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Temperament, Shyness, and Anxiety Disorders: Looking for Links in Childhood

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I. Basic science

- ! Use the phenomenon of temperamental shyness as an example to illustrate three basic questions in personality theory and development

3 Questions

1. Are there early appear behavioral and physiological characteristics that are stable across time and context and predict reactivity and outcome in some children?
2. Are there particular environments (contexts) that interact with these individual characteristics to confer a particular outcome?
3. Are these individual characteristics open to change?

Measuring brain electrical activity (EEG) in a temperamentally shy child and adult



traditional 32 channel 10/20 EEG cap

128 channel dense EEG net

What do we know about its biological correlates?

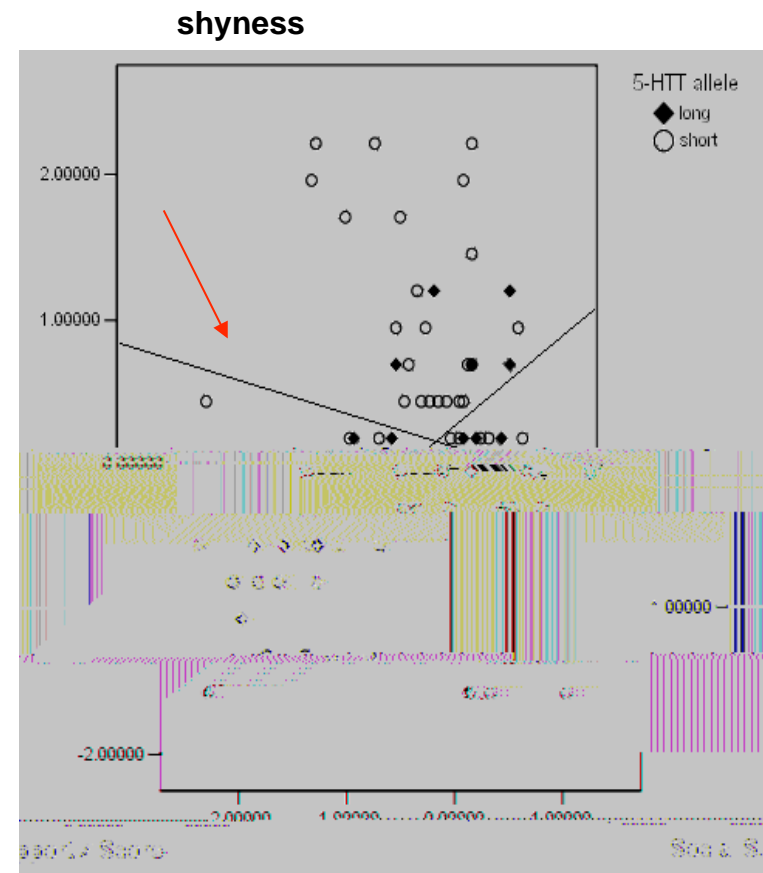
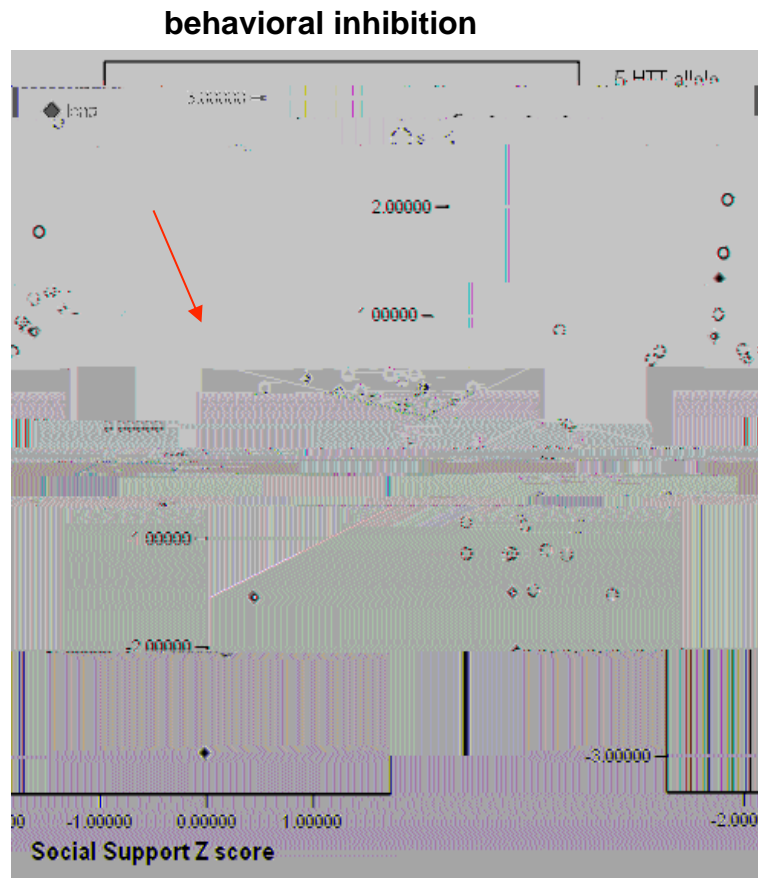
Disparate findings on multiple psychophysiological measures at rest (baseline) and in response to stress across development, including:

