

Effects of postnatal depression on the child: developmental mechanisms

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Impact on the child

- Postnatal depression occurs at a time:-
 - of maximum infant dependency
 - when infants are highly sensitive to others' communication

7 picture slides to follow

Postnatal Depression and Mother child interactions 4-6 mths

High risk samples

General insensitivity, with two broad patterns:

-PND mothers either remote and disengaged, or hostile and intrusive;

in turn,

-the infants avoid contact and become distressed

(Field, 1984; 1985; 1988; Cohn, 1986)

Low risk samples

PND mothers less sensitive, but disturbance more subtle:

-problems occur especially with boys, or in chronic depression

-infants not so obviously affected

(Campbell et al, 1995; Murray et al, 93/96; Weinberg et al., 2006)

Video examples

Later mother-child relationship

- Persisting interaction difficulties

Martins & Gaffen, 2000 insecure attachment

Stein et al, 1991 19 mths

Cox et al, 1987 2-3 yrs

Murray et al, 1999 5 years

Effects of PND on later child development

Key questions concerning mechanisms

- Role of associated risk
- Role of early maternal interactions
 - are different kinds of interaction difficulty associated with different outcomes?

Child Outcomes

- Cognitive development: IQ and school achievements
- Behaviour regulation problems in childhood
- Depressive disorder in adolescence

The Cambridge longitudinal study

- Representative, low risk, community sample of 100 mother-infant pairs recruited at birth, screened and followed up through infancy, and at 5,8,13 and 16 years (current follow up at 22 years).
- 58 mothers had PND
- At least 93% retention throughout

Postnatal depression and cognitive development in infancy

Associations with adverse child outcome

Lyons-Ruth, 1986	12 m	high risk
Murray, 1992, 1996	18 m	low risk
Cornish, 2005	15 m	only if subs depression

Postnatal depression and cognitive development in early childhood

Associations with poor outcome

Cogill et al, 1986	4 yrs	but only if low maternal education
Sharp et al, 1995	4 yrs	boys only, disadvantaged sample
Hay et al, 2001	11 yrs	“ “ “
Milgrom et al, 2004	4 yrs	inpatient clinic sample

Lack of association with poor outcome

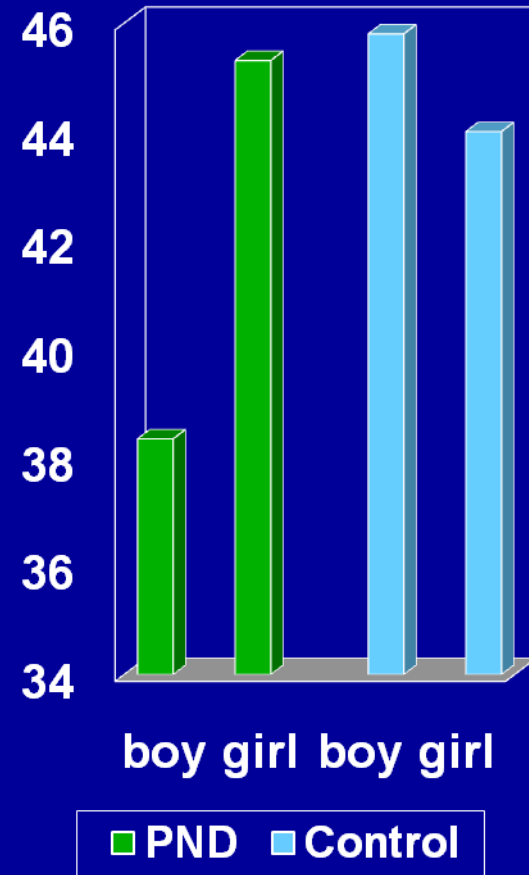
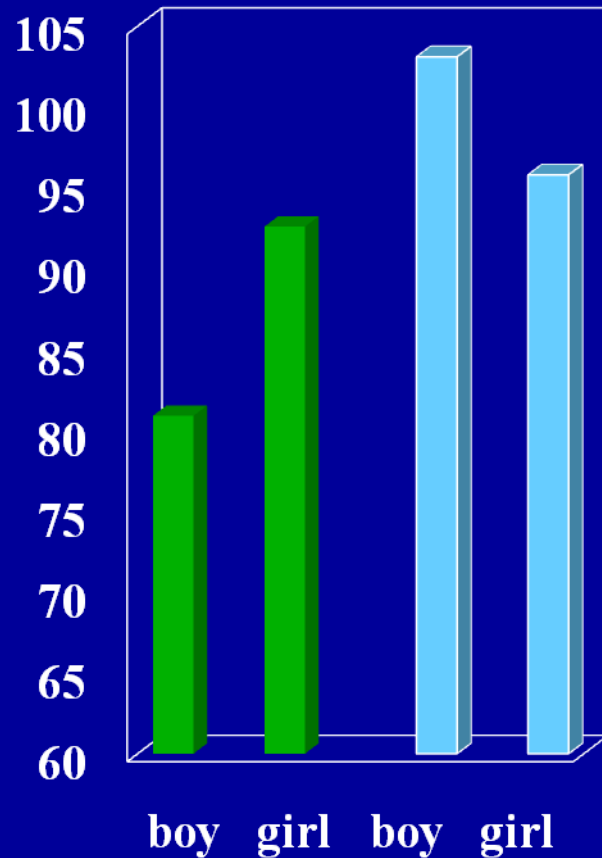
Murray et al, 1996	5 yrs	low risk sample
Kurstjens & Wolke, 2001	6 yrs	“ “

General depression and cognitive development in early childhood

Large population samples

NICHD 1999	3 yrs	chronicity, esp in low SES
Petterson & Burke-Albers, 2001	2-4 yrs	severity and chronicity
Brennan et al., 2001	5 yrs	severity and chronicity

PND and cognitive development in adolescence: IQ (*Hay et al., 2010*) and GCSE (*Murray et al. 2010*)



How do mother-child interactions affect cognitive development?

- General reduced responsiveness (*Murray et al., 1993; NICHD, 1999; Milgrom et al., 2004*)
- Lack of contingency & learning (*Tronick & Weinberg, 1997; Stanley et al., 2004*)
- Modulation of input to sustain attention (*Kaplan et al., 1999*)
- Reduced, and less responsive book sharing (*Reissland et al., 2002; Paulson et al., 2006*)

How do mother-child interactions affect cognitive development?

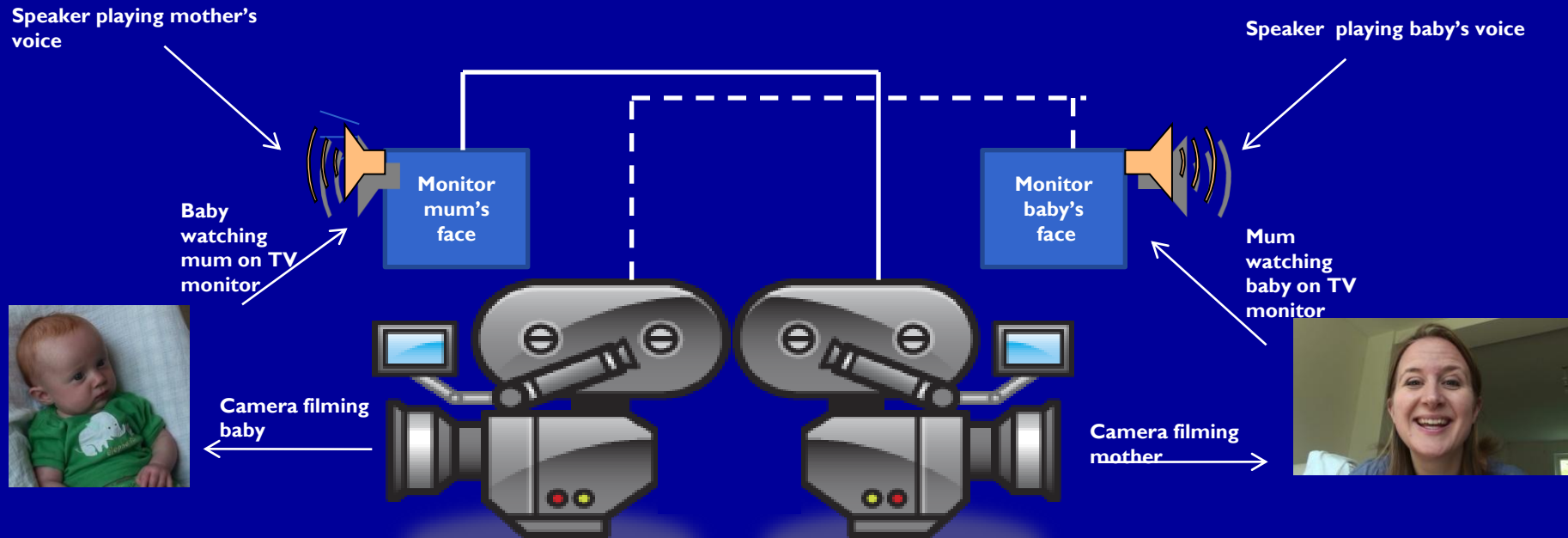
- General responsiveness (*Murray et al., 1993; NICHD, 1999; Milgrom et al., 2004*)

9 picture slides to follow

How do mother-child interactions affect cognitive development?

