community sample)	SCID-II ( $\geq 5$ )	Community	Cohort Longitudinal	Questionnaire Interview	To test longitudinally whether maladaptive mother-child interactions mediate the relationship between maternal borderline symptoms and BPD symptoms in offspring
Schacht (2013)	UK	39 children 3-5 year olds	20 mothers with BPD 19 mothers without BPD	SCID-II ( $\geq 5$ ) at T <sub>i</sub> , T <sub>2</sub> or both	High risk/clinical (from longitudinal cohort)	Case-control	Questionnaire Interview Affective labelling & False belief tasks	To investigate associations between maternal mind-mindedness of mothers with BPD and mental state understanding their children with comparison mother-children dyads without PD
Stepp (2013)	USA	T <sub>1</sub> 360 adolescents with depressive disorder, 284 with nonmood disorders, 457 no psychiatric history; 14-18 years T <sub>2</sub> 1507 T <sub>1</sub> adolescents 15-19 years T <sub>3</sub> 644 adolescents history psychiatric illness 457 without, 24 years T <sub>4</sub> 816 T <sub>3</sub> participants, 30 years	T <sub>4</sub> 701 mothers BPD assessed	K-SADS SCID-NP SCID-II ( $\geq 5$ ) T <sub>1</sub> , T <sub>4</sub> IPDE T <sub>4</sub>	High risk (from longitudinal cohort)	Cohort Longitudinal	Questionnaire Interview	To determine associations between maladaptive family functioning, parental psychopathology, proband early onset psychopathology and BPD symptoms in adulthood.
Weiss (1996)	Canada	21 children of mothers with BPD 23 children of mothers with nonborderline PD 4+ years, mean BPD group: 12 years, control group: 9.5 years	9 mothers with BPD 14 mothers with nonborderline PD	DIB-R ( $\geq 8$ )	Clinical	Case-control	Questionnaire Interview	To compare the psychopathology of children of mothers with BPD with children of mothers with any other PD
Whalen (2015)	USA	98 infants of mothers with mood, relationship and impulse control difficulties 12-23 months	23 mothers clinically relevant levels BPD 75 mothers low BPD	BEST	High risk community	Cross-sectional	Mother-report Lab observation	The investigate the mothers with BPD symptoms perception of infant emotion expressions (fear and anger) compared with observed infant expressions

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White (2011)	USA	87 infants Mean 3.5 months	17 mothers with BPD 25 mothers with MDD 20 mothers with BPD/MDD 25 healthy control mothers	SCID-IV ( $\geq 5$ ) IPDE DIB-R ( $\geq 8$ )	Clinical	Case-control	Questionnaire Interview Mother-child play	To compare mother-infant interactions of mothers with BPD with mothers with MDD, BPD/MDD and mothers with no psychiatric disorder
Wilson (2012)	USA	113 mother-child dyads 3 to 6 years	145 community parents 113 mother-child dyads BPD assessed	IPDE-S continuous	Community (as part of a larger study)	Cross-sectional	Questionnaire Mother-child tasks	To examine the effect of parental PD symptoms on parenting behaviours and parent-child interactions
Zalewski (2014)	USA	1598 adolescent girls 15-17 years	1598 mothers c.8% with IPDE $\geq 4$ (in the clinically significant range for BPD)	IPDE ( $\geq 4$ ) IPDE-BOR continuous	High risk (from a longitudinal cohort)	Cross-sectional from Cohort	Questionnaire Interview	To examine associations between maternal BPD symptoms and parenting behaviours and adolescent girls' temperament

Notes: AAI = Adult attachment Interview; BEST = Borderline Evaluation of Severity Overtime; BP = borderline personality; BPD = borderline personality disorder; DD = dysthymic disorder; DIB = Diagnostic Interview for Borderlines; DIB-R = Diagnostic Interview for Borderlines revised; DSM= Diagnostic Statistical Manual for Mental Disorders; GID = gender identity disorder; IPDE = International Personality Disorders Examination; IPDE-S = International Personality Disorders Examination Screener; K-SADS = Schedule for Affective Disorders and Schizophrenia for School-age Children; MCMI III = Millon Clinical Multiaxial Inventory; MDD = Major depressive Disorder; PAI = Personality Assessment Inventory; PAI-BOR = Personality Assessment Inventory, borderline ; PD = personality disorder; PDE = Personality Disorder Examination; PDQ-4 = Personality Diagnostic Questionnaire; PSC = Pediatric Symptom Checklist; SCID-II = Structured Clinical Interview for Diagnostic and Statistics Manual-IV Axis II; SCID-NP = Structured Clinical Interview, non-patient version; SCID-Q = Structured Clinical Interview for DSM III, patient version; SIDP-IV = Structured Interview for DSM-IV; ZAN-BPD = Zaranini Rating Scale for Borderline Personality Disorder

\*A term used in the Millon Clinical Multiaxial Inventory, for symptoms that closely correspond to BPD