Individual X context interactions

Question 2:

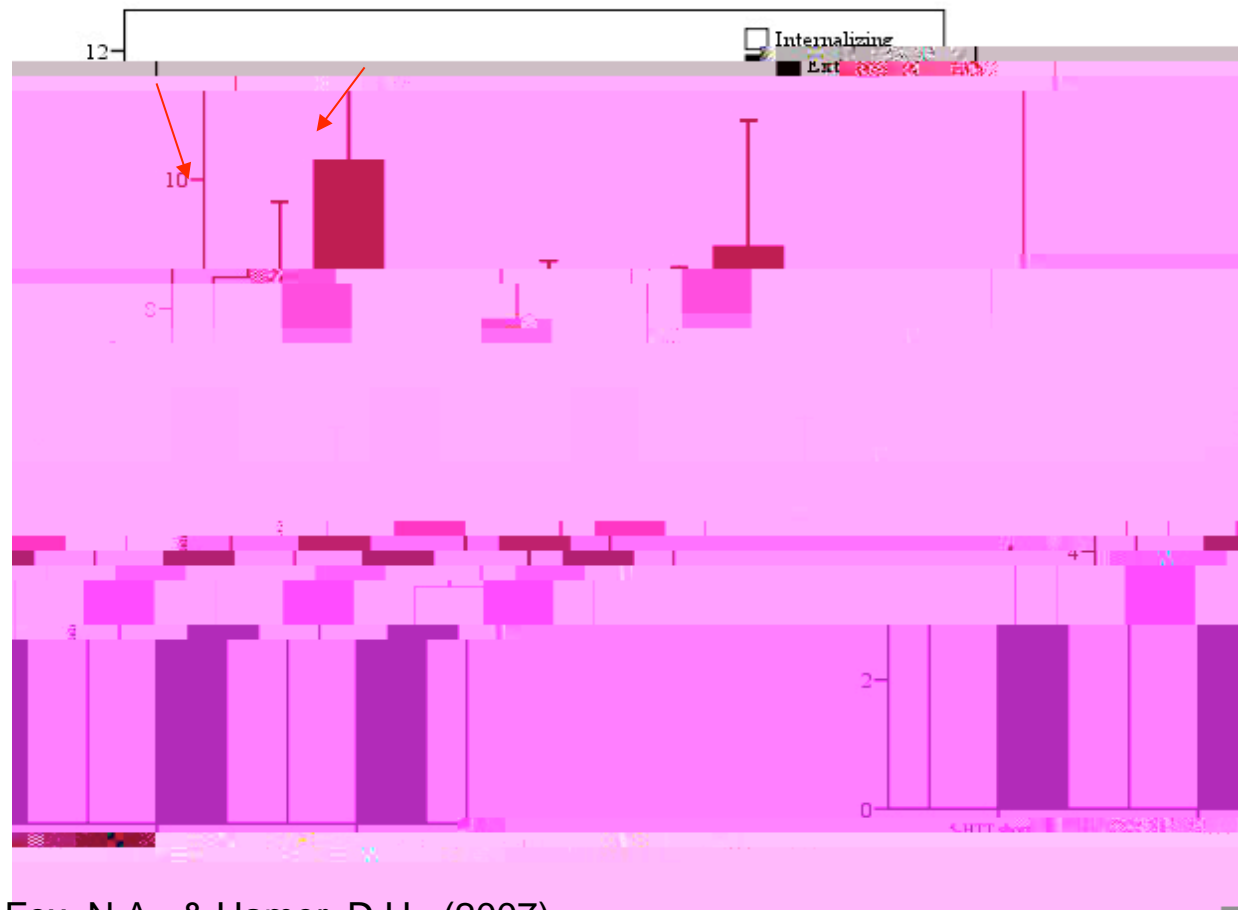
Are there particular environments (contexts) that interact with these individual characteristics to confer problem outcome or protection?