- Lack of contingency & learning (*Tronick & Weinberg, 1997; Stanley et al., 2004*)

Non-contingency: the Double Video Experiment (*Murray & Trevarthen, 1985*)



Interactive Disruption-Double Video Experiment: Live

Iris watches her mother who is *contingently* responding to her behaviour



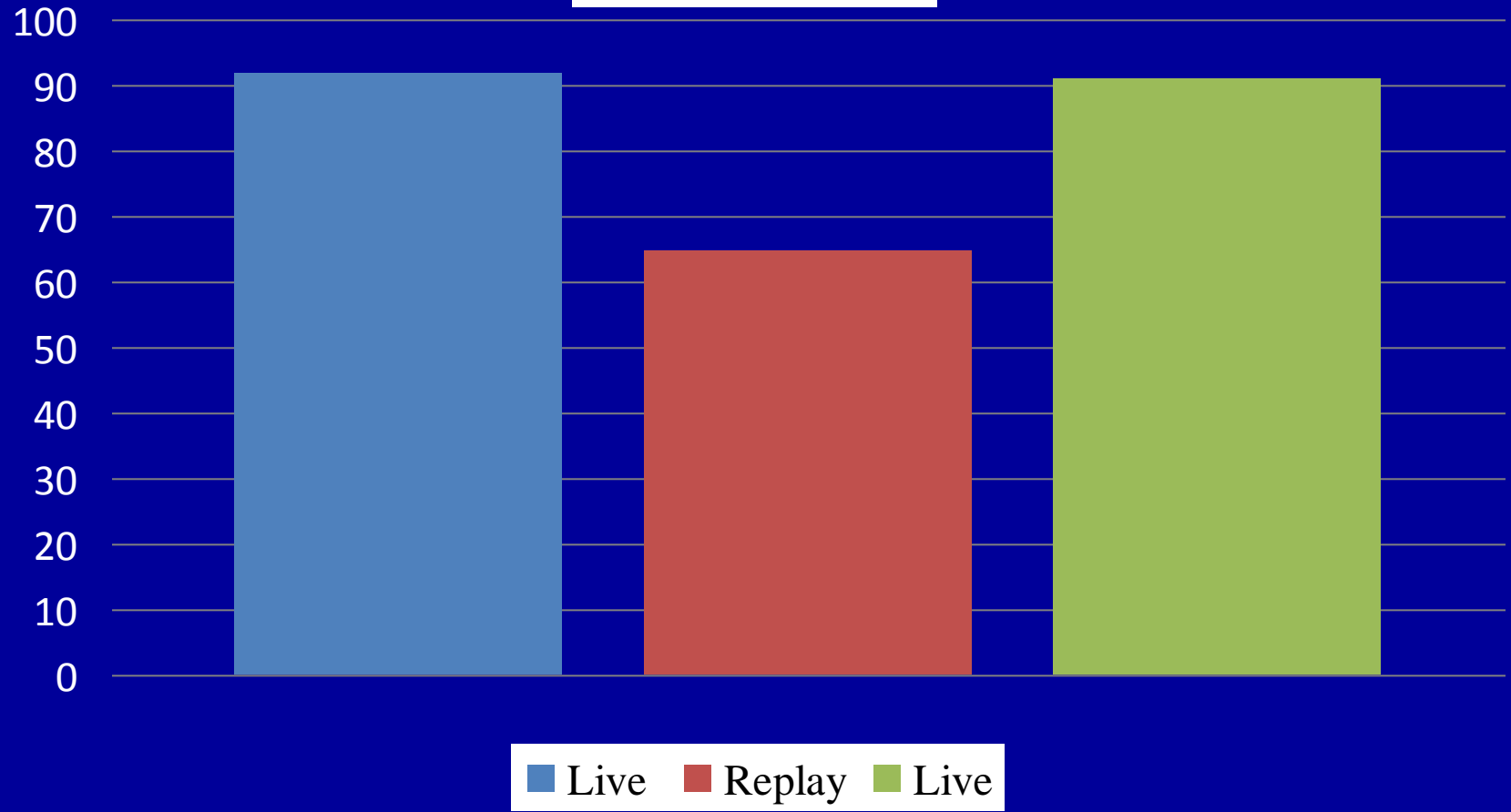
Interactive Disruption- Double Video experiment: Replay



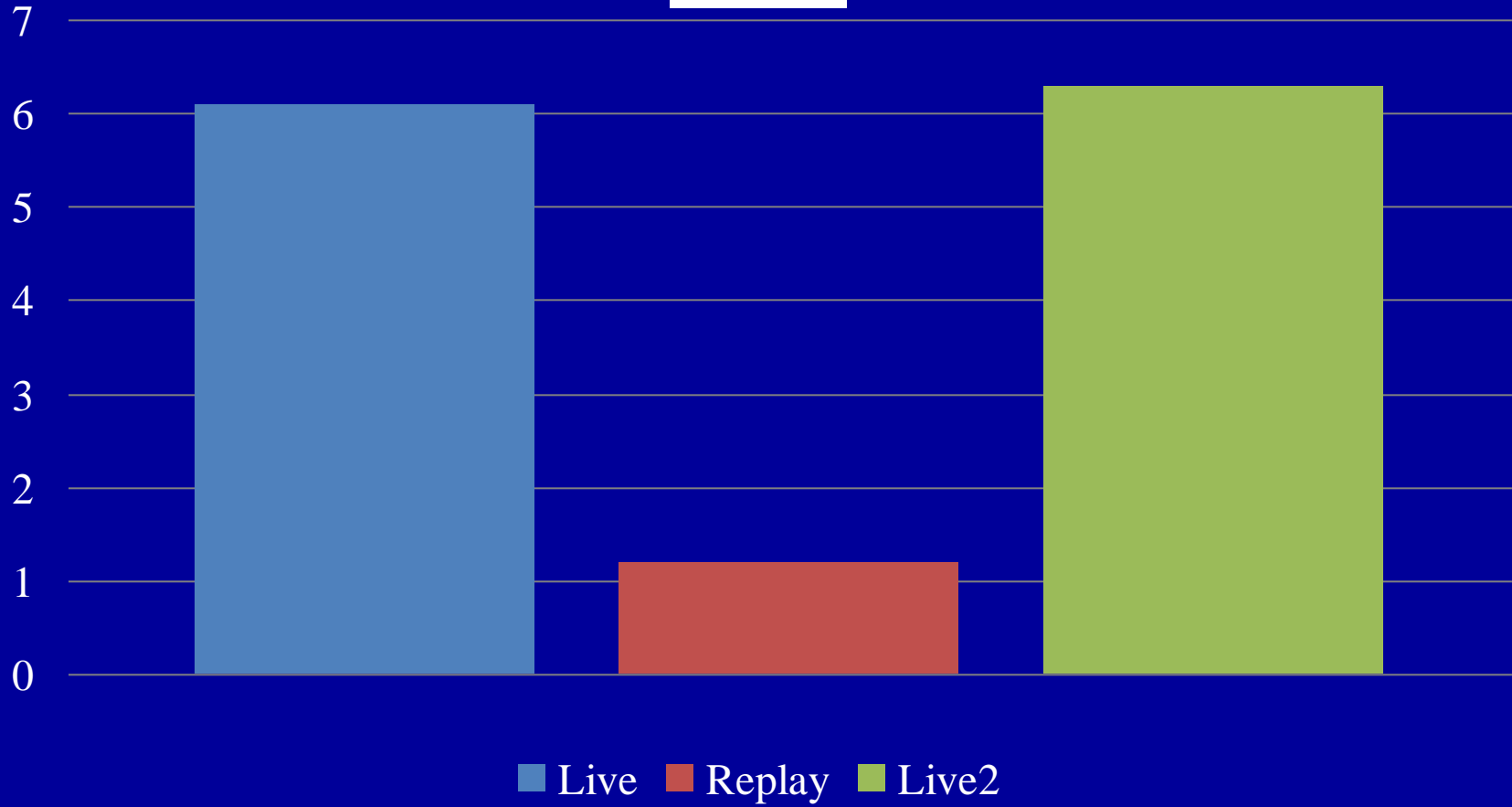
Iris watches her mother who is *not* contingently responsive to her behaviour



Gaze to Mother



Smiling



How do mother-child interactions affect cognitive development?

