



Parental child-rearing strategies influence self-regulation, socio-emotional adjustment, and psychopathology in early adulthood: Evidence from a retrospective cohort study

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ABSTRACT

This study examined the association between recollected parental child-rearing strategies and individual differences in self-regulation, socio-emotional adjustment, and psychopathology in early adulthood. Undergraduate participants ($N = 286$) completed the EMBU – a measure of retrospective accounts of their parents' child-rearing behaviors – as well as self-report measures of self-regulation and socio-emotional adjustment across the domains of eating disorder symptoms, physically risky behavior, interpersonal problems, personal financial problems, and academic maladjustment. A subset of participants also completed the Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF). Parental warmth was found to be related to overall better self-regulation and improved interpersonal and academic adjustment. In contrast, both parental rejection and overcontrol were found to be related to general deficits in self-regulation as well as adjustment difficulties and psychopathology. Parental rejection was most closely related to internalizing clinical presentations like anxiety, depression, and somatization, whereas overcontrol was most aligned with increased hypomanic activation and psychoticism. Mediation analyses demonstrated that the relationships between parental child-rearing strategies and socio-emotional adjustment and psychopathology were partially mediated by self-regulation. Future directions are suggested, including basic and translational research related to better understanding the roles of parental child-rearing and self-regulation in the development of internalizing symptoms, activation, and psychotic symptoms.

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1. Introduction

The importance of parental child-rearing strategies in shaping children's personality development is inarguable. Above and beyond the contribution of genetics (e.g., Eisenberg, Spinrad, & Eggum, 2010), the National Institute of Child Health and Human Development's report on Biobehavioral Development (NICHD, 2001) identified that parental child-rearing strategies likely have long-term implications for the development of personal strengths, socio-emotional adjustment, and mental health. However, more research is needed to pinpoint the *specific* consequences of child-rearing on early adult life. Such studies would have significant public health implications and support our basic understanding of personality, psychopathology, and lifespan development.

Based on Bowlby's (1969) attachment theory, parental child-rearing behaviors are often classified across a few broad domains (Arnold, O'Leary, Wolff, & Acker, 1993; Baumrind, 1978; Rohner & Pettengill, 1985). For the sake of this study, we utilized Rohner and Pettengill's (1985) conceptualization, which has been used most frequently in similar studies and operationalizes parental child-rearing along three domains: warmth, overcontrol, and rejection. A number of studies conducted in China, South Korea, and US have related these parental child-rearing strategies to general indicators of adjustment in childhood and adolescence, including self-regulation, self-esteem, and distress (e.g., Morris, Silk, Steinberg, Myers, & Robinson, 2007; Wansoo, 2009; Xiuqin et al., 2010).

Studies examining adjustment in adulthood have similarly focused on non-specific outcomes. Given that prospective studies connecting parental child-rearing strategies in childhood to eventual adjustment in adulthood can be prohibitively expensive, these studies have drawn upon a psychometrically-strong retrospective measure of parental child-rearing strategies, the EMBU (Perris, Jacobsson, Linnstrom, Von Knorring, & Perris, 1980). The EMBU was originally developed in Sweden as the Egna Minnen

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Beträffande Uppfostra, or “My Memories for Upbringing,” and has been translated into several languages. EMBU scores have demonstrated good reliability, validity, and structural invariance across diverse samples (e.g., Arrindell et al., 2001; Deković et al., 2006; Petrowski et al., 2009) and, importantly, correspond closely to parents’ self-report of their own child-rearing practises (Aluja, del Barrio, & García, 2006). Studies using the EMBU conducted in Australia, Croatia, China, Germany, Greece, the UK, and the US have found parental child-rearing strategies to be associated with self-regulation, subjective well-being, self-esteem, overall interpersonal adjustment, general distress, and depression in adulthood (Abar, Carter, & Winsler, 2009; Avagianou & Zafiropoulou, 2008; Fang, Qian, Luo, & Zi, 2009; Flouri, 2007; Huppert, Abbott, Ploubidis, Richards, & Kuh, 2010; Petrowski et al., 2009; Strage, 1998; Winefield, Goldney, Tiggemann, & Winefield, 1989). Existing studies demonstrate the significance of parental child-rearing strategies, but are limited in that outcome measures were non-specific and chosen without regard to a broader conceptual frame.

