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## BACKGROUND AND PURPOSE

- Previous studies have shown that infants of depressed mothers show atypical patterns of frontal brain activity during play interaction: such infants showed increased right hemisphere (RH) activity and/or decreased left hemisphere (LH) activity, suggesting effects on emotional regulation<sup>1,2</sup>
- Outside of this population, little is known about typical EEG patterns of infants during various interactive events, especially those involving infant-directed (ID) speech
- The speech of clinically depressed mothers is often attenuated in acoustic form<sup>3</sup> and such speech does not appear to elicit typical levels of attention from infants<sup>4</sup>; However, little is known about the impact of speech on patterns of cortical activity in infants
- Our purpose was to examine **patterns of cortical activation (EEG) in 8-month-old infants** to Happy vs. Sad Infant-directed videos, and an interactive game between the infant and mother as well as a female stranger

## PARTICIPANTS AND METHODS



- 25 8-mo-olds (12 F and 13 M)
- EEG recorded from 16 scalp locations (average reference) during baseline (BL) and tasks
- Infants sat in high chair and saw Female ID Happy (VH) and Female ID Sad (VS) 30 s

video clips (counterbalanced)

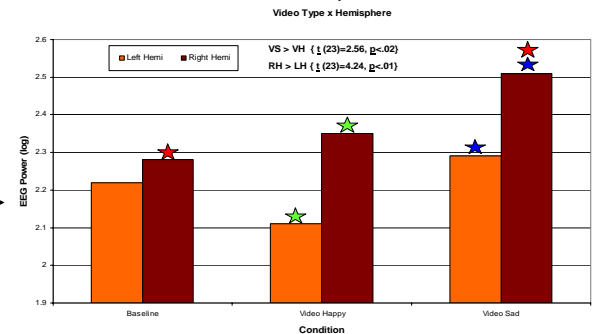
- Infants then sat across from mother (PM) and then stranger (PS) and played a 1-minute game of peek-a-boo (counterbalanced)
- EEG scored for artifact (eye and gross motor movement) and power values normalized using natural log

## EEG ANALYSIS

- EEG data were divided into 3 10-sec epochs; only first 10 s are reported here
- All power values are from 6 – 9 Hz bandwidth, with the assumption that higher power values reflect greater cortical activation during event processing<sup>5</sup>
- Only F3 and F4 data were analyzed for this presentation

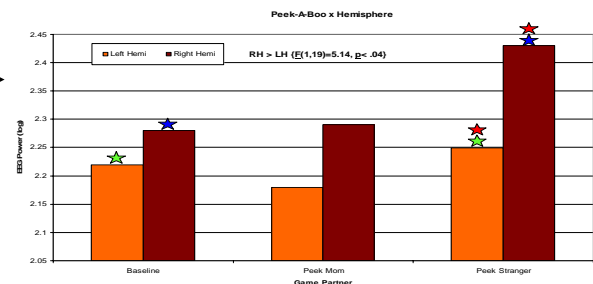
## RESULTS FOR VIDEO TRIALS

- Significant main effect of **HEMISPHERE**  $F(1,23)=23.95, p<.001$  (**RIGHT > LEFT**)
- Significant main effect of **CONDITION**  $F(1,23)=6.04, p<.03$  (**VS > VH**)
- Non-significant **HEMI X COND** interaction  $F(1,23)=3.30, p<.08$



## RESULTS FOR PEEK-A-BOO TRIALS

- Significant main effect of **HEMISPHERE**
- $F(1, 19)=5.14, p<.04$  (**RIGHT > LEFT**)



## SUMMARY POINTS

- Generally, infants showed greater EEG power in RH (compared to BL) to VS and PS; this effect was not seen for VH or PM; Infants did show greater RH (compared to LH) activation for VS, PS, and VH
- Generally, infants showed less EEG power in LH to VH and PM when compared to BL (although n.s.)
- Both the **sad video** and the **stranger peek-a-boo** events produced substantial increases in RH activation, either because:
  - VS and PS produced more negative emotions
  - VS and PS produced more attention (alerting)

## REFERENCES

- <sup>1</sup>Dawson, G. et al. (1992).
- <sup>2</sup>Dawson, G. et al. (1999). Child Development, 70, 1058-1066.
- <sup>3</sup>Bettes
- <sup>4</sup>Kaplan
- <sup>5</sup>Bell. (2001). Infancy, 2, 311-330; Bell (2002). Psychophysiology, 39.