- Modulation of input to sustain attention (*Kaplan et al, 1999*),
and ‘scaffolding’ (*Vygotsky; Bruner*)

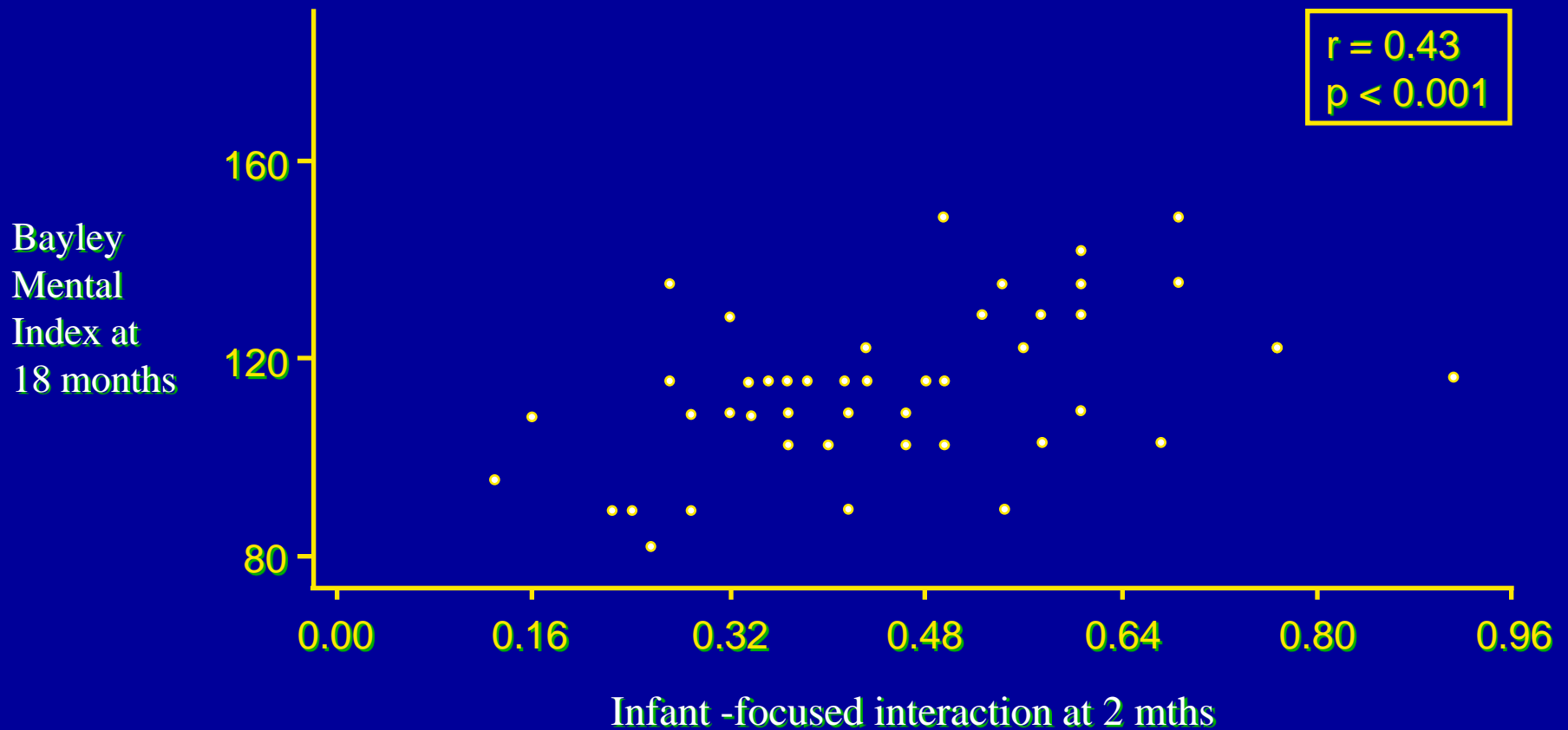
16 Picture slides to follow

Book sharing

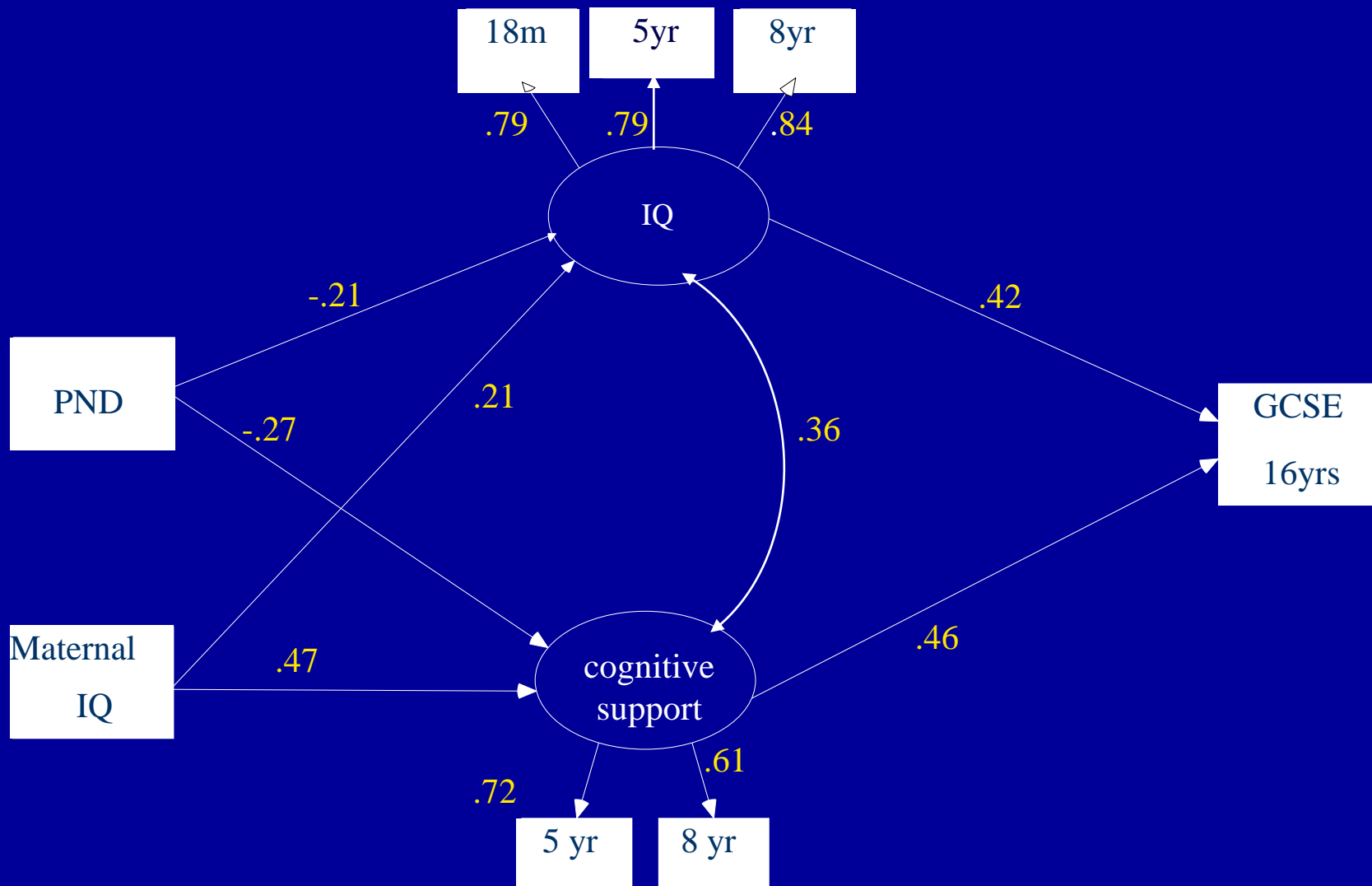
- Drawings simple, no redundant features
- Prototypical elements shown at basic category level
- Contrast between focus and background disambiguates
- Attending for extended periods to single picture, seeing different depictions of same referent, advantageous over 'real world' observations, where events fleeting, complex
- Parents make book-sharing a 'language acquisition device'
- Around 3/4 of all 'labelling' to 1 year-olds occurs in book sharing
- Frequency of book sharing predicts child literacy and language, independent of SES.
- Quality important - 'dialogic reading'-parent adjusts to developmental level, draws child in as active participant

7 Picture slides to follow

Effects of PND: Maternal interactions & Bayley Mental Index (Murray et al., 1993)



Effect of PND on boys' GCSEs in Cambridge study (Murray et al., 2010a)



Conclusions regarding cognitive development

PND principally a risk for poor child cognitive development in the context of wider adversity, and particularly where depression is chronic.

Maternal interactions- responsiveness, contingency, attention regulation mediate effects of PND

Postnatal depression effects on behaviour dysregulation (e.g., conduct problems): maternal reports

a) Indirect association

Ghodsian et al, 1984	current & 14 m depression	42 m
Caplan et al, 1989	current, PND via marital diffs	4 yrs
Brennan et al, 2000	chronicity/severity	5 yrs
Hay et al, 2003	PND only if also later	11 yrs

Postnatal depression effects on behaviour regulation: maternal reports

- **b) *Direct* association**

- Wrate et al, 1985 3 yrs
- Murray et al, 1999 5 yrs
- Dawson et al, 2003 3 ½ yrs

Postnatal depression

Teacher reports

Alpern & Lyons-Ruth, 1993	current externalising PND internalising	5 yrs
Essex et al, 2001: 2003	current externalising PND internalising co-morbid externalising	6 yrs
Sinclair & Murray, 1998	current externalising PND boys externalising	5 yrs
Wright et al., 2000	3-30m dep., aggression	5-8 yrs

Postnatal depression: direct observations

- Murray et al, 1999 low quality play, low peer responsiveness
- Hipwell, 2005 peer aggression (via marital conflict)
- Maughan et al., 2007 low self-competence

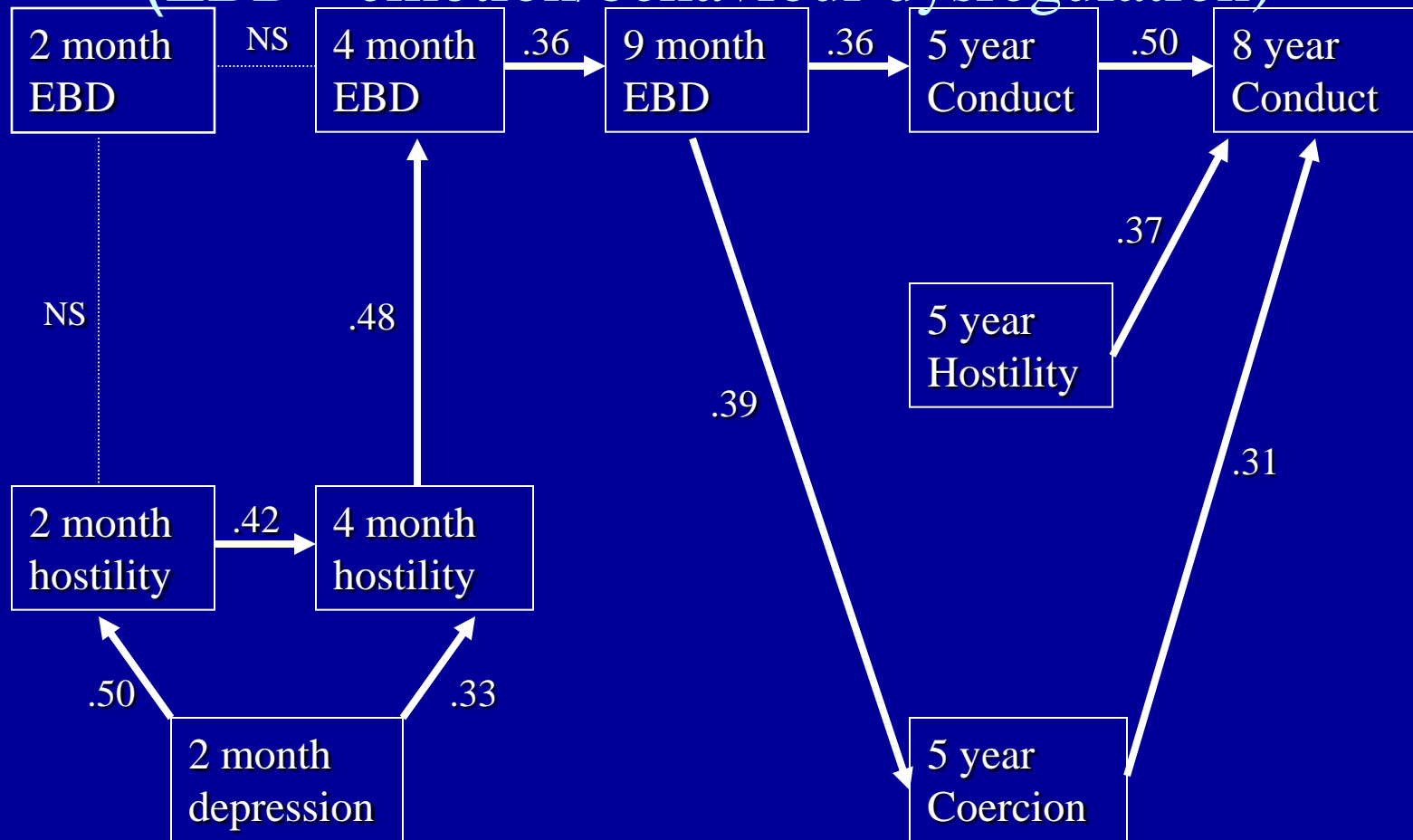
How do mother-child interactions affect child emotion-behaviour regulation?

1. Poor reparation of breakdown & support for self regulation
 - Tronick & Gianino, 1986
 - Jameson et al, 1997
 - Jaffe et al, 2001
2. Hostility & coercion
 - Murray et al, 1996
 - Morrell & Murray, 2002
 - Maughan et al., 2007

52 Picture slides to follow

Infant and parenting predictors of conduct disorder

(EBD= emotion/behaviour dysregulation)



Conclusions regarding behaviour dysregulation

PND principally a risk for poor child externalising problems in the context of wider adversity, and particularly where depression is chronic.

Maternal interactions- hostility, poor emotional regulation, mediate effects of PND

Adolescent depression: Intergenerational transmission evidence

- Consistent reports of offspring of parents with depression being at substantially increased risk for depression themselves:
 - e.g.,
 - Leib et al., 2002
 - Lewinsohn et al., 2005
 - Weissman et al., 2006
 - Timko et al., 2008
- However, little prospective longitudinal data concerning development of disorder through childhood.

PND and Adolescent depression

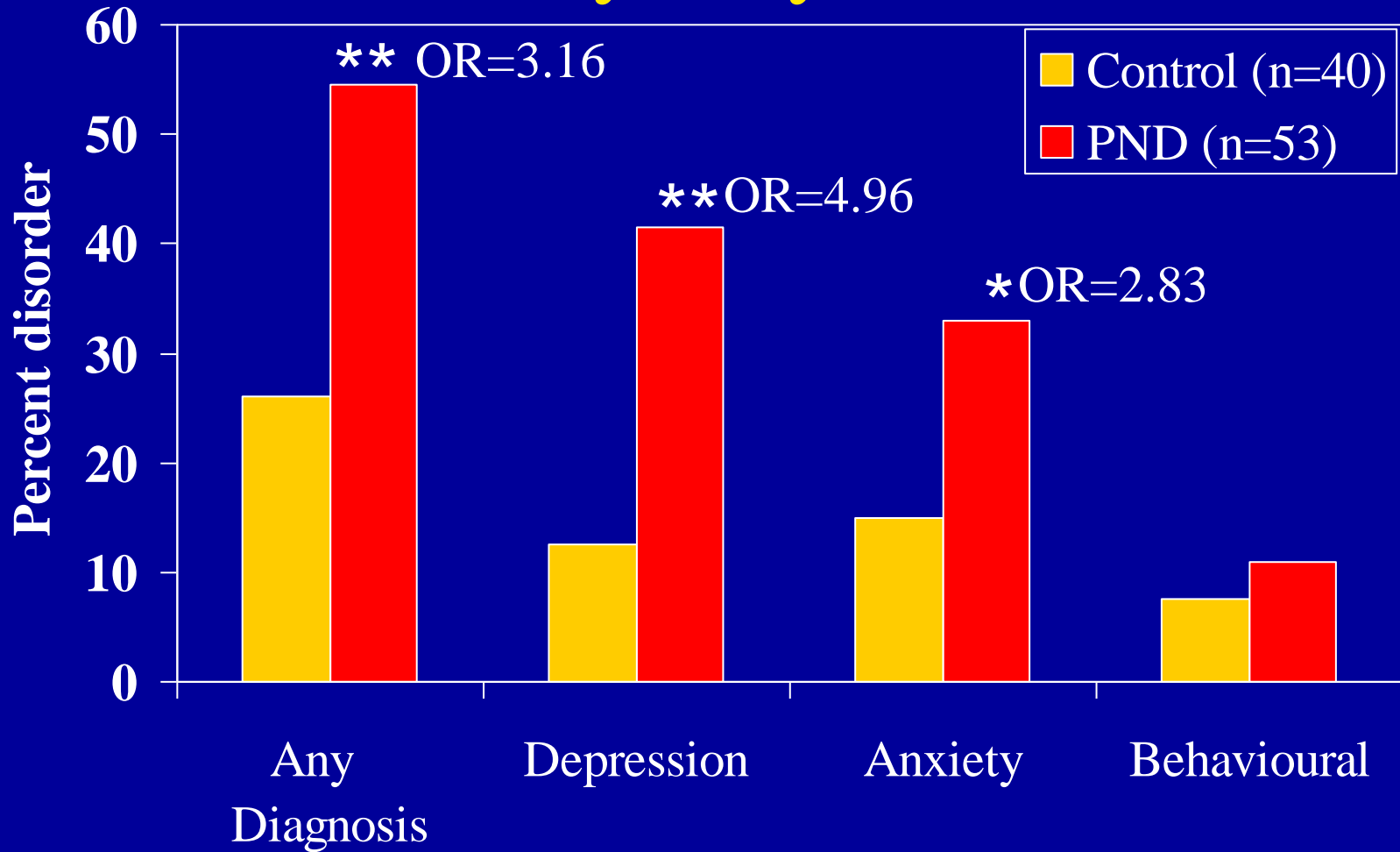
- Hammen and Brennan, 2003
- Hay et al., 2010
- Murray et al., 2010
- All find increased adolescent depression with PND
- In Hammen and Brennan PND sufficient, tho' not necessary, to raise risk
- In Hay et al. PND effect mediated by chronic depression

Psychiatric Outcome: the Cambridge study

Relatively detailed information about the occurrence and timing of mother and child psychopathology is available.