In the present study, we used Hoerger, Quirk, and Weed’s (2011) self-regulation conceptual framework to guide the choice of specific indicators of adult adjustment. According to that framework, self-regulation is an umbrella construct covering a broad range of microconstructs (e.g., ego control, delay of gratification, and ego resiliency) that all involve altering one’s responses to achieve desired goals. Drawing upon six decades of research on the construct (e.g., Mischel, 1996), Hoerger and colleagues have theorized that self-regulation involves altering responses across five specific life domains: eating behaviors, physical pleasures, social interactions, financial management, and achievement. Examples include maintaining a healthy diet, minimizing substance abuse, engaging in prosocial behaviors, keeping a budget, and pursuing educational activities. In the present study, we examined the relationship between self-reported parental child-rearing strategies (using the EMBU) and self-regulation and socio-emotional adjustment across the five hypothesized domains. Acknowledging the potential gaps in any specific framework, we also administered the 338-item Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF; Ben-Porath & Tellegen, 2008) to a subset of participants to examine psychopathology symptoms across a broad range of domains. The MMPI-2-RF is the latest version of the MMPI (Hathaway & McKinley, 1940), the most frequently administered self-report measure of adult psychopathology (for reviews, see Ketterer, Han, Hur, & Moon, 2010; Monnot, Quirk, Hoerger, & Brewer, 2009). Specifically, we hypothesized that the parental child-rearing strategy of warmth would be associated with greater self-regulation, better adjustment, and less psychopathology in early adulthood, while rejection and control would be associated with the opposite pattern of outcomes. Furthermore, we hypothesized that self-regulation would mediate the relationship between parental child-rearing and socio-emotional adjustment/psychopathology.

2. Methods

2.1. Participants and procedures

The present study involved primary analyses of parental child-rearing data collected adjunctively at one site during a large, multisite investigation (Hoerger et al., 2011), which was approved for ethical compliance by the university’s Institutional Review Board. Participants were young adults recruited from a large Midwestern university ($N = 286$; ages 18–35, $M = 19.7$, $SD = 2.1$; 65.1% female; 90.1% white). They completed the vast majority of study measures online; however, a subsample of participants ($n = 56$) also attended a group laboratory session, where they completed

the MMPI-2-RF (Ben-Porath & Tellegen, 2008). Analyses were conducted using casewise comparisons. All participants provided informed consent and received extra credit and/or a small bag of candy as thanks for participation.

2.2. Measures

2.2.1. Parental child-rearing strategies

The 23-item English-language version of the EMBU (Arrindell et al., 1999) was used to measure participants’ retrospective accounts of their parents’ child-rearing behaviors. As noted in Section 1, EMBU scores have demonstrated evidence of good internal consistency, test-retest reliability, validity, structural invariance across demographic groups, and inter-rater agreement (e.g., Aluja et al., 2006; Arrindell et al., 2001; Deković et al., 2006; Petrowski et al., 2009). In the current study, participants rated each of their parents on 23 items measuring three dimensions: warmth ($\alpha = .88$; e.g., “My parents praised me”), rejection ($\alpha = .85$; e.g., “My parents criticized me and told me how lazy and useless I was in front of others”), and control ($\alpha = .86$; e.g., “I felt that my parents interfered with everything I did”), using 4-point response scales. Participant data were absent for 1 (0.3%) of the maternal ratings and 20 (7.0%) of the paternal ratings. We initially examined the correlates of child-rearing behaviors for maternal and paternal ratings separately; however, there were zero statistically significant differences in findings across parents, so ratings were averaged across available parents.