**Table 2: Parenting behaviours of mothers with BPD**

Parenting measure	Author (year)	Measurement tool	Comparison groups	Statistical data	Overall finding for mothers
Sensitivity	Crandell (2003) Newman (2007) Howard (1995)	(Post)Still face paradigm Mother-child play: EA (Biringen, 2009) HOME inventory (Caldwell & Bradley, 1985)	BPD; HC BPD; HC Borderline-cycloid cocaine abusers	$M_{BPD}=7.2, M_{HC}=12.7, p<.025$ $M_{BPD}=5.14, SD=1.38; M_{HC}=6.47, SD=0.94, p<.05$ $r = -.28, p<.05$ (high BPD scores in pregnancy/ lower maternal sensitivity 6 months later)	Low maternal sensitivity
Insensitivity	Kiel (2011)	Strange Situation (Ainsworth et al, 1978)	High BP pathology; low BPD pathology	$Ns$ initial infant distress but insensitive when distress persisted: $\beta=1.13, t=4.22, p<.001$	
(Non) intrusiveness Intrusive/negativity	Crandell (2003) Hobson (2009)  Zalewski (2014)	(Post) Still face paradigm Strange Situation: AMBIANCE (Lyons-Ruth et al, 1999) CRPBI (Schludermann & Schludermann, 1971)	BPD; HC BPD; depression; HC  BPD symptoms (assessed in community sample)	$M_{BPD}=7.9, M_{HC}=12.2, p<.05$ $M_{BPD}=5.77, SD=4.85; M_{dppn}=2.67, SD=2.77;$ $M_{HC}=3.19, SD=4.45, higher but ns$ $Ns$ correlation (maternal BPD/intrusiveness)	High intrusiveness
(Non) intrusive sensitivity Intrusive insensitivity	Crandell (2003) Hobson (2005)	(Pre) Still face paradigm Mother-child play (adapted from Murray et al, 1996)	BPD; HC BPD; HC	$M_{BPD}=7.3, M_{HC}=12.6, p<.05$ $M_{BPD}=6.0, SD=1.1; M_{HC}=4.1, SD=2.5, p<.01$	High intrusive insensitivity
Overprotection	Elliot (2014)  Barnow (2006)  Reinelt (2014)  Zalewski (2014)	PACOTIS  EMBU – adolescent report  EMBU – adolescent report  CRPBI	BPD; HC  BPD; depression; cluster c PD; HC  BPD symptoms (assessed in community sample)  BPD symptoms (assessed in community sample)	$M= 6.42, SD= 1.95; M_{HC}=3.45, SD=1.6, p<.001$ $r = .63, p=.02$ (BPD severity/ overprotection) $M= 2.36, SD= 0.43; M_{HC}=2.12, SD=0.42; M_{Dppn}=2.12,$ $SD= 0.45; M_{CPD}=2.13, SD= 0.39, p<.05$ $r = .14, p<.05$ (maternal BPD symptoms/ overprotection) $r = .13, p<.01; r = -.10, p<.01$ (maternal BPD/control through guilt; maternal BPD/acceptance of individuation)	More overprotective
Emotional warmth	Harvey (2011)  Herr (2008)  Reinelt (2014)  Barnow (2006)	Mother-child play, clean-up and forbidden objects observation tasks Perceived parenting quality questionnaire adolescent report (Ge et al., 1996) EMBU – adolescent report (Perris et al., 1980) EMBU – adolescent report	Mothers of children with behavioural problems MDD; DD; MDD/DD; HC (BPD symptoms assessed) BPD symptoms (in community sample) BPD; depression; cluster c PD; HC	$r = -.27, p<.001$ (BPD/emotional warmth) $Ns$ correlation (maternal BPD/warmth, controlling for family income/gender) $Ns$ correlation (maternal BPD/warmth) $M_{BPD}= 2.79, SD= 0.55; M_{HC}=2.83, SD=0.54; M_{Dppn}$ $=2.90, SD= 0.46; M_{CPD}=2.91, SD= 0.61, Ns$	Mixed results with emotional warmth
Hostility	Elliot (2014)  Frankel-Waldheter (2015)  Herr (2008)  Harvey (2011)	PACOTIS (Boivin et al, 2005) self-report  Adapted Relationship Problem Inventory (Knox, 1971); Autonomy and relatedness coding system (Allen et al., 2005) Perceived parenting quality questionnaire adolescent report Mother-child observation tasks; home	BPD; HC  BPD; HC  MDD; DD; MDD/DD; HC  BPD symptoms	$M_{BPD}=2.24, SD=2.21; M_{HC}=2.18, SD=1.87, p=.08 Ns$ $r = .71, p=.01$ (BPD symptom severity/hostility) $F(1, 52)= 5.63, p<.05$  $r = -.17, p<.001$ (maternal BPD/hostility)  $r = .21, p<.05$ (maternal BPD/negative affect);	Increased hostility

