Factors Impacting Emotional Reactivity and Regulation in Young Children

CIRCLE Lab

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Introduction

Emotional Regulation and Reactivity

- Emotional Regulation: the ability to exert control over your own emotional state
  - E.g., "I control my emotions by changing the way I think about the situation "
- Emotional Reactivity: the tendency to experience frequent and intense emotional arousal
  - E.g., "When I feel emotional, it's hard for me to imagine feeling any other way"

Environment and Experiences: The Impact of Threat and Deprivation

- Threat is associated with changes in neural circuits that underlie emotional learning [1,2]
  - Changes in hippocampus, amygdala, and ventromedial prefrontal cortex
  - At risk children often develop nonoptimal emotional regulation strategies (e.g., [examples… disengagement, avoidance…])
- Deprivation studies show reduced cortical thickness in the association cortex, disruptions in prefrontal cortex function, and declines in cognitive function [1]

Parent and Child Factors

- Unpredictable parenting is associated with disturbed maturation of emotional circuits [3, 4]
- Parental reactivity is related to heightened reactivity in offspring [5]
  - Possible pathways include *modeling* and *expected response performance*
- IQ may impact emotional regulation (ER) and reactivity [6]
  - Flexible thinking and strong problem-solving ability are related to increased ER strategies
  - Higher IQ is linked to higher self-regulation scores, heightened emotional discrimination, and higher emotional intelligence in children

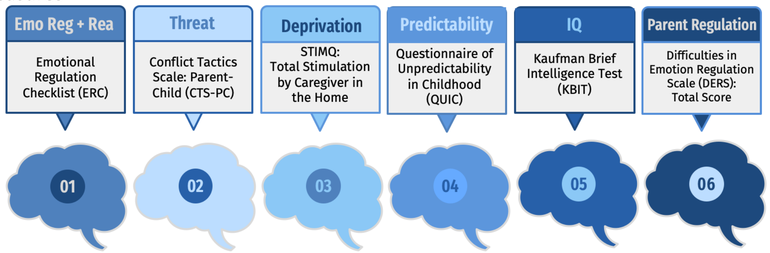
The current study investigates the impact of child IQ, child emotion reactivity, adverse experiences, and parent factors (i.e., predictability, emotion regulation) on child emotional regulation and reactivity in young children (4-7 years).

Methods

Participants

- 88 Children aged 4-7 (*M* = 5.73 years) and their caregivers

Measures



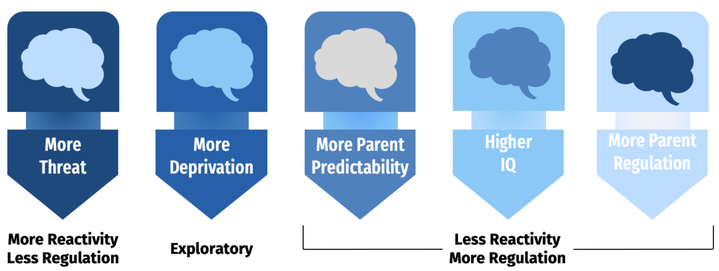
Data Collection

- Caregivers and their children engaged in 3 visits (one at-home, two in lab). Data on emotion regulation and adversity was collected via a secure online survey system (Qualtrics)
- Parent surveys provided data for the ERC, CTS-PC, STIMQ, QUIC, and DERS
- IQ data was collected via the KBIT. The KBIT was conducted by trained research assistants

Data Analysis

- Descriptive statistics, regression analyses, and moderation analyses were conducted in SPSS

Hypotheses



Results: Correlations and Regressions

Correlation matrix assessing the relationship between each child factor, environmental/ experiential circumstance, and parent factor:

Correlation Matrix for Key Study Variables	1	2	3	4	5	6	7	8
1. Emotional Reactivity	--							
2. Emotional Regulation	-.30**	--						
3. Composite Standard KBIT Score	-.13	.11	--					
4. Cognitive Stimulation	-.11	.30**	.45**	--				
5. Threat	.16	-.01	.20	.06	--			
6. Parental Predictability	-.30**	.22*	.07	.15	-.15	--		
7. Parent Difficulties in Emotion Regulation	.51**	-.34**	.02	-.10	-.06	-.23*	--	
8. Age in Years	-.01	.04	.25*	.28**	.24*	.13	-.05	--

*$p < .05$, **$p < .01$

Regression utilizing the Liability and Negativity subscale to assess emotional reactivity. Indicates parent dysregulation is significantly related to emotional reactivity in children, and threat approached a clinically significant impact on emotional reactivity

Table 3. Regression Table for Liability/Negativity Subscale from Emotional Regulation Checklist

Coefficients	β	t	Sig.
Constant	---	3.12	0.00
Participant Age in Years	-0.09	-0.72	0.48
Composite Standard KBIT Score	-0.16	-1.23	0.23
Threat	0.22	1.79	0.08
Cognitive Stimulation	0.09	0.72	0.48
Parental Predictability	-0.07	-0.60	0.55
Parent Difficulties in Emotion Regulation	0.53	4.45	0.00