2.2.2. Self-regulation

Three measures of self-regulation were administered. The 37-item Ego-Undercontrol Scale ($\alpha = .85$; Letzring, Block, & Funder, 2004) measured impulsivity and emotional dysregulation (e.g., “My way of doing things can be misunderstood or bother others”). The 14-item Ego-Resiliency Scale ($\alpha = .74$; Letzring et al., 2004) assessed ego-resiliency and emotional competency (e.g., “I quickly get over and recover from being startled”). Both the EUS and ERS used 4-point response scales. Finally, the 35-item Delaying Gratification Inventory ($\alpha = .87$; Hoerger et al., 2011) measured individual differences in gratification delay along five domains: eating behaviors, physical pleasures, social behavior, financial management, and achievement. Participants responded to items (e.g., “I have given up physical pleasure or comfort to reach my goals”) using a 5-point response scale.

2.2.3. Socio-emotional adjustment

Adjustment problems were measured across five domains: eating disorder symptoms, physically risky behavior, interpersonal problems, financial problems, and academic maladjustment. The 33-item Dutch Eating Behavior Questionnaire ($\alpha = .93$; van Strien, Frijters, Berger, & Defares, 1986) was used to measure eating behaviors. The scale measures three symptom domains: restrained eating, emotional eating, and external eating (greater vulnerability to eating when food is available in the immediate environment), with items (e.g., “Do you have a desire to eat when you are feeling lonely?”) rated on a 5-point scale. Items adapted from the Add Health Questionnaire (Resnick et al., 1997) were used to measure physically risky behaviors involving sex, drugs, and alcohol ($\alpha = .82$, 30 items, e.g., “Have you ever used chewing tobacco?”) and financial problems ($\alpha = .57$, 10 items, e.g., “Do you have any credit card debt?”), and response scales varied by item. The 32-item Inventory of Interpersonal Problems-Short Circumplex form ($\alpha = .92$; Soldz, Budman, Demby, & Merry, 1995) was used to measure eight problematic interpersonal styles: domineering, vindictive, cold, socially avoidant, nonassertive, exploitable, overly nurturant, and intrusive. Items assessing interpersonal behaviors (e.g., “It is hard for me to tell a person to stop bothering me”) were

rated on a 5-point scale, with higher scores indicating greater interpersonal problems. The 25-item Academic Maladjustment scale from the Student Adaptation to College Questionnaire ($\alpha = .86$; Baker & Siryk, 1989) was used to measure a wide range of academic adjustment problems. Items (e.g., “Lately I have been having doubts regarding the value of a college education”) were rated on a 9-point scale.

2.2.4. Psychopathology

The 338-item MMPI-2-RF (Ben-Porath & Tellegen, 2008) uses a true-false response format to measure 50 overlapping dimensions of adult psychopathology: 3 higher order symptom scales, 9 broad clinical scales, 5 scales measuring pathological aspects of personality, 5 somatic scales, 9 internalizing scales, 4 externalizing scales, 5 interpersonal scales, 2 interest scales, and 8 validity scales. In the current study, participants completed the MMPI-2-RF in group format within two weeks of the other measures.

2.3. Analytic approach

First, simple relationships between parental child-rearing and self-regulation and socio-emotional adjustment/psychopathology were estimated using correlations. Then, regression analyses were conducted to assess whether self-regulation mediated the relationship between parental child-rearing and adjustment/psychopathology (i.e., path analyses testing for mediation). Principal Component Analysis (PCA) was used as a data-reduction strategy (Jolliffe, 2002) to derive composite indicators of effective parental child-rearing (based on EMBU warmth, rejection, and control scores), self-regulation (based on total scores from the Ego Undercontrol Scale, Ego-Resiliency Scale, and Delaying Gratification Inventory), adjustment (based on total scores from the Dutch Eating Behavior Questionnaire, Add Health Questionnaire Physical and Financial scales, Inventory of Interpersonal Problems, and Student Adaptation to College Questionnaire), and psychopathology (based on MMPI-2-RF scores on the three higher-order scales).

3. Results

Table 1 shows correlations between parental child-rearing variables and scores on measures of self-regulation and adjustment. Table 2 shows correlations with MMPI-2-RF scores on all Higher Order Scales, Restructured Clinical Scales, and Personality Psychopathology Five Scales, as well as significant findings from other MMPI-2-RF scales.