	Newman (2007)	interaction, Parenting Scale (Arnold, 1993) SCL-90-R (Derogatis, 1983)	BPD; HC	$r = -.22, p < .01$ (BPD/overreactivity) $M_{BPD} = 63.77, SD = 12.59; M_{HC} = 48.50, SD = 7.76,$ $p < .001$ yet <i>ns</i> interaction style - non-hostility (EA)	
	Zalewski (2014)	Mother-child play: EA CRPBI	BPD symptoms (community)	$r = .15, p < .01$ (maternal BPD/harsh punishment)	
Rejection/laxness	Barnow (2006) Reinelt (2014)	EMBU – adolescent report EMBU – adolescent report	BPD; depression; C PD; HC BPD symptoms (assessed in community sample)	<i>Ns</i> (rejection) $r = .12, p < .05$ (maternal BPD/rejection) $r = .22, p < .01$ (offspring BPD/rejection) $r = .40, p < .001$ (maternal BPD/laxness)	Mixed results for rejection
	Harvey (2011)	Mother-child observation tasks;	BPD symptoms		
Emotion recognition	Elliot (2014)	Infant emotion recognition task	BPD; HC	$F(1, 24) = 14.39, p < .001; M_{BPD} = 1.77, SD = 1.36;$ $M_{HC} = 0.23, SD = 0.60, p = .003$ (misattribution neutral faces); $M_{BPD} = 1.54, SD = 1.26; M_{HC} = 0.23, SD = 0.60,$ $p = .004$ (perceive neutral as sad) $r = .7, p = .01$ (misattribution/duration of BPD) $\beta = 0.34, t = 3.56; p = .001$ (mother report, BPD, mean obs anger) $\beta = 0.34, t = 3.56; p = .001$ (high obs anger) <i>ns</i> (low obs anger) <i>ns</i> (fear interaction)	
	Whalen (2015)	TBAQ (Goldsmith, 1996)	BPD symptom severity		
Parenting stress	Elliot (2014)	PSI-SF (Abidin, 1995)	BPD; HC	$M = 89.31, SD = 30.39; M_{HC} = 52.46, SD = 11.08, p < .01$ $r = .81, r = .88, p < .01$ (stress/emotion regulation)	Higher stress/distress
Parenting distress	Newman (2007) Elliot (2014) Newman (2007)	PSI-SF PSI-SF PSI-SF	BPD; HC BPD; HC BPD; HC	$M = 84.57, SD = 19.50; M_{HC} = 66.20, SD = 12.74, p < .001$ $M = 37.85, SD = 11.44; M_{HC} = 19.46, SD = 6.5, p < .001$ $M = 36.50, SD = 8.56; M_{HC} = 24.95, p < .001$ $r = -.79, p < .001$ (distress/dissatisfaction) $r = -.56, p < .001$ (distress/efficacy) $r = -.40, p < .05$ (distress/less sensitive parenting)	
Parenting satisfaction/ Perceived parenting efficacy	Newman (2007) Elliot (2014)	PSOC PSOC	BPD; HC BPD; HC	$M = 30.28, SD = 7.89; M_{HC} = 40.80, SD = 4.89, p < .001$ $M = 7.24, SD = 1.62; M_{HC} = 8.83, SD = 1.08, p < .01$ $M = 6.95, SD = 1.85; M_{HC} = 9.54, SD = 0.77, p < .001$ (perceived effect of their behaviour on infant)	Lower parenting satisfaction Lower perceived parenting efficacy
Perceptions of pregnancy	Newman (2007) Blankley (2015)	PSOC Case record reviews	BPD; HC BPD	$M = 25.93, SD = 6.34; M_{HC} = 32.10, SD = 4.54, p < .001$ 31% pregnancy traumatic; 12% anticipated traumatic delivery; 31% request early delivery; 38% low antenatal engagement	Poor perinatal experiences
Perceptions of child	Schacht (2013) Crittenden (2010) Elliot (2014) Newman (2007)	Maternal mind-mindedness brief interview (Meins & Fernyhough, 2010) WMCI (Zeanah & Benoit, 1995) PSI-SF PSI-SF	BPD; HC BPD; HC BPD; HC BPD; HC	$46\%, SD = .25,$ versus $68\%_{HC}, SD = .22, p < .005$ (fewer mind-related descriptions) <i>Ns</i> (balanced representations of child) $r = .64, p = .02$ (maternal ER/difficult child) <i>Ns</i> (maternal BPD/difficult child)	Mixed representations of child

Notes: AMBIANCE = Atypical Maternal Behavior Instrument for Assessment and Classification; BPD = Borderline personality disorder; CRPBI = Child Report of Parent Behavior Inventory; DD = Dysthymic disorder; EA = Emotional Availability scale; EMBU = 'own memories concerning upbringing' inventory; HC = healthy control; HOME = Home Observation for Measurement of the Environment; MDD = Major depressive disorder; PACOTIS = Parental Cognitions and Conduct Towards the Infant Scale; PD = personality disorder; PSI-SF = Parenting Stress Index-short form; PSOC = Parenting Sense of Competence Scale; SCL-90-R = Symptom Checklist 90-revised; TBAQ = Toddler Behavior Assessment Questionnaire; WMCI = Working Model of the Child Interview