- Diagnostic interviews conducted at 8-yr, 13-yr and 16-yr assessments.
- K-SADS used to assess child psychiatric status.
- Diagnostic interviews carried out with mothers using the SCID at all assessments.

Cambridge study: Lifetime diagnoses by 16-yrs



How might the early mother-child relationship affect development of depression?

1. Emotional contagion Field, 1984,1988
2. Effects on HPA axis Halligan et al. 2004; 2007;
Murray et al. 2010c
3. Insecure attachment and low
resilience Martins & Gaffan, 2000
Sroufe et al., 2005
Murray et al., 2010

How might the early mother-child relationship
affect development of depression?

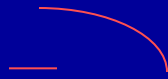
Emotional contagion via maternal speech quality

Maternal Speech to infant: Intonation categories

- Simple fall



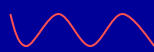
- Jump fall



- Slope fall



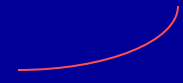
- Undulating fall



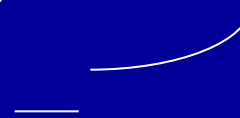
- level



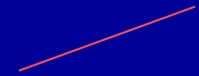
- Simple rise



- Jump rise



- Slope rise

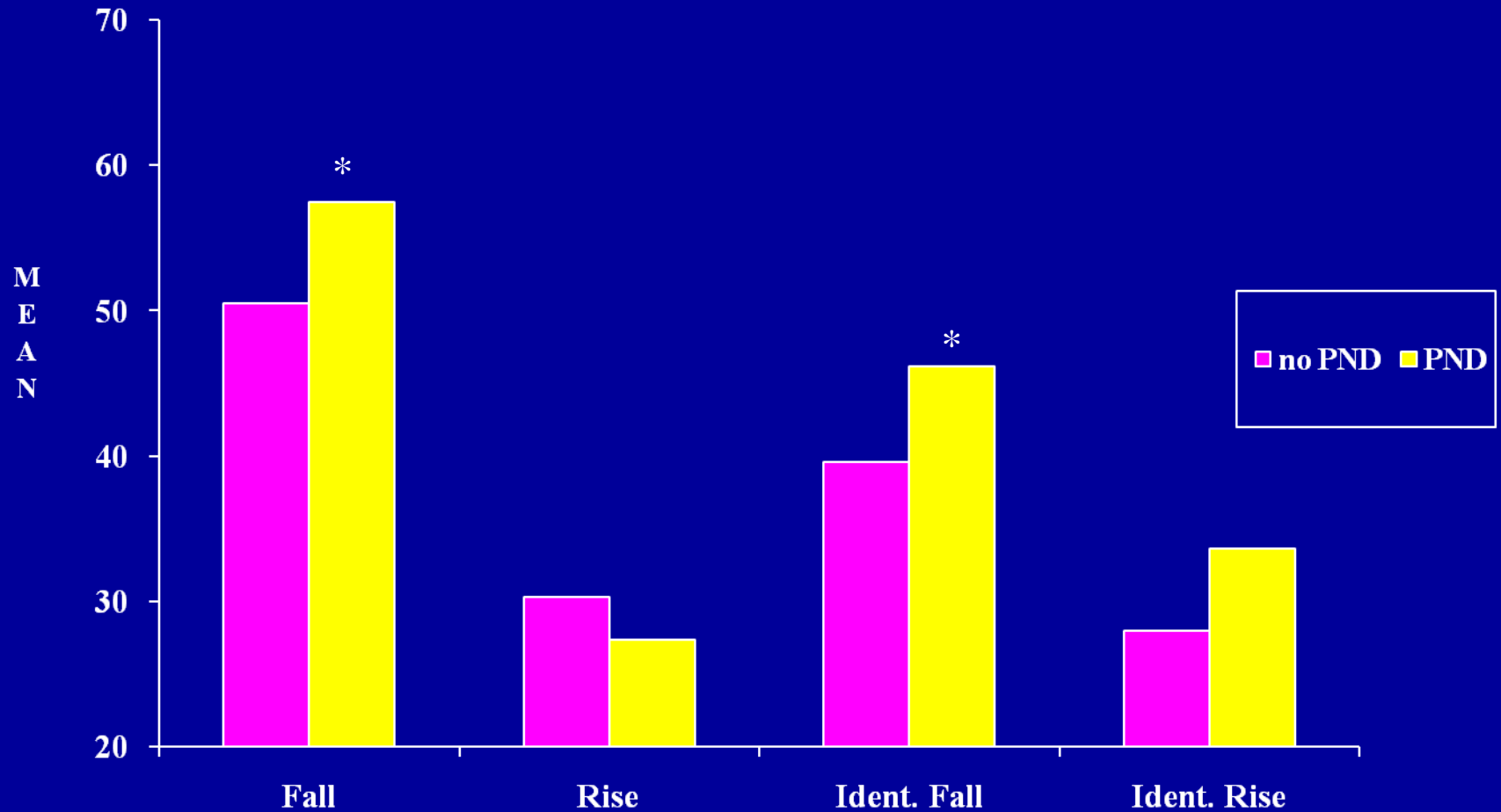


- Undulating rise

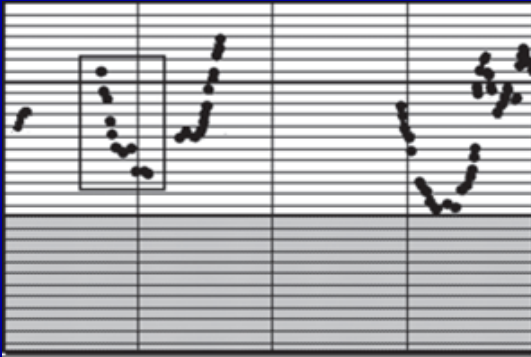


PND and maternal speech intonation 2 m

(Murray et al., 2010b)



