COMMUNICATION PATTERNS AND FRONTAL ASYMMETRY DURING DISCUSSIONS OF DISAGREEMENTS IN ROMANTIC PARTNERS

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Introduction/Synopsis

- Electroencephalographic (EEG) alpha asymmetry over the prefrontal cortex has been identified as a trait and state indicator of approach and withdrawal behaviors (Coan & Allen, 2004):
  - Relatively greater left prefrontal activity corresponds to approach behaviors and relatively less left prefrontal activity corresponds to withdrawal behaviors.
- However, no study to date employed simultaneous examination of the frontal EEG asymmetry in individuals during social interactions.
- A communication pattern associated with lower relationship satisfaction is the demand-withdraw cycle (DW; Christensen & Heavey, 1990), which has been defined as the pattern of interaction in which one partner engages in demanding behaviors through criticism or nagging and demands change from their partner, while their partner engages in withdrawing behavior by avoiding confrontation and disengaging from the interaction.
- In the present study, DW communication and prefrontal asymmetry were examined in 10 college couples while they discussed disagreements in relationship.
- Results indicated that EEG asymmetry was differentially related to patterns of demanding and withdrawing communication in romantic partners during discussions of disagreement.

Method

Participants

- 10 heterosexual college couples in romantic relationship for at least 2 months
- Exclusion criteria: left-handed, epilepsy, loss of consciousness for greater than 10 minutes, head trauma, medications or street drugs with psychotropic effects

Procedure

- Partners discussed an area of disagreement in relationship that each of them identified (2 6-minute segments), in counterbalanced order, while EEG was recorded.
- After each discussion, partners filled out a measure of Demand-Withdraw communication (DW), indicating how much they withdrew from discussion while their partner demanded change.

EEG data recording and reduction

- Two 64-channel NeuroScan Synamps2 (Charlotte, NC)
- Impedances < 10 Kohms
- Digitized continuously at 1000 Hz, amplified 2816 times, and filtered with 200Hz low pass filter prior to digitization
- An online reference site immediately posterior to Cz
- Data were transformed offline using a current source density (CSD) derivation
- Visual inspection for movement and muscle artifacts
- Data were segmented into one-minute EEG blocks and further epoched into 2.048 sec epochs per block, overlapping by 1.5 seconds.
- Independent component analysis (ICA) for artifact removal (i.e., blinks, eye movements,) using ADJUST (Mognon et al., 2011)
- Power in the 8 - 13 Hz band was extracted.
- Asymmetry score: ln[right] - ln[left]) at F4 and F3 sites

Statistical analysis

- All analyses were done using multilevel modeling in the PROC MIXED routine of SAS 9.3 software

Results

- **Importance of issue being discussed**

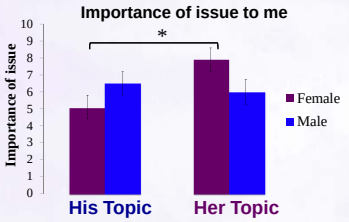

Figure 1. Female partners identified the area of disagreement that they chose to discuss as significantly more important than the one chosen by their male partners.

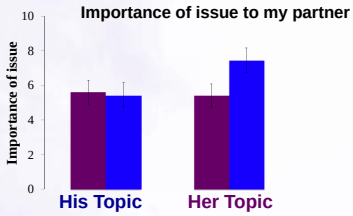

Figure 2. No statistically significant differences emerged between female or male partners' perception of the importance of the chosen topic to their partners.

- **Does prefrontal asymmetry depend on whose topic is being discussed?**

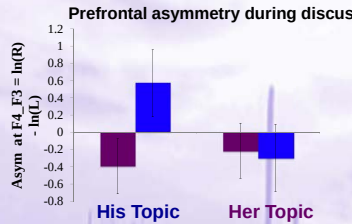

Figure 3. No statistically significant differences in prefrontal EEG asymmetry emerged in males or females during discussion of the topic they chose vs. the topic that their partner chose.

- **Does DW communication depend on whose topic is being discussed?**

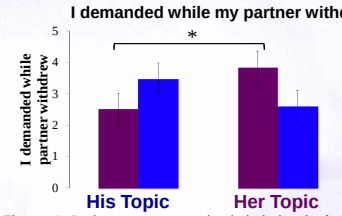

Figure 4. Both partners perceived their level of demand being higher during their own topic compared to the topic chosen by their partner, and in females this difference was statistically significant.

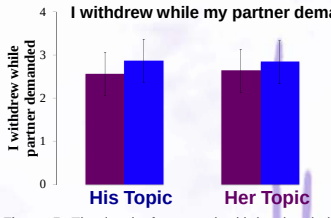

Figure 5. The level of reported withdrawing behavior was not significantly different during own topic compared to partner's topic as identified by both female and male partners.

- **Is prefrontal asymmetry associated with DW?**

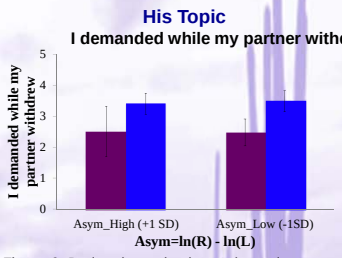

Figure 6. During the topic chosen by male partners, contrary to prediction, no significant differences in EEG asymmetry as related to the level of demanding behaviors emerged in either partner.

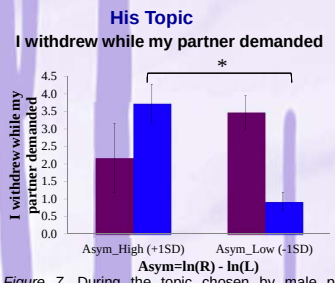

Figure 7. During the topic chosen by male partners, contrary to prediction, lower EEG asymmetry scores (relatively less left/greater right frontal activity) were related to lower levels of withdrawal from discussion.

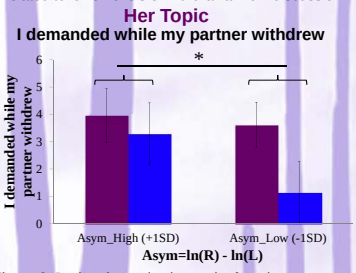

Figure 8. During the topic chosen by female partners, greater relative left frontal activity was associated with a higher level of demanding behavior in both partners.

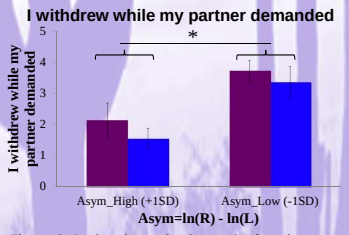

Figure 9. During the topic chosen by female partners, less relative left fontal activity was associated with greater withdrawal from the interaction in both partners.

Discussion

- Using an ecologically valid partner interaction paradigm in couples, EEG asymmetry appears to track the degree of engagement in interactions during discussions of disagreement.
- The effect appeared to be most salient when a discussion constituted a stronger manipulation (rated as more important).
- Analyses of the larger sample from which this subpopulation was drawn is needed to validate these preliminary findings.

References

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- Coan, J. A., & Allen, J. J. B. (2004). Frontal EEG asymmetry as a moderator and mediator of emotion. *Biological Psychology, 67*, 7–49.
- Mognon, A., Jovicich, J., Bruzzone, L., & Buiatti, M. (2011). ADJUST: An automatic EEG artifact detector based on the joint use of spatial and temporal features. *Psychophysiology, 48*, 229-240.

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Handouts available: www.psychofizz.org