**Table 3: Mother-offspring interaction dynamics**

Interaction dynamic	First author (year)	Measurement tool	Comparison Groups	Statistical data	Overall interaction outcome
Mother-offspring interaction <i>Difficult interaction</i>	Elliot (2014)	PSI-SF	BPD; HC	$M_{BPD}=25.15, SD = 11.76; M_{HC} = 15.62, SD= 3.78, p<.05; r = .65, p=.02$ (maternal ED/difficult interaction)	Difficult mother-offspring interactions
<i>Withdrawal</i>	Hobson (2009)	Strange Situation (Ainsworth et al, 1978); AMBIANCE (Lyons-Ruth et al, 1999)	BPD; Depression; HC	$Ns$ (maternal BPD/withdrawal)	
<i>Dysfunctional interaction</i>	Newman (2007)	Mother-child play: EA (Biringen, 2009); PSI-SF	BPD; HC	$M = 21.0, SD = 7.58; M_{HC}=16.75, SD =3.78, p<.05$	
<i>Interaction satisfaction</i>	Crandell (2003)	Still-face paradigm, Global ratings for mother-child interactions (Murray et al, 1996)	BPD; HC	$M_{BPD}=7.8, M_{HC} = 12.3, p<.05$	
<i>Mother interaction behaviours</i>	Hobson, (2009)	Strange situation: AMBIANCE	BPD; Depression; HC	$M = 6.0, SD = 4.67; M_{Dpn} =2.73, SD = 2.94; M_{HC}=2.55, SD =2.55, p<.01$ (maternal frightened/disoriented)	Less responsive maternal interactions
	Newman (2007)	Mother-child play: EA	BPD; HC	$M = 3.89, SD = 0.81; M_{HC}=4.35, SD =0.63, p<.05$ (less structured in organising activities)	
	White (2011)	Mother-child play, Interaction Rating Scale (Field, 1980)	BPD; BPD/MDD; MDD; HC	$BPD 30.1%; BPD/MDD 31.7%; MDD 62.4%; HC 62.9%, p<.05$ (touching); $BPD 3%; BPD/MDD 3.7%; MDD 12.1%; HC 9.1%, p<.05$ (game playing); $BPD 7.7%; BPD/MDD 7.8%; MDD 16.1%; HC 33.1%, p<.05$ (smiling); $BPD 0.25%; BPD/MDD 3.9%; MDD 4.5%; HC, 6.9%, p<.05$ (imitation)	
	Wilson (2012)	Mother-child play tasks	PD symptoms	$r = -.26, p<.01$ (maternal responsiveness/child's bids for attention)	
<i>Mother-offspring role-reversal</i>	Macfie (2009)	The Narrative Coding Manual Rochester Version	BPD; HC	$M_{BPD}= 0.87, SD=1.01; M_{HC}=0.37, SD=0.49, p<.05$ (child narratives)	Mother-offspring role reversal
	Macfie (2014)	Narrative Emotion Coding	BPD; HC	$r = .31, p<.05$ (maternal BPD/child narratives role reversal)	
	Hobson (2009)	AMBIANCE	BPD, Depression, HC	$Ns$	
<i>Autonomy and relatedness</i>	Frankel-Waldheter (2015)	Adapted Relationship Problem Inventory (Knox, 1971); Autonomy and relatedness coding system (Allen et al., 2005)	BPD; HC	$F(1, 52) = 11.38, p<.01$ (maternal engagement) $F(1, 52) = 4.81, p<.05$ (promote relatedness) $F(1, 52) = 13.64, p<.01$ (inhibit autonomy) $F(1, 52) = 4.02, p<.05$ (inhibit relatedness)	Inhibits autonomy and relatedness; less likely to promote relatedness; less engaged
	Zalewski (2014)	CRPBI (Schludermann & Schludermann, 1971)	BPD symptoms	$r = -.10, p<.01$ (BPD/acceptance of individuation)	
Communication <i>Maternal communication</i>	Delavenne (2008)	Mother-child free interaction	BPD; HC	$M_{BPD}=2668, M_{HC}=2278, p<.0001$ (phrase length) $M_{BPD}=2.65, M_{HC}=0.47, p<.005$ (non-vocal sounds)	Poorer quality of maternal vocalisation