Evidence for a gene-environment interaction in predicting behavioural inhibition and shyness in middle childhood



Fox, N.A., Nicols, K., Henderson, H., Rubin, K.H., Schmidt, L.A., Hamer, D., Ernst, M., & Pine D.S. (2005). , 921-926.

Evidence for a gene-gene interaction in predicting children's behaviour problems in middle childhood



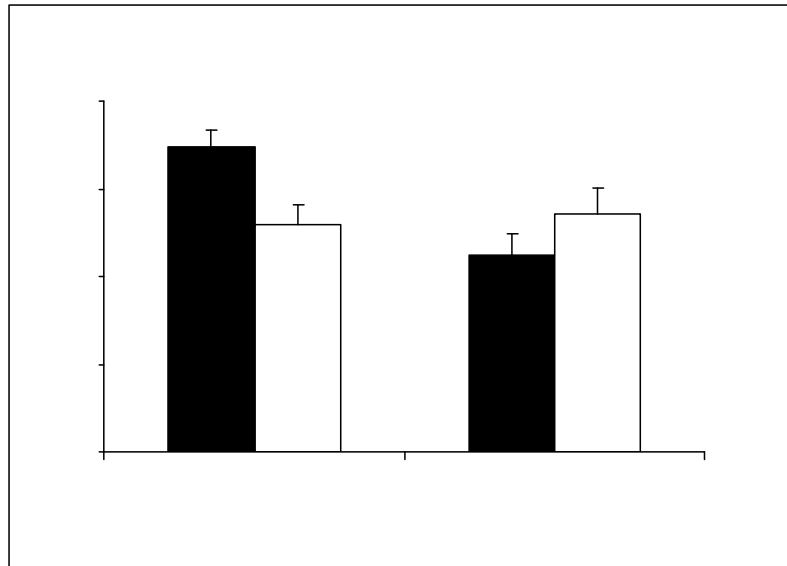
Schmidt, L.A., Fox, N.A., & Hamer, D.H. (2007).

, , 1105-1116.

Gene-"endo"environmental interactions

- ! Schmidt, L.A., Fox, N.A., Perez-Edgar, K., & Hamer, D.H. (2009). Linking gene, brain, and behavior: DRD4, frontal asymmetry, and temperament. *Psychological Science, 20, 831-837.*
- ! Risk alleles provide differential sensitivity
- ! E.g., DRD4 long (risk allele) in the presence of...
 - ! Exogenous environments (good parenting) "for better"
 - ! Exogenous environments (bad parenting) "for worse"

Evidence for a gene-endoenvironment interaction in predicting children's behaviour



Malleability and change

Question 3:

Are these individual characteristics open to change?

Resting brain activity and temperamental shyness

Temperamentally shy adults exhibit patterns of resting frontal EEG activity that are similar to temperamentally shy children: greater relative right frontal EEG activity

Schmidt, L.A. (1999). Frontal brain electrical activity in shyness *and* sociability. *Psychological Science*, 10, 316-320.

Psychotherapy and the brain

Miskovic, V., Moscovitch, D.A., Santesso, D.L., McCabe, R.E.,
Antony, M.M., & Schmidt, L.A. (2010). Changes in
EEG cross-frequency coupling during cognitive
behavioral therapy for social anxiety disorder.
Psychological Science, in press.