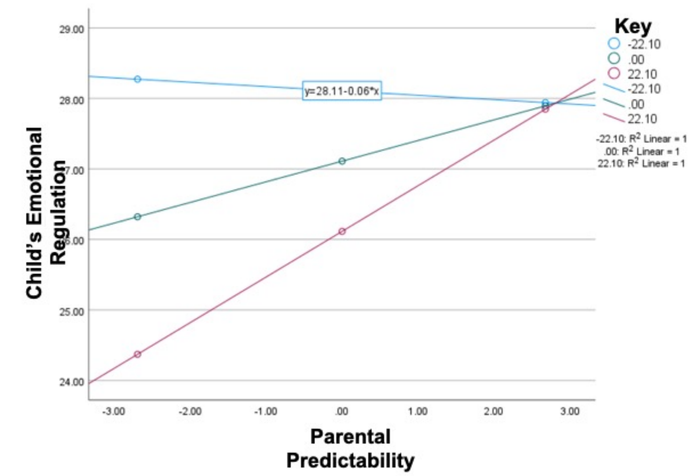
Regression utilizing the Emotional Regulation subscale to assess emotional regulation. Indicates that more cognitive stimulation is associated with more emotional regulation and more parental predictability and less parental emotional dysregulation both approach clinical significance when considered as factors that impact emotional regulation

Table 4. Regression Table for Emotional Regulation from Emotional Regulation Checklist

Coefficients	β	t	Sig.
Constant	---	2.45	0.02
Participant Age in Years	0.10	0.86	0.39
Composite Standard KBIT Score	-0.07	-0.59	0.55
Threat	0.08	0.63	0.54
Cognitive Stimulation	0.35	2.80	0.01
Parental Predictability	0.23	1.96	0.05
Parent Difficulties in Emotion Regulation	-0.24	-2.00	0.05

Results: Moderation Analysis

Figure 1. Parent emotion dysregulation as a moderator between parental predictability and child emotion regulation using PROCESS, a convenient, free, and easy-to-use computational add on for SPSS and SAS documented by Hayes (2013)



Conclusions

- Threat was not significantly associated with emotion regulation or reactivity
- Child's IQ was not significantly associated with emotion regulation or reactivity
- Deprivation and parental predictability are related to emotional regulation such that more cognitive stimulation and parental predictability were linked to increased regulation in children.
- Parental regulation impacts both emotional regulation and reactivity such that more parental emotional dysregulation is related to more reactivity and less regulation in the child.
- Parental predictability's impact on child regulation is moderated by parental emotional regulation

Overall, parent factors and environment/experiences heavily impacted the emotional regulation and reactivity of young children while child factors did not. Further research should explore the moderating relationship of parental predictability and regulation, and continue to explore the impact of IQ on emotionality across the lifespan.

References

[1] Sheridan MA, McLaughlin KA. Dimensions of early experience and neural development: deprivation and threat. Trends Cogn Sci. 2014 Nov;18(11):580-585. doi: 10.1016/j.tics.2014.09.001. Epub 2014 Oct 7. PMID: 25305194; PMCID: PMC4252647.

[2] Thompson, Ross & Calkins, Susan. (1996). The double-edged sword: Emotional regulation for children at risk. Development and Psychopathology. 8. 163 - 182. 10.1017/S0954579400007021.

[3] Glynn, L. M., & Baram, T. Z. (2019). The influence of unpredictable, fragmented parental signals on the developing brain. Frontiers in Neuroendocrinology, 53, Article 100736. https://doi.org/10.1016/j.yfrne.2019.01.002

[4] Scaramella, L. V., & Leve, L. D. (2004). Clarifying parent-child reciprocities during early childhood: The early childhood coercion model. Clinical Child and Family Psychology Review, 7(2), 89–107. https://doi.org/10.1023/B:CCFP.0000030287.13160.a3

[5] Davies, P. T., Sturge-Apple, M. L., Cicchetti, D., Manning, L. G., & Zale, E. (2009). Children's patterns of emotional reactivity to conflict as explanatory mechanisms in links between interpartner aggression and child physiological functioning. Journal of Child Psychology and Psychiatry, 50(11), 1384–1391. https://doi.org/10.1111/j.1469-7610.2009.02154.x

[6] Calero, M. D., García-Martín, M. B., Jiménez, M. I., Kazén, M., & Araque, A. (2007). Self-regulation advantage for high-IQ children: Findings from a research study. Learning and Individual Differences, 17(4), 328–343. https://doi.org/10.1016/j.lindif.2007.03.012

[7] Shields, A. M. & Cicchetti, D. "The development of an emotion regulation assessment battery: Reliability and validity among at-risk grade-school children," Indianapolis, IN: Poster session presented at the biennial meeting of the Society for Research in Child Development, March 1995.

[8] Straus, Murray & Hamby, Sherry & Boney-McCoy, Sue & Sugarman, David. (1996). The Revised Conflict Tactics Scales (CTS2): Development and Preliminary Psychometric Data. Journal of Family Issues - J FAM ISS. 17. 283-316. 10.1177/019251396017003001.

[9] Mendelsohn, A. L.; Dreyer, B. P.; Tamis-LeMonda, C. S.; Ahuja, P. Validity of StimQ, a Scale for Assessing the Cognitive Home Environment,, Journal of Developmental & Behavioral Pediatrics: October 1999 - Volume 20 - Issue 5 - p 399

[10] Glynn LM, Stern HS, Howland MA, Risbrough VB, Baker DG, Nievergelt CM, Baram TZ, Davis EP. Measuring novel antecedents of mental illness: the Questionnaire of Unpredictability in Childhood. Neuropsychopharmacology. 2019 Apr;44(5):876-882. doi: 10.1038/s41386-018-0280-9. Epub 2018 Nov 23. PMID: 30470840; PMCID: PMC6461958.

[11] Alan S Kaufman and Nadeen L Kaufman. (2004) Kaufman Brief Intelligence Test Kbit 2 ; Manual. Pearson, 2004.

[12] Hayes, A. F. (2017). Introduction to mediation, moderation, and conditional process analysis: A regression-based approach. Guilford publications.