Interaction dynamic	First author (year)	Measurement tool	Comparison Groups	Statistical data	Overall interaction outcome
Infant communication	Hobson (2009)	Strange Situation; AMBIANCE	BPD; depression; HC	$M_{BPD}=2.65, M_{HC}=0.77, p<.004$ (pause length) BPD 85%; Depression 47%; HC 42%, $\chi^2=6.97, p<.05$ (disruptive affective communication)	
	White (2011)	Mother-child play, Interaction Rating Scale	BPD; BPD/MDD; MDD; HC	<i>Ns</i> (vocalisation)	
	Delavenne (2008)	Mother-child free interaction	BPD; HC	$M_{BPD}=3.29, M_{HC}=11.17, p<.0001$ (vocalisation) $M_{BPD}=548.7, M_{HC}=759.8, p<.027$ (duration)	Fewer infant communications
Mother-infant communication	White (2011)	Mother-child play, Interaction Rating Scale	BPD; BPD/MDD; MDD; HC	BPD 19.2%; BPD/MDD 19.8%; MDD 33.4%; HC 34.4%, $p<.05$ (vocalisation)	
Mother-infant communication	Delavenne (2008)	Mother-child free interaction	BPD; HC	$M_{BPD}=1.53, M_{HC}=4.82, p<.001$ (dyadic vocalisation)	Fewer simultaneous conversation
Infant/child behaviour involvement/engagement	Crandell (2003)	Still-face paradigm, Global ratings for mother-child interactions	BPD; HC	<i>Ns</i> (engagement during and post SFP)	Mixed results for infant engagement and responsiveness to maternal attempts to engage
	Hobson (2005)	Modified Set Situation (Murray et al, 1996)	BPD; HC	$M= 3.2, SD= 2.0; M_{HC}=5.4, SD =2.3, p<.05$ (availability for positive engagement)	
	Newman (2007)	Mother-child play: EA	BPD; HC	$M= 5.04, SD= 0.93; M_{HC}=6.10, SD =0.70, p<.05$ (involvement) $M= 5.14, SD= 1.00; M_{HC}=5.82, SD =0.78, p<.05$ (responsiveness to maternal attempt to engage)	
Infant eye contact	Wilson (2012)	Mother-child play tasks	BPD symptoms	<i>Ns</i> (infant responsiveness/mother's bid for attention)	
	Crandell (2003)	Still-face paradigm, Global ratings for mother-child interactions	BPD; HC	$M_{BPD}=14.9, M_{HC} = 7.5, p<.05$ (looking away during SF) $M_{BPD}=12.9, M_{HC} = 8.9, p<.05; M_{BPD}=12.9, M_{HC} = 8.9, p<.05$ (dazed looks during and post SFP)	Reduced eye contact
	Hobson (2005)	Modified Set Situation	BPD; HC	$M=27.5, SD=17.4; M_{HC}=56.8, SD=34.2, p<.01$ (directed looks with stranger)	
Infant affect	White (2011)	Mother-child play, Interaction Rating Scale	BPD; BPD/MDD; MDD; HC	BPD 27.4%; BPD/MDD 48.7%; MDD 43.3%; HC 22.1%, $p<.001$ (gaze aversion)	
	Crandell (2003)	Still-face paradigm, Global ratings for mother-child interactions	BPD; HC	<i>Ns</i> (positive affect during SFP); $M_{BPD}=7.7, M_{HC} = 12.3, p<.05$ (positive affect post SFP)	Lowered infant affect
	Hobson (2005)	Modified Set Situation	BPD; HC	$M_{BPD}= 17.8, SD=4.7; M_{HC}=22.9, SD=7.0, p<.05$ (mood state/behavioural organisation in interactions)	
	White (2011)	Mother-child play, Interaction Rating Scale	BPD; BPD/MDD; MDD; HC	BPD 12.2%; BPD/MDD 12.4%; MDD 39.5%; HC 41.1%, $p<.05$ (smiling)	

**Notes:** AMBIANCE = Atypical Maternal Behavior Instrument for Assessment and Classification; BPD = borderline personality disorder; CRPBI = Child Report of Parent Behavior Inventory; EA = Emotional Availability scale; ED = emotional dysregulation; HC = healthy control group; MCS = Mother Chronic Stress Interview; MDD = Major depressive disorder; PD = personality disorder; PSI-SF = Parenting Stress Index-short form; SFP = still face paradigm