Study overview

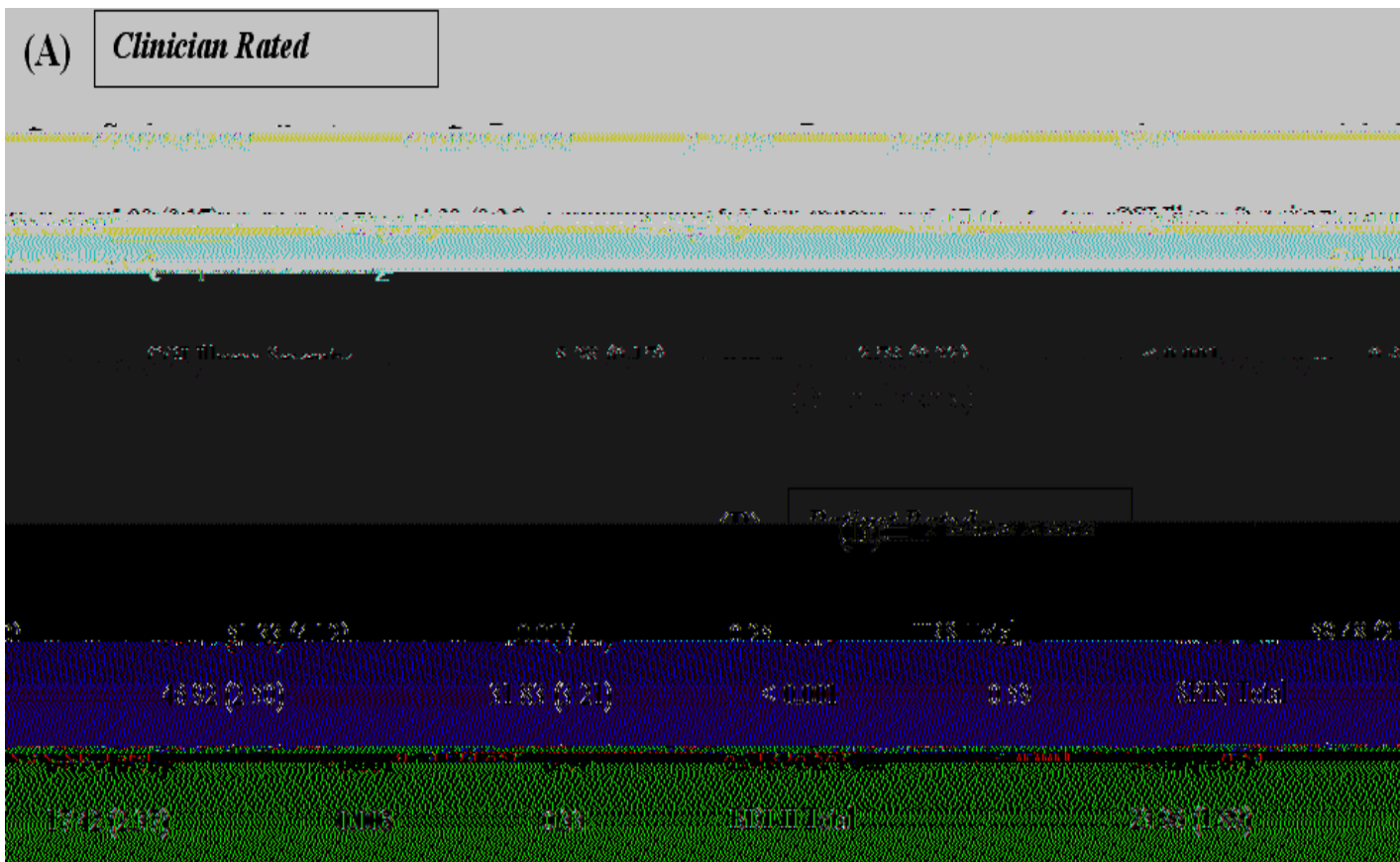
Participants

- ! Individuals ($n = 25$; 12 females, 13 males, M age = 35.9 years) with principal confirmed diagnosis of Social Anxiety Disorder underwent 12 sessions of standardized, therapist-administered group CBT

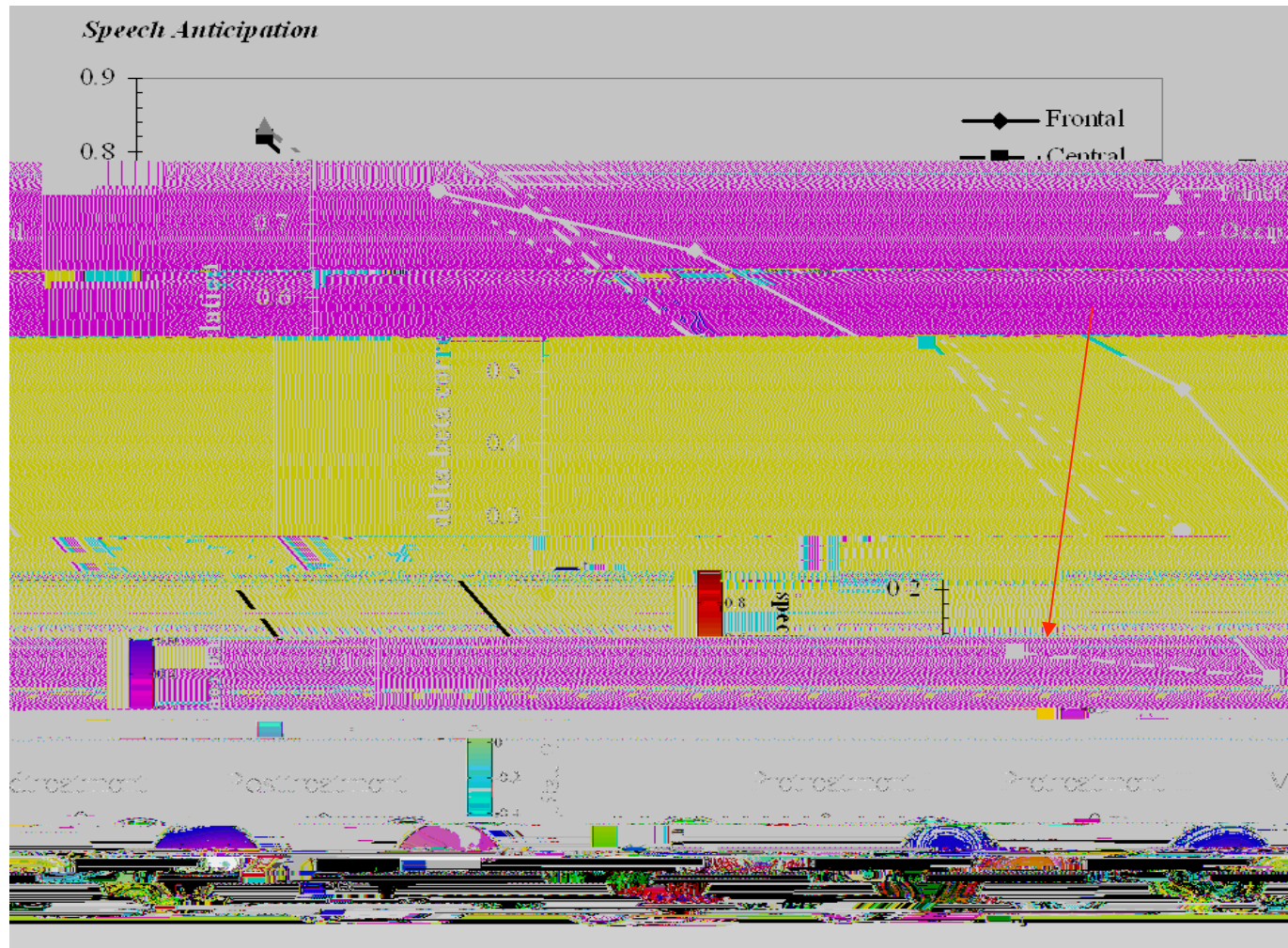
Assessments

- ! Pre-treatment 1
- ! Pre-treatment 2
- ! Mid-treatment (after session six)
- ! Post-treatment

Symptom changes



Changes in delta-beta correlation during CBT for SAD in response to speech anticipation



Summary



- ! Part I: Basic Science
 - ! Issues of stability
 - ! Individual characteristics stable across time and context
 - ! Individual X context interactions
 - ! Individual characteristics interact with different environmental conditions within and outside of the individual to confirm risk and protection
 - ! Malleability and change
 - ! Individual characteristics are open to change

Outline



- ! Part II: Educational and Policy Implications
 - ! Not at all shy children are alike
 - ! Searching for moderating influences (e.g., biology, parenting, peers relations, school environments) between temperamental shyness and problem behaviour



Not all shy children are alike

Conceptualizing different types of childhood shyness

Some people are quiet and reserved in social situations (Cheek & Buss, 1981)...

- 1) Are they this way because they prefer to be alone rather than with others (i.e., introverts)?
- 2) Are they this way because they feel anxious in social situations (i.e., shy)?

Shyness

(withdrawal)

High

Low

High

Sociability

(approach)

Low

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|--|--|
| | |
| | |

Sample items:

Shyness: "I feel inhibited in social situations"

Sociability: "I like to be with people"

Shyness

(withdrawal)

High

Low

High

Sociability

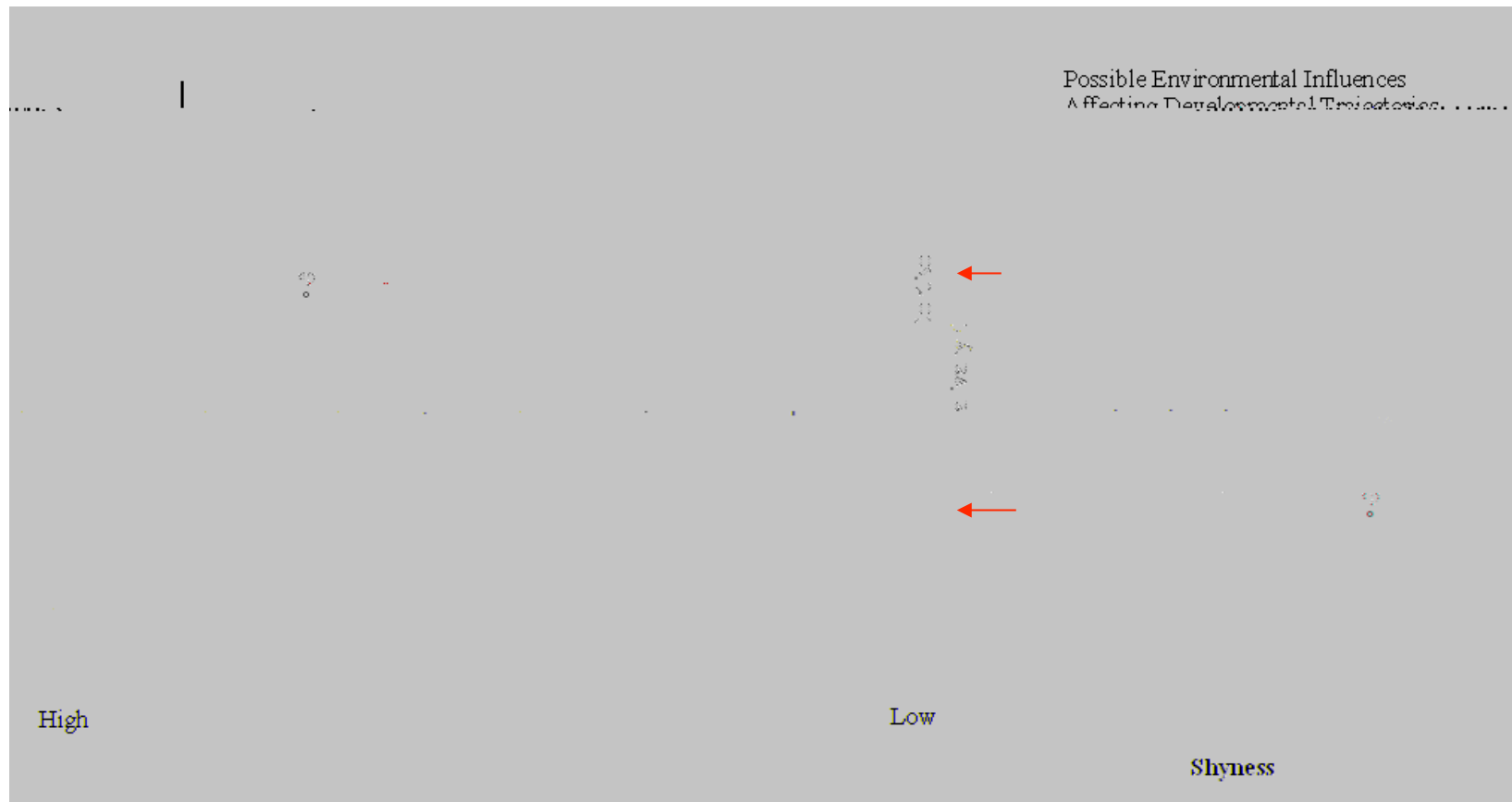
(approach)

Low

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Searching for moderating influences



Schmidt, L.A., Santesso, D.L., Schulkin, J., & Segalowitz, S.J. (2007). Shyness is a necessary but not sufficient condition for high salivary cortisol in 10 year-old children. *Personality and Individual Differences, 43*, 1541-1551.

General conclusions



- ! Temperamental shyness
 - ! Stable, distinct behavioural and psychophysiological correlates
 - ! Interactions with environments conceptualized as conditions within and outside the individual to confer good and bad outcomes
 - ! Open to change
 - ! Different types of shy children
 - ! Agnostic regarding the causal relation between shyness and problem behavior
 - ! Need to identify moderating factors (e.g., school environments, parenting) and target that level for intervention, affecting positive change and development

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