Autonomic Inflexibility in Early Adolescence is Related to CU Traits During Parent-Child Interactions

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BACKGROUND

- Conduct Disordered youth with Callous-Unemotional (CU) traits mark a subgroup at risk for severe aggression
- CU traits are associated with blunted autonomic functioning.
- Little is known about the relationship between CU traits and autonomic flexibility as environmental demands change

STUDY AIMS

1. Model Respiratory Sinus Arrythmia (RSA) flexibility using a piecewise Linear Growth Curve Model (LGCM) across 3 different interactions (See **Figure 1**)
2. Test for differences in RSA among youth with and without clinically serve CU traits

METHODS

- N: 162 (ages 10-14, M_{age} = 12.03, 47% female)
- N: 29 with clinically severe CU traits
- RSA across 3 time periods:
  1. Reading to a Parent and an RA: 4 mins
  2. Transition/Recovery Period: 2 mins
  3. Conflict Discussion with a Parent: 8 mins

RESULTS

AIM 1: Multiphase Linear Growth Curve Model

Estimated RSA trajectory derived from fitted model (See **Figure 2**)

- Intercept (**a**; *M*= 6.78, p<.001)
- Slope of reading (**b**.; *M*= -.082, p<.001)
- Slope of recovery from reading (**c**.; *M*= .115, p<.001)
- Slope of conflict discussion (**d**.; *M*= -.013, p<.05).

AIM 2.1: Multivariate Regression Model

Intercept and 3 slope factors were regressed onto a dichotomous CU traits (1= above clinical cut-off) predictor (See **Table 1**)

- Age, sex, minority status, verbal IQ, conduct problems, anxiety and affective instability were covariates
- CU traits clinical status sig. associated with RSA change during reading **(β= .63, p<.01)** and recovery **(β= -.48, p<.05)**

AIM 2.2: Satorra-Bentler Scaled Chi-Square Tests

Chi-Square tests compared RSA trajectories for youth above/below the clinical cut-off (See **Figure 3**)

- Compared a free model to a model with each factor subsequenty fixed (See **Table 2**)
- CU youth showed sig. different RSA patterns during reading **(Δχ2 = 4.88, *p* <.05)** and recovery **(Δχ2 = 4.11, *p* <.05)**
- RSA change for all 3 periods were not sig. for CU youth (See **Table 2)**

CONCLUSIONS

- Youth with clinically impairing CU traits can be characterized by autonomic inflexibility

Reduced RSA Flexibility Across Three Different Interaction Periods Differentiate **Youth** with Clinically Severe **Callous-Unemotional Traits**