Infant Directed Speech 2m



Non-depressed Dyad

Rhythmic

Variability in pitch



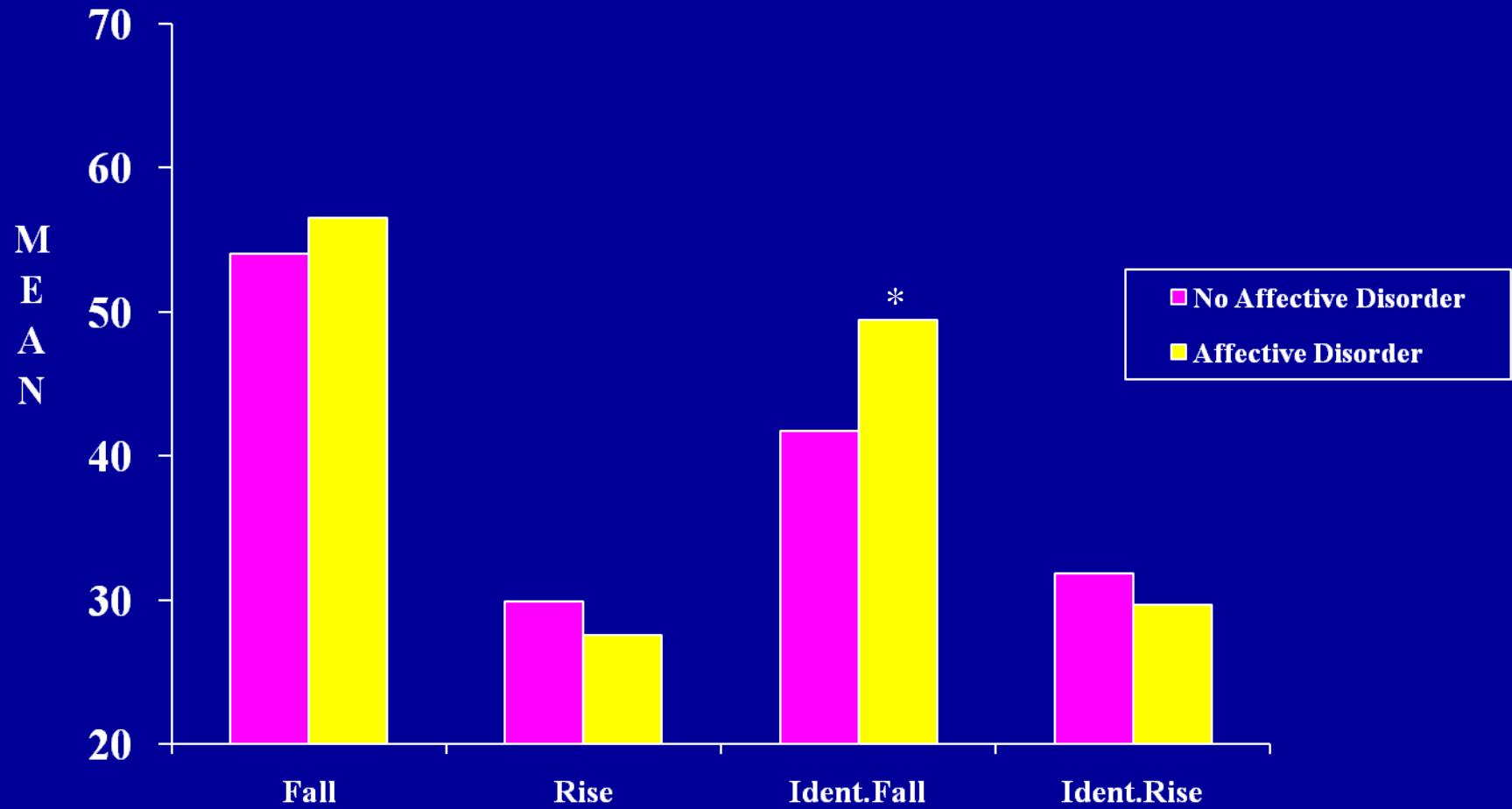
Depressed Dyad

Non-rhythmic

Falling pitch contours

Narrow pitch range

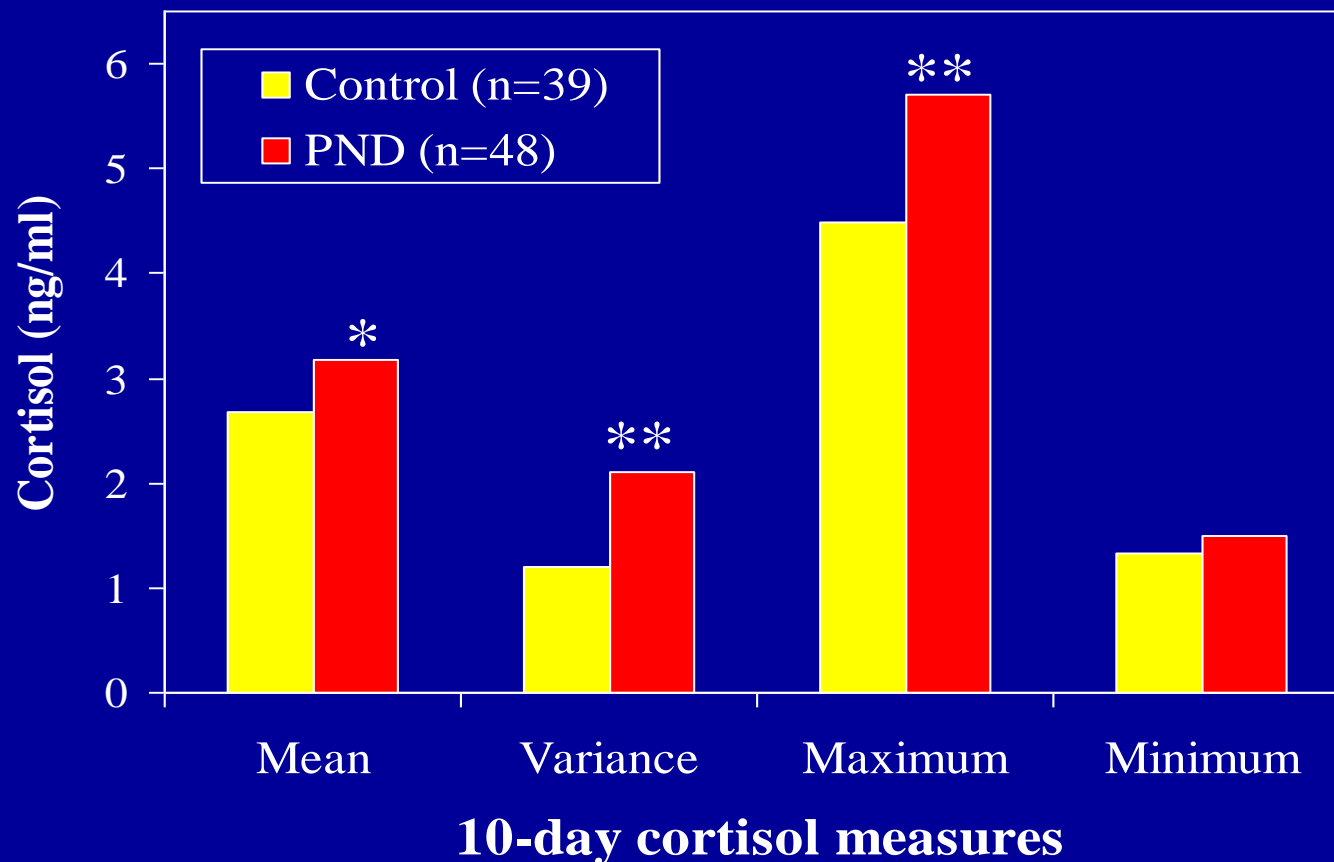
Intonation and Child Affective Disorder 13 yrs



How might the early mother-child relationship
affect development of depression?

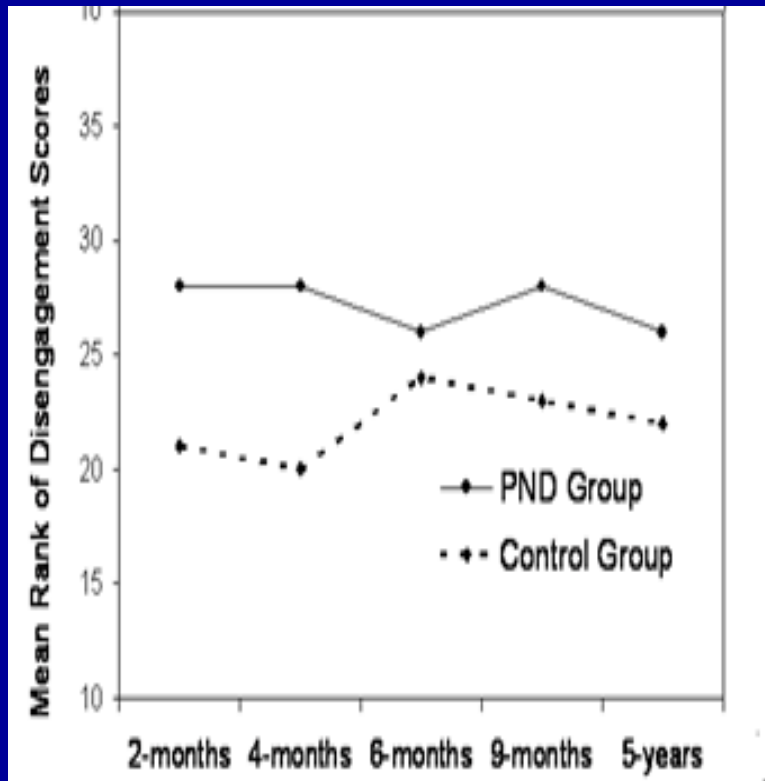
Via HPA axis (Halligan et al, 2004; 2007; Murray et
al, 2010c)

10-day 08:00 cortisol at 13-years in relation to PND



Effects retained controlling for pubertal status, BMI, current depressive symptoms, negative life events.

Mother-infant interactions in 1st 9 months and at 5 years in relation to 13 yr. a.m. cortisol



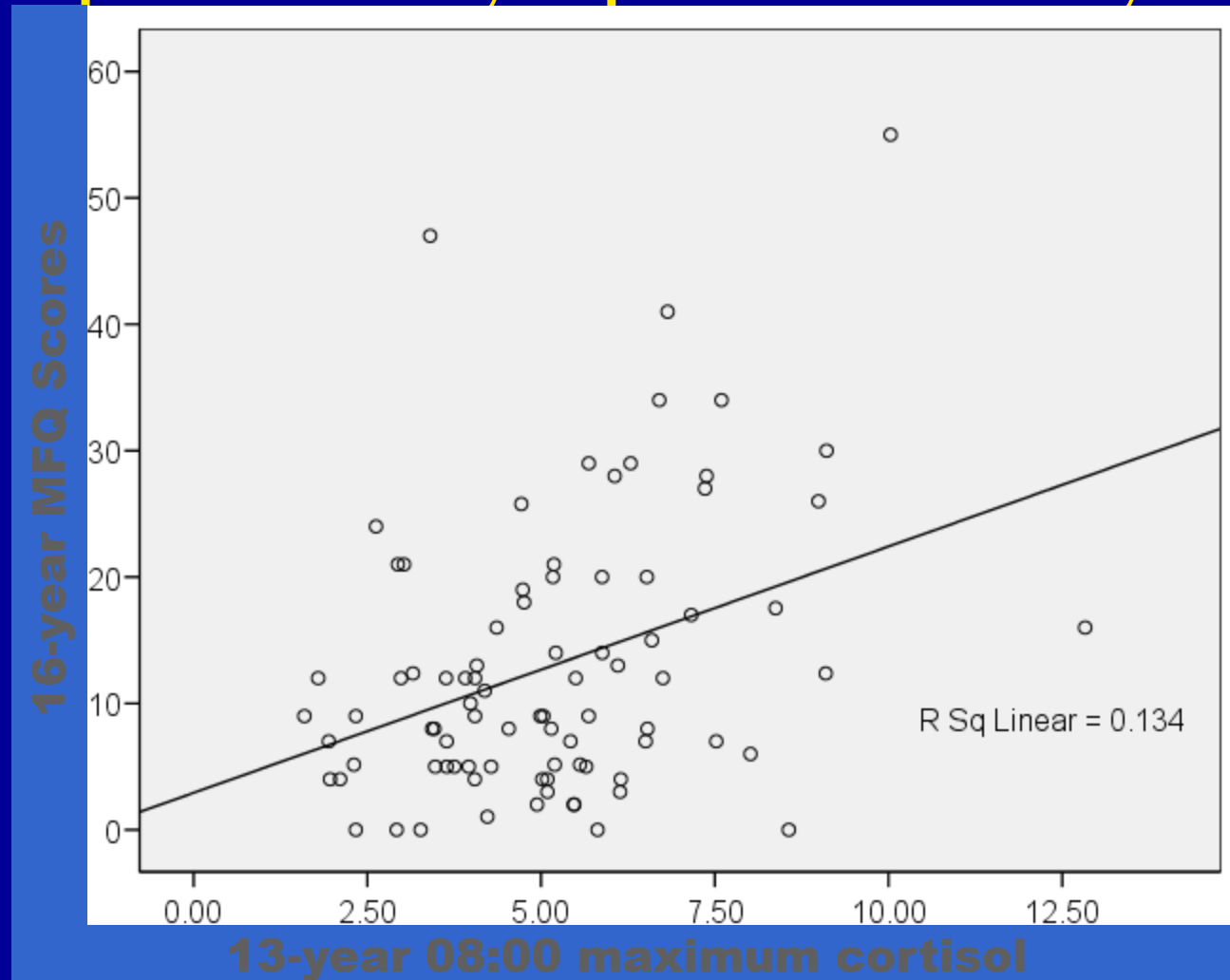
PND disengagement

$r = .40, p = .006$

5 yr disengagement

$r = <.05, ns$

13-year morning cortisol and depressive symptoms at 16-years



How might the early mother-child relationship
affect development of depression?

Via insecure attachment and poor resilience

Bowlby's theory of attachment

- Concerns propensity to make close emotional bonds
- Need for protection a prominent feature early in development
- Security promotes independence

Attachment quality

- Secure: can rely on parent for support when distressed
- Insecure avoidant: minimize expression of distress, avoid close contact
- Insecure ambivalent: maximize expression of distress at separation, mixed with anger
- Disorganised: no clear strategy, confused, irrelevant, freezing

Bowlby's view of mental health implications

- Avoidant
 - Deny needs
 - Attempt to live without others' love and support
 - Sense of self as not worthy of love
 - Low expectations of others
- Ambivalent
 - Pervasive anxiety, especially re. separation/abandonment
 - Limited exploration of world
 - Coping capacities not developed

Evidence to date: Minnesota longitudinal study of mental health outcomes

- Avoidant/disorganized – predicts more global pathology (Sroufe, 2005)
- Ambivalent – predicts anxiety diagnoses (Warren, 1997)
- Avoidant – predicts externalizing, early onset antisocial (Aquilar, 2000; Sroufe, 2005)
- Avoidant/ambivalent – predicts depression (Sroufe, 2005)
- Disorganised – predicts dissociation (Carlson, 1998)
other disorders (Liotti, 2004; 2008)
- NB not strong effects, adversity adds

Effects of depression on infant attachment

Systematic associations shown between PND and insecure attachment

Meta analyses-

Martins and Gaffan, 2000

Atkinson et al., 2000

Plus

Campbell et al., 2004 (NICHD sample)

Examples of attachment behaviours

- Separation anxiety
- Stranger Fear
- Ainsworth's Strange Situation Procedure

23 Picture slides to follow

Mother-Child Attachment Relationship and PND

Meta-analyses: Martins & Gaffan, 2000
Atkinson et al., 2000

- increased rate of insecurity in depressed mothers' infants

Campbell, et al., 2004 NICHD sample

- chronic depression made insecure attachment more likely
- maternal insensitivity accounted for insecurity

26 Picture slides to follow

Bowlby's view of mental health implications of attachment for ego resiliency

- Avoidant
 - Deny needs
 - Attempt to live without others' love and support
 - Sense of self as not worthy of love
 - Low expectations of others
- Ambivalent
 - Pervasive anxiety, especially re. separation/abandonment
 - Limited exploration of world
 - Coping capacities not developed

Ego resiliency

Thus, the insecure child may:-

- lack capacity to cope with threat

- have rigid, or limited coping strategies

- be overwhelmed with sense of loss/anxiety

- have low self-worth

(Erikson, 1985)

Video card game

Predicted pathway

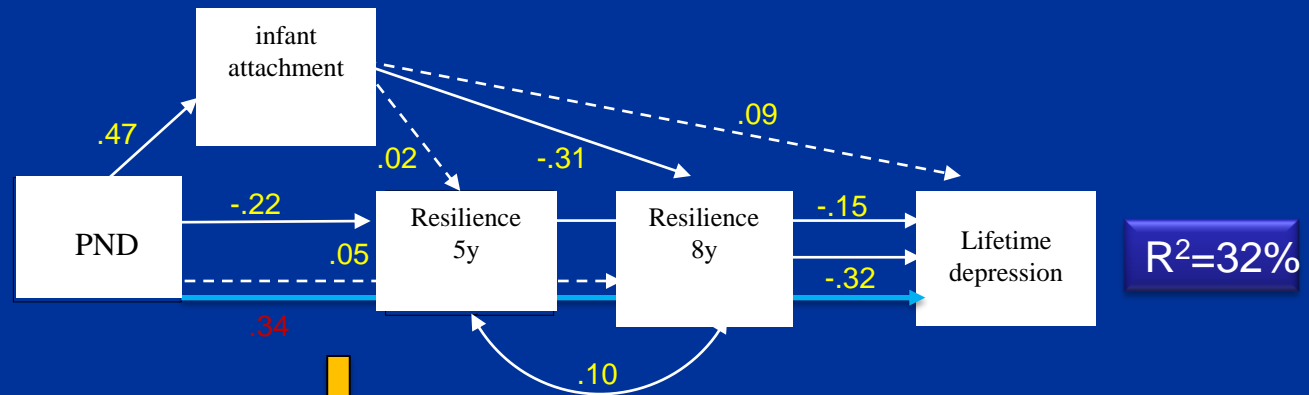
PND → insecurity → low ego resiliency → depression

Developmental trajectory to depression

Insecure attachment at 18 months

Low ego resiliency, measured in challenge task at 5 and 9 years

Early vulnerability route whereby PND affects offspring emotional development



Note: The original path PND-lifetime depression with no mediators was .42, explained variance $R^2=18\%$.

Model fit:

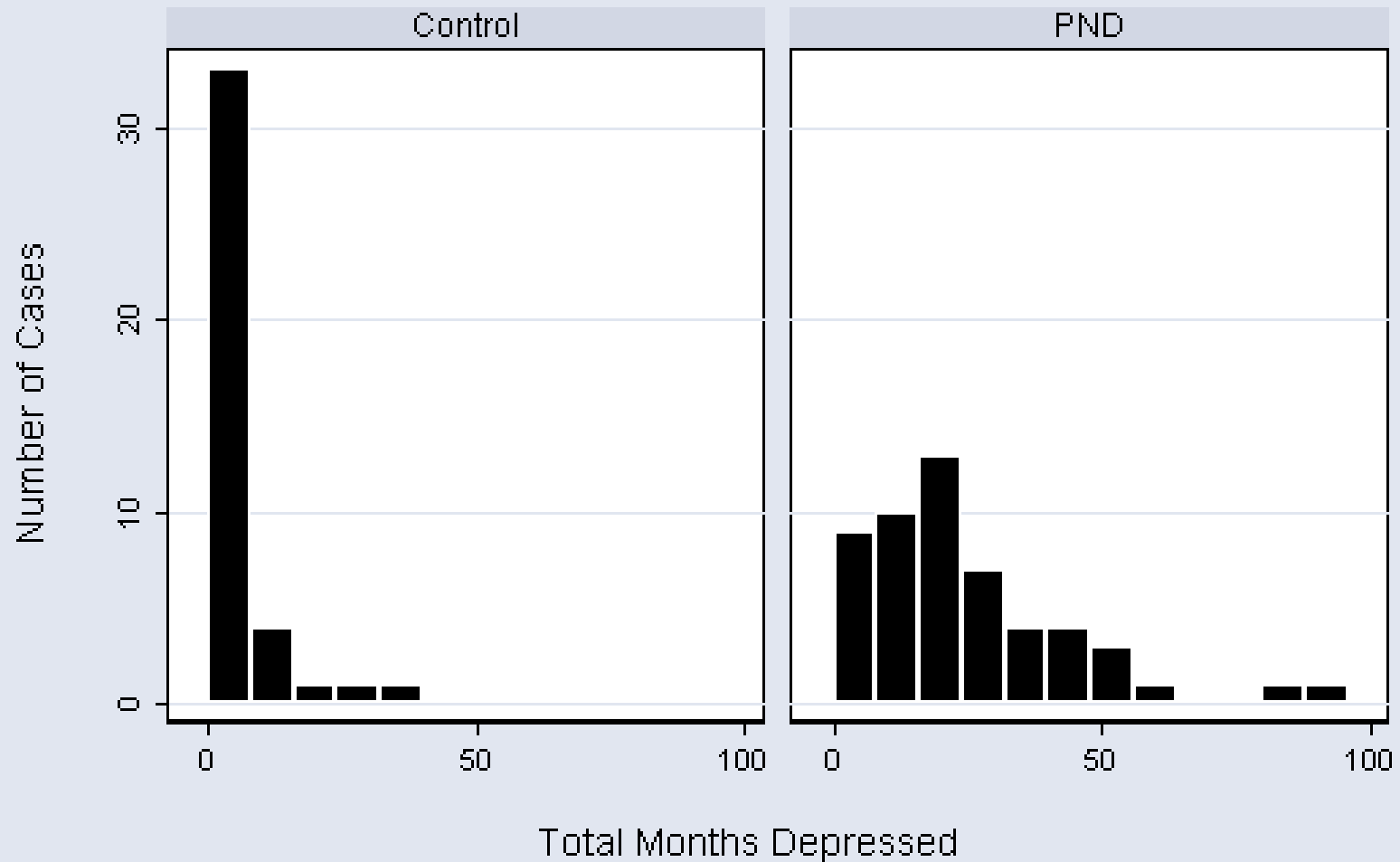
$\chi^2(3)= 0.43, p=0.93$; CFI=1.0; TLI=1.24; RMSEA=0.00

Role of chronic difficulties

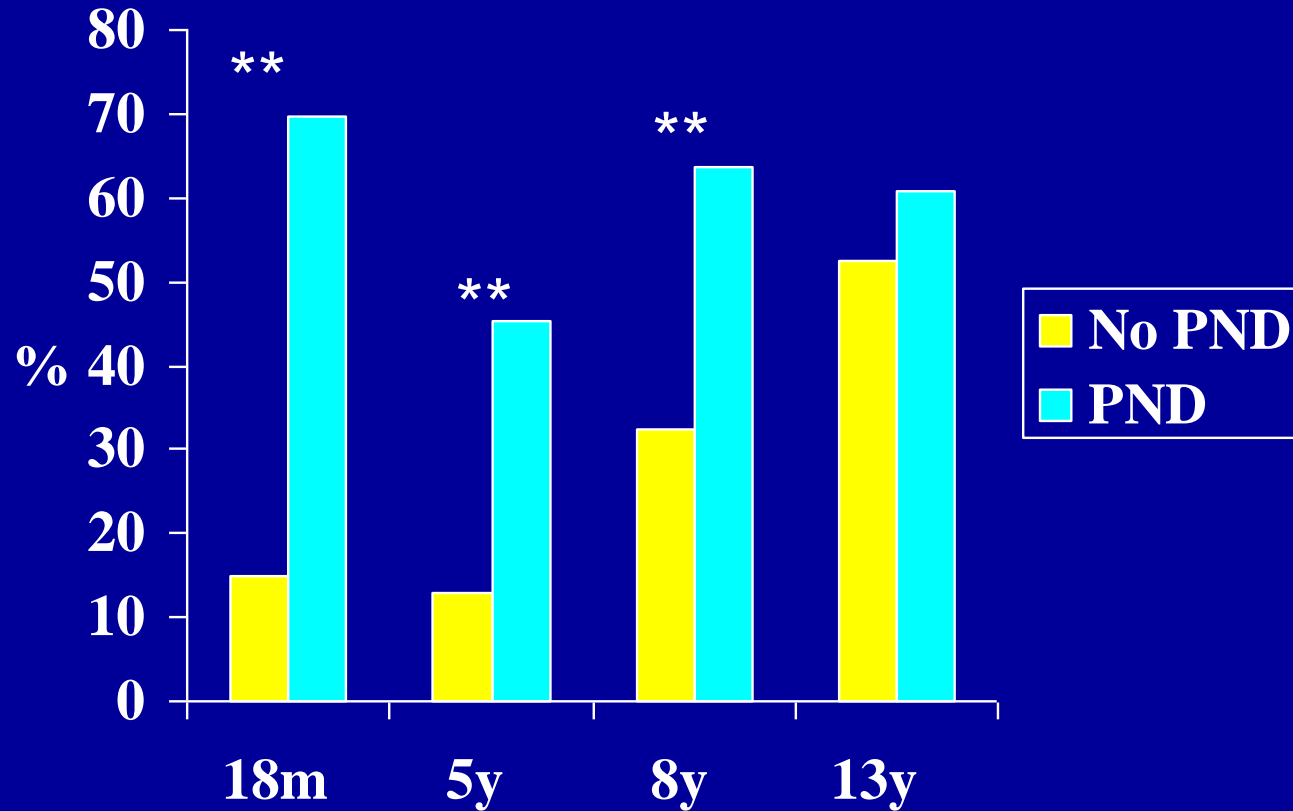
- Mother-child relationship
 - Observations at 5 and 8yrs
- Maternal depression
 - Assessed at each time point, with month-by-month recording of offsets and onsets of disorder to give chronicity
- Marital conflict
 - Assessed at each time point by interview/questionnaire

Chronicity of maternal depression

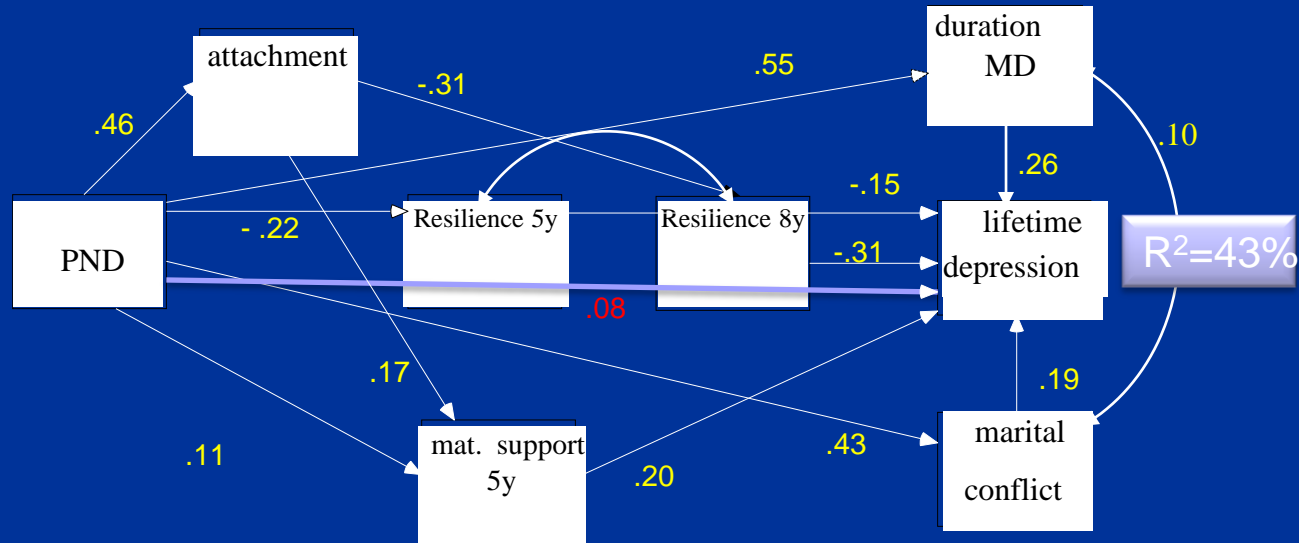
Women in the PND group experienced further depression outside the postnatal period



Marital conflict: Relation to PND



Child vulnerability & chronic adversity routes



Subsequent maternal depression ($Z=2.61, p=.008$) and marital conflict ($Z=2.23, p=.03$) were confirmed as partial mediators of the effects of PND on offspring depression, but no such effect for poor maternal support ($Z=1.28, ns$).

Model fit:
 $[\chi^2(9)= 12.66, p=0.18; CFI=0.92; TLI=0.84; RMSEA=0.060$

Summary

- Child depression up to 16 yrs predicted by PND, insecure attachment, and poor resiliency, especially at 8 yrs.
- Subsequent poor maternal emotional support adds to risk.
- Marital conflict, and maternal chronic depression also add to risk, but do not account for PND effect.

Overall conclusions

- PND associated with range of disturbances in mother-infant relationship
- Offspring outcome affected in diverse domains-cognitive, behavioural, affective.
- Each outcome might have specific developmental trajectory

Specificity of effects has implications for treatment