**Table 4: Outcomes for children of mothers with BPD**

Offspring outcome	First author (year)	Measurement tool	Comparison Groups	Statistical data	Overall offspring outcome
Psychopathology BPD	Barnow (2013)	SCID II DSM-IV (First et al 1996)	Mother with BPD T <sub>0</sub> ; offspring T <sub>1</sub> (5 years on)	$R_{SR} = .18, p < .01; r_{INT} = .17, p < .01$ (Maternal BPD/offspring BPD from self-rated questionnaire and interview)	Significant association with maternal BPD and offspring BPD
	Cheng (2010)	PDQ-4	BPD symptoms; non-BPD	$pr = .086, p < .01$ (maternal BPD/offspring BPD traits)	
	Conway (2015)	SCID II DSM-IV	Mother BPD symptom T <sub>1</sub> ; offspring T <sub>2</sub> (5 years on)	$r = .10, p < .05$ (maternal BPD and offspring BPD symptoms)	
	Stepp (2013)	SCID II	Mother with BPD T <sub>1</sub> ; offspring T <sub>4</sub> (age 30)	$B = 1.23, SE = 0.04, p < .05$	
	Weiss (1996) Reinelt (2014)	CDIB SCID II; EMBU – adolescent report (Perris et al., 1980); CBCL; YSR	BPD; other PD BPD symptoms in mother BPD symptoms in child	$M_{BPD} = 33.3, M_{PD} = 8.7, \chi^2 = 4.50, p < .05$ $A = -0.01, ns; B = 0.31 (p < .01); C = 0.52, p < .01$ indirect path: 0.13, CI: 0.07-0.32. $p < .001$ (mediator-maladaptive mother-child interactions)	
BPD Symptoms <i>Emotional dysregulation</i>	Gratz, (2014)	Lab-TAB exercises (Goldsmith & Rothbart, 1999)	BPD symptoms	<i>Ns</i> (maternal BPD and infant ED)	Higher emotional dysregulation
	White (2011)		BPD; MDD; BPD/MDD; HC	$M_{BPD} = 2.14, SD = 0.81; M_{MDD} = 3.77, SD = 0.83; M_{BPD/MDD} = 3.87, SD = 0.79; M_{HC} = 3.62, SD = 0.71, p < .05$ (soothability)	
	Macfie (2009)	The Narrative Coding Manual Rochester Version (Robinson, et al., 1996)	BPD; HC	$M_{BPD} = 0.43, SD = 0.82; M_{HC} = 0.10, SD = 0.40, p < .05$ (reality/fantasy confusion) $M_{BPD} = 0.40, SD = 0.72; M_{HC} = 0.00, SD = 0.00, p < .01$ (self/fantasy confusion) $M_{BPD} = 1.03, SD = 1.87; M_{HC} = 0.17, SD = 0.38, p < .05$ (fantasy proneness)	
	Macfie (2014)	Narrative Emotion Coding (Warren et al, 1993)	BPD; HC	$r = .25, p < .05$ (maternal preoccupied unresolved AAI/child self-regulation) $r = .30, p < .05$ (maternal preoccupied unresolved AAI/self fantasy confusion)	
	Whalen (2015)	Social Skills Rating System (Elliott et al, 1988)	BPD severity	$r = .33, p < .01$ (maternal BPD/mother-report infant anger; infant fear <i>ns</i> )	
	Zalewski (2014)	Emotionality, Activity and Sociability Temperament Survey (Bus & Plomin, 1984)	BPD	$r = .30, p < .01$ (maternal BPD/adolescent self control) $r = -.13, p < .01$ (maternal BPD/adolescent negative emotionality)	
<i>Unstable self image</i>	Macfie (2009)	The Narrative Coding Manual Rochester Version	BPD; HC	$M_{BPD} = 0.20, SD = 0.41; M_{HC} = 0.0, SD = 0.0, p < .05$ (incongruent child)	Less stable self-image

Offspring outcome	First author (year)	Measurement tool	Comparison Groups	Statistical data	Overall offspring outcome
				$M_{BPD} = 0.17, SD=0.38; M_{HC}=0.0, SD=0.0, p<.01$ (shameful child) $M_{GID}=5.73, SD=1.66; M_{HC}=2.47, SD=1.82, p<.01$	
Suicide ideation	Marantz (1991)	DIB (Gunderson & Kolb, 1978)	Mothers of children with or without GID		
	Barnow (2006)	Three yes/no questions re suicide ideation	BPD, depression, cluster C PD; HC	Death wish 39%; suicide ideation/plans 26%; 3-9% in HC children $p<.05$	Higher suicide ideation
Attachment	Abela (2005)	IPPA (Armsden & Greenberg, 1987)	BPD/MDD; MDD	$pr = .19, p<.05$ (BPD/insecure attachment)	Insecure attachment profiles
	Gratz (2014)	Strange Situation (Ainsworth et al, 1978)	BPD symptoms; HC	48% BPD; 28% HC (insecure attachment)	
	Herr (2008)	Attachment Prototype Questionnaire (Bartholomew & Horowitz, 1991)	MDD; DD; MDD/DD; HC (BPD symptoms)	$r = -.10, p<.01$ (BPD/secure attachment) $r = .15, p<.001$ (BPD/fearful attachment)	
	Hobson (2005)	Strange Situation	BPD; HC	80% BPD; 27% HC, $p=.008$ (disorganised attachment)	
Depression	Abela (2005)	K-SADS (Kaufman et al, 1996) CDEQ (Abela & Taxel, 2001)	BPD/MDD; MDD	$pr = .36, p<.001$ (BPD/MDD; child depression) $r = .40, p<.01$ (Maternal BPD/child depression)	More likely to have depression symptoms and depression vulnerability factors
	Barnow (2006)	CBCL (Achenbach, 1994) YSR (Achenbach, 1994)	BPD, depression, cluster C PD; HC	CBCL: $M_{BPD} = 4.35, SD = 6.68, M_{Dpn} = 2.62, SD = 3.52, p<.10; M_{HC} = 1.51, SD = 2.24, p<.01$ YSR: $M_{BPD} = 8.55, SD = 7.15, M_{Dpn} = 6.04, SD = 4.47, M_{CPD} = 5.70, SD = 3.66, p<.10, M_{HC} = 4.61, SD = 4.17; p<.01$	
	Herr (2008)	K-SADS; BDI (Beck et al, 1988)	MDD; DD; MDD/DD; HC (BPD symptoms)	$B=0.25, SE=0.12, p<.05$ (youth BDI age 15) <i>Ns</i> when adding in maternal lifetime MDD	
Internalising symptoms	Barnow (2006)	CBCL; YSR	BPD, depression, cluster C PD; HC	CBCL: $M_{BPD} = 9.92, SD = 11.23; M_{Dpn} = 5.95, SD = 6.29, p<.05; M_{CPD} = 6.41, SD = 4.84, p<.10; M_{HC} = 3.69, SD = 4.34, p<.01$ YSR: $M_{BPD} = 16.35, SD = 11.56; M_{Dpn} = 11.34, SD = 7.56, p<.05; M_{CPD} = 11.48, SD = 6.65, p<.10; M_{HC} = 9.16, SD = 6.88, p<.01$ (emotional problems) <i>Ns</i> (internalising)	Mixed results on emotional/internalising problems
	Bertino (2012)	CBCL; YSR; ASR (Achenbach & Rescorla, 1997)	PDs		
	Frankel-Waldheter (2015)	Teacher report form (TRF) (Achenbach & Rescorla, 2001)	BPD; HC	Indirect effect of maternal autonomy/relatedness through maternal BPD	
	Jellinek (1991)	PSC (Murphy et al, 1985)	BPD; axis II; no axis II	$\chi^2 = 15.0, df=2, p<.001$ (PCS score)	
Externalising symptoms	Barnow (2006)	CBCL; YSR	BPD, depression, cluster	CBCL: $M_{BPD} = 8.13, SD = 6.38; M_{HC} = 3.95,$	Externalising/behavioural

Offspring outcome	First author (year)	Measurement tool	Comparison Groups	Statistical data	Overall offspring outcome
			C PD; HC	$SD=4.49, p<.01$ (behavioural problems) YSR: $M_{BPD}= 13.20, SD=8.11; M_{HC} = 9.72, SD=6.37, p<.10$ $r = .13, p<.05$ (BPD/externalising)	problems
	Bertino (2012) Frankel-Waldheter (2015) Jellinek (1991) Weiss (1996)	CBCL; YSR; ASR Teacher report form (TRF) PSC CDIB; CGAS (Shaffer, 1983)	PDs BPD; HC BPD; axis II; no axis II BPD; other PD	Indirect effect of maternal autonomy/ relatedness through maternal BPD $\chi^2 = 15.0, df=2, p<.001$ (PSC score) $M_{BPD}=77.8, M_{PD}=21.4 p<.001$ (ADHD) $M_{BPD}=88.9, M_{PD}=42.9; p<.05$ (disruptive behaviour including CD and ODD)	
General psychopathology	Barnow (2006)	CBCL; YSR	BPD, depression, cluster C PD; HC	CBCL: $M_{BPD} = 2.47, SD 2.30, M_{Dpn} = 1.41, SD=1.97; p<.05; M_{CPD} = 1.53, SD 1.78, p<.10; M_{HC} = 0.74, SD 1.24, p<.01$ YSR: $M_{BPD} = 3.30, SD 2.45; M_{HC} = 1.89, SD 1.92; p<.01$ (physical complaints) $r = .18, p<.01$ (Maternal BPD/general psychopathology)	Increased general psychopathology
	Barnow (2013)	SCL-90-R (Derogatis, 1977) Adolescent Severity Index of General Psychopathology	Mother with BPD T <sub>0</sub> ; offspring T <sub>1</sub> (5 years on)		
Psychosocial Self-esteem difficulties	Abela (2005) Barnow (2006)	CDEQ-S (Abela & Taxel, 2001); SEQ (Rosenberg, 1965) Self-Worth Scale (Rosenberg, 1985)	BPD/MDD; MDD BPD; HC; Depression, Cluster C PD	$pr = .19, p<.05$ (maternal history BPD/self- criticism); <i>Ns</i> (self-esteem) $C_{BPD}= 5.90, SD= 2.9; M_{HC}= 8.55, SD= 1.94,$ $p<.01; M_{Dpn}= 8.11, SD= 2.51; M_{C-PD} 8.38, SD=$ $2.03 ps<.01$ (self-esteem)	Self-criticism; mixed results for self-esteem
	Barnow (2006)	Temperament & Character Inventory (Schmeck & Poustka, 2001)	BPD; HC; Depression, Cluster C PD	$M_{BPD}= 19.57, SD= 5.96; M_{HC}= 15.35, SD= 6,$ $p<.01; M_{Dpn} = 15.87, SD 5.32, p<.05; M_{CPC}=ns$ (harm avoidance)	Increased harm avoidance temperament
	Zalewski (2014)	Emotionality, Activity and Sociability Temperament Survey (Buss & Plomin, 1984)	BPD symptoms	<i>Ns</i> (temperament moderating association between maternal ED and maladaptive parenting)	
Interpersonal difficulties	Schacht (2013) Barnow (2006) Herr (2008)	Affective-labelling task (Denham, 1986); Causes of emotion interview (Cassidy, 1992) YSR Self-perception profile for adolescents (Harter, 1988)	BPD; HC BPD MDD; DD; MDD/DD; HC (BPD symptoms)	$M_{BPD}= 11.28, SD= 3.58; M_{HC}= 13.79, SD= 1.14,$ $p<.01$ (emotion labelling) $M_{BPD}= 8.70, SD= 3.63; M_{HC}= 13.58, SD= 3.10,$ $p<.01$ (understanding causes of emotion) $F=3.429; p=.017$ $r = -.10, p<.05$ (Maternal BPD/adolescent perception close friendships) $r = -.10, p<.05$ (Maternal BPD/adolescent perception social acceptance)	Interpersonal difficulties
Home difficulties	Feldman (1997)	FSS (Olsen & Wilson, 1982)	BPD; other PDs	<i>Ns</i> (but low for both groups re family	Low family satisfaction,

Offspring outcome	First author (year)	Measurement tool	Comparison Groups	Statistical data	Overall offspring outcome
		FES (Moos & Moos, 1986)		satisfaction) $M_{BPD}=31, SD = 21, M_{PD}=52, SD = 11, p<.01$ ; $M_{BPD}=39, SD = 13, M_{PD}=49, SD = 10, p<.05$ (cohesion; organisation - mother report) <i>Ns</i> (but low for both groups re family cohesion, expressiveness, encourage individuality -child report) $r = .13, p<.001$ (family stress-youth report); $r = .23, p<.001$ (chronic stress in the relationship - mother report)	cohesion, organisation; family stress; negative mother-child relationship expectations
	Herr (2008)	MCS; YCS (Adrian & Hammen, 1993)	MDD/DD; MDD; DD; HC (assessed for BPD symptoms)	$M_{BPD}= 2.43, SD=1.33; M_{HC}=3.43, SD=1.48, p<.05$ (negative mother-child relationship expectation - child narratives) $r = .44, p<.001$ (child report of mother-child relationship expectations/maternal parenting)	
	Macfie (2009)	The Narrative Coding Manual Rochester Version (Robinson, et al., 1996)	BPD; HC		
	Macfie (2014)	Narrative Emotion Coding (Warren et al, 1993)	BPD		
Stability Change school Changes in household Parental alcohol/drug abuse Maternal suicide attempts	Feldman (1995)	FTRI (ref) FES (Moos & Moos, 1986)	BPD; other PD	$M_{BPD}= 2, SD=1.7; M_{PD}=1, SD=0.8, p<.05$ $M_{BPD}= 2, SD=1.8; M_{PD}=1, SD=1.3, p<.05$ $\chi^2=4.11, p<.05$ $\chi^2=6.50, p<.01$ (aware of); $\chi^2=8.85, p<.05$ (witnessed)	Home/school instability and exposure to invalidating environments
General impairment	Blankley (2015)	Retrospective case reviews	BPD; HC	Pre term birth: Odds ratio 2.17, $p<.05$ Resuscitation: Odds ratio 2.00, $p<.05$ APGAR >7: Odds ratio 2.43, $p<.05$	Poorer general outcomes outcomes
	Weiss (1996)	CDIB; CGAS	BPD; other PD	$M_{BPD}=4.0, M_{PD}=2.4, p<.05$ (no. diagnoses & lower CGAS scores)	

**Notes:** AAI = Adult Attachment Interview; ADHD = attention deficit hyperactivity disorder; ASR = Adolescent Self-Report; BDI = Beck Depression Inventory; BPD = borderline personality disorder; CBCL = Child Behaviour Checklist; CD = conduct disorder; CDEQ = Children's Depressive Experiences Questionnaire; CDEQ-S = self-criticism subscale; CDIB = Child Diagnostic Interview for Borderlines; CGAS = Child Global Assessment Scale; DD = Dysthymic disorder; DIB = Diagnostic Interview for Borderlines; EMBU = 'own memories concerning upbringing' inventory; FES = Family Environmental Scale; FSS = Family Satisfaction Scale; FTRI = Family Trauma & Resilience Interview; GID = gender identity disorder; HC = healthy control group; IPPA = Inventory of Parent and Peer Attachment; K-SADS = Schedule for Affective Disorders and Schizophrenia for School-age Children; Lab-TAB = Laboratory Temperament Assessment Battery; MDD = Major depressive disorder; ODD = oppositional defiance disorder; PD = personality disorder PSC = Pediatric Symptom Checklist; PDQ-4 = Personality Disorder Questionnaire-4; ED = emotion dysregulation; SCID-II DSM-IV = Structured Clinical Interview for Diagnostic and Statistics Manual-IV Axis II Personality Disorders; SCL-90-R = Symptom Checklist Revised; SEQ = Self-Esteem Questionnaire; YCS = Youth Chronic Stress interview; YSR = Youth Self-Report