Figure 3: Estimated Multigroup and Full Piecewise LGCM

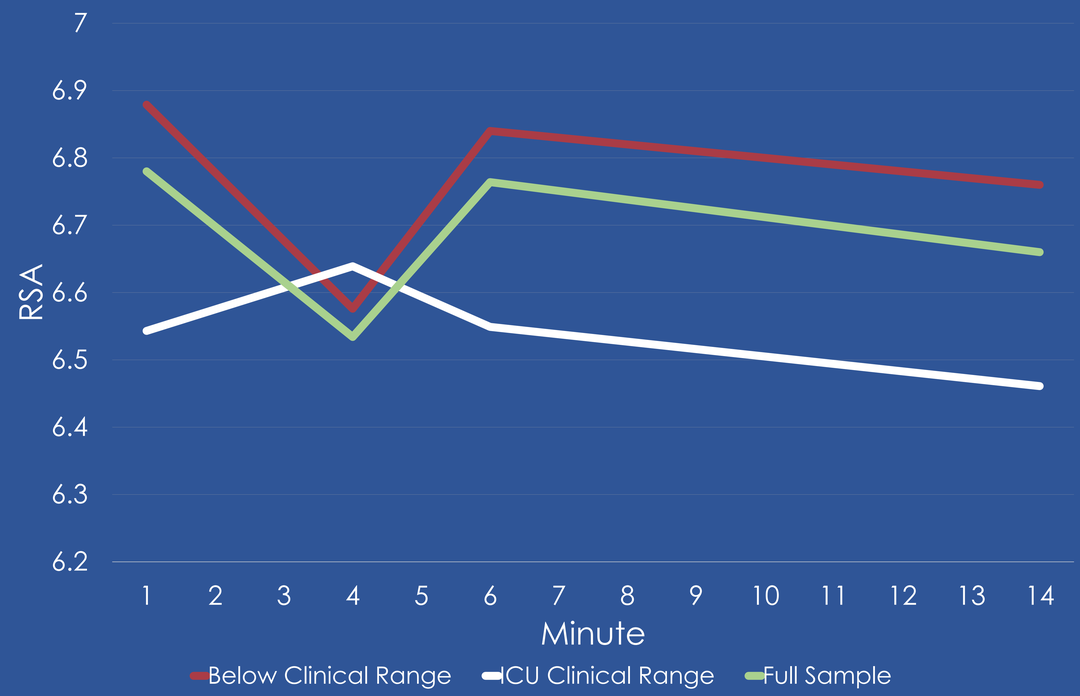

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Figure 1: Piecewise LGCM

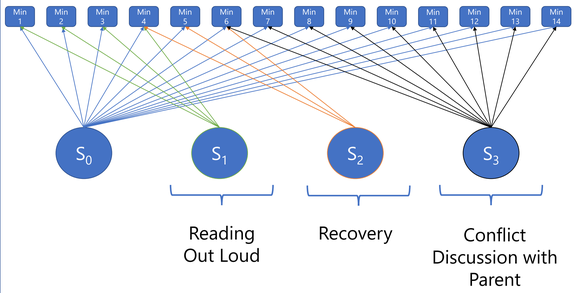

Figure 2: Estimated Piecewise LGCM

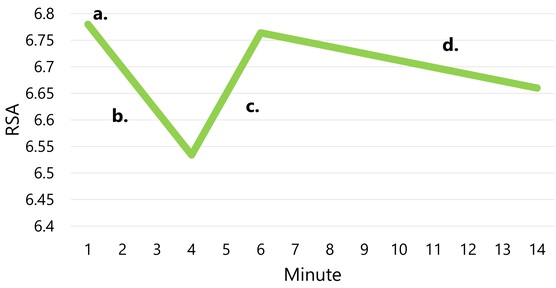

Table 1: Multivariate Regression Model

Regressors	Intercept		Slope of Reading Out Loud		Slope of Recovery		Slope of Conflict Discussion	
Dichotomous Variables	**β**	**S.E.**	**β**	**S.E.**	**β**	**S.E.**	**β**	**S.E.**
CU Traits Clinical Cut-Off	-.15	.10	**.63****	**.22**	**-.48***	**.20**	-.09	.13
Sex	.14	.10	-.31	.28	.24	.23	-.10	.15
Minority Status	.15	.11	-.36	.30	.08	.25	.12	.18
Continuous Variables								
Age	-.01	.11	-.06	.27	-.12	.24	.18	.14
Verbal IQ	-.09	.11	-.20	.32	-.19	.31	.12	.23
Conduct Problems	.12	.13	**-.9****	**.27**	.45	.31	-.03	.18
Anxiety	-.16	.12	.19	.28	-.12	.24	-.01	.14
Affective Instability	-.09	.11	**.70****	**.27**	-.18	.23	.13	.14

p< .05*, *p*<.01**, *p*<.001***, two-tailed.

Table 2: Satorra-Bentler Scaled Chi Square Tests

	Clinical Cut-Off	
Latent Factors	**Below** *n* = 115	**Above** *n* = 29
Intercept	6.87***[a]	6.52***[a]
Slope of the Reading	-.10***[a]	.03[b]
Slope of Recovery	.15***[a]	-.01[b]
Slope of Conflict Discussion	-.01[a]	-.02[a]

Note: Superscript letters indicate statisitcally signifanct differences between groups on latent facotres (i.e. a and b indicate a statisitcally signficant difference of *p*<.05).
p< .05*, *p*<.01**, *p*<.001***, two-tailed.