3.1. Warmth

Parental warmth was associated with overall self-regulation and specifically with the ability to delay gratification related to achievement goals. Parental warmth was also associated primarily with interpersonal and academic adjustment. Interpersonal benefits include greater warmth toward, engagement with, and trust in others. Academic benefits include greater general academic adjustment, academic delay of gratification, and resiliency.

3.2. Rejection

Parental rejection was associated with general deficits in self-regulation and specifically with difficulty delaying gratification related to physical pleasures, financial decisions, and achievement-related goals. Parental rejection was also clearly associated with adjustment difficulties and psychopathology, and was most closely related to distrust and distress-related somatic complaints. Specifically, rejection was associated with suspiciousness (RC6:

Table 1

The association between parental child-rearing and self-regulation and adjustment.

Measure	Warmth	Rejection	Control
<i>Self-regulation</i>			
Ego-Undercontrol (EUS)	.02	.32***	.16**
Ego-Resiliency (ERS)	.20***	.08	-.12*
Delaying of gratification (DGI)	.07	-.19**	-.06
Food	-.06	-.07	-.04
Physical pleasures	.04	-.23***	-.13*
Social behavior	.09	-.11	.05
Money	-.01	-.13*	-.05
Achievement	.20***	-.13*	-.05
<i>Eating disorder symptoms (DEBQ)</i>			
Restrained eating	.04	.18**	.16**
Emotional eating	.04	.11	.13*
External eating	.07	.15*	.19**
<i>Physically risky behavior (AHQ)</i>			
Substance problems	-.01	.26***	.15*
Cigarette smoking	-.10	.22***	.17***
Alcohol use	.02	.16**	.12*
Marijuana use	-.04	.15*	.09
Risky sexual behavior	-.08	.14*	.07
Number of sexual partners	-.03	.17**	.08
<i>Social problems (IIPSC)</i>			
Domineering	-.05	.14*	.08
Vindictive	-.10	.16**	.11
Cold	-.28***	.23***	.13*
Socially avoidant	-.25***	.14*	.07
Nonassertive	-.16**	.14*	.07
Exploitable	-.10	.22***	.18**
Overly nurturant	-.06	.20***	.22***
Intrusive	-.01	.18**	.20***
<i>Personal financial problems (AHQ)</i>			
Financial problems	-.03	.17**	.07
<i>Achievement problems (SACQ)</i>			
Academic maladjustment	-.26***	.24***	.11

Note: $N = 286$. EUS = Ego-Undercontrol Scale, ERS = Ego-Resiliency Scale, DGI = Delaying Gratification Inventory, DEBQ = Dutch Eating Behavior Questionnaire, AHQ = Add Health Questionnaire, IIPSC = Inventory of Interpersonal Problems – Short Circumplex, SACQ = Student Adaptation to College Questionnaire.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

$r = .43$) and self-doubt (SFD: $r = .39$), as well as increased distress, demoralization, and anxiety, primarily manifesting in neurological somatic complaints (e.g., headaches and subjective memory and attention difficulties; RC1: $r = .42$; NUC: $r = .36$). Additionally, rejection was associated with greater emotional and cognitive dysregulation, interpersonal problems, academic problems, personal financial problems, and physical pleasure seeking around eating, substance use, and risky sexual behavior.

3.3. Control

Parental control was related to general problems with self-regulation and specifically with difficulties delaying gratification related to physical pleasures. Parental control was also associated with several areas of adjustment and psychopathology, such as activation (ACT: $r = .44$), which includes hypomanic symptoms involving excitation, energy, uncontrolled mood swings, and decreased need for sleep (Ben-Porath & Tellegen, 2008), and psychotism (PSYC-r: $r = .28$), including increased experience of aberrant experiences (RC8: $r = .36$). Lastly, parental control was related to increased somatic and neurological complaints, emotional and cognitive dysregulation, interpersonal problems, and physical pleasure seeking around eating and substance use.

Table 2

The association between parental child-rearing and psychopathology on the MMPI-2-RF.

MMPI-2-RF scale	Warmth	Rejection	Control
<i>Higher order scales</i>			
Emotional/Internalizing (EID)	-.08	.26*	.14
Thought dysfunction (THD)	.07	.30*	.29*
Behavioral/Externalizing (BXD)	-.11	.22	.08
<i>Restructured clinical scales</i>			
Demoralization (RCd)	-.13	.31*	.21
Somatic complaints (RC1)	-.01	.42***	.30*
Low positive emotions (RC2)	-.05	.07	-.03
Cynicism (RC3)	-.04	.02	.23
Antisocial behavior (RC4)	-.04	.19	.09
Ideas of persecutions (RC6)	-.27*	.43***	.10
Dysfunctional negative emotions (RC7)	.02	.35**	.32*
Aberrant experiences (RC8)	.01	.31*	.36**
Hypomanic activation (RC9)	-.01	.19	.21
<i>Personality psychopathology five</i>			
Aggressiveness (AGGR-r)	-.09	.10	.15
Psychoticism (PSYC-r)	-.06	.25	.28*
Disconstraint (DISC-r)	-.05	.21	.07
Negative emotionality (NEGE-r)	.01	.27*	.24
Introversion (INTR-r)	-.03	-.08	-.11
<i>Somatic</i>			
Head pain complaints (HPC)	-.09	.26*	.11
Neurological complaints (NUC)	-.04	.36**	.29*
Cognitive complaints (COG)	-.05	.31*	.21
<i>Internalizing</i>			
Self-doubt (SFD)	-.09	.39**	.11
Inefficacy (NFC)	.01	.23	.27*
Anxiety (AXY)	.00	.34**	.11
<i>Externalizing</i>			
Activation (ACT)	.15	.23	.44***
<i>Interpersonal</i>			
Family problems (FML)	-.07	.33*	.28*

Note: $n = 56$. MMPI-2-RF = Minnesota Multiphasic Personality Inventory-2-Restructured Form. Parenthetical acronyms refer to official MMPI-2-RF scale names.

* $p < .05$.** $p < .01$.*** $p < .001$.

3.4. Mediation analyses

Finally, path (regression) analyses were used to test whether the relationship between parental child-rearing strategies and overall adjustment and psychopathology was mediated by self-regulation. As shown in Fig. 1, parental child-rearing strategies were directly and indirectly associated with adjustment and psychopathology, with the relationship partially mediated by self-regulation. More specifically, self-regulation explained 24% of the relationship between parental child-rearing strategies and adjustment [($.34 - .26$)/ $.34 = .24$], which was statistically significant using the Sobel (1982) test, $Z = 3.30$, $p < .001$. Similarly, self-regulation explained 19% of the relationship between parental child-rearing

strategies and psychopathology [($.36 - .29$)/ $.36 = .19$], which was also statistically significant, $Z = 2.15$, $p < .05$. Direct effects of parental child-rearing strategies on adjustment ($\beta = .26$) and psychopathology ($\beta = -.29$) were also statistically significant ($p < .05$), supporting partial mediation (Baron & Kenny, 1986).

4. Discussion

In the current investigation, parental warmth was related to better intra- and interpersonal adjustment in early adulthood, which echoes findings from previous research (e.g., Huppert et al., 2010; Petrowski et al., 2009). Specifically, this study links parental warmth to three important areas of functioning in early adulthood: self-regulation, interpersonal adjustment, and academic adjustment. Of these three constructs, interpersonal functioning has been the most investigated (e.g., Petrowski et al., 2009), and this study adds to the literature by focusing on specific interpersonal outcomes (e.g., greater trust in others), which can be used to guide the further investigation of these constructs.

Also in line with previous work, parental rejection and overcontrol were associated with worse adjustment (e.g., Petrowski et al., 2009). Several preexisting studies point specifically to the relationship between less effective child-rearing and depression (Avagianou & Zafropoulou, 2008; Wansoo, 2009; Winefield et al., 1989). In contrast, this study utilized a fine-grained approach which investigated parental rejection and overcontrol separately as indicated by theory (Rohner & Pettengill, 1985). Findings differed between constructs, suggesting that future work should investigate these constructs separately. Specifically, parental rejection was most closely related to internalizing clinical presentations like anxiety, depression, and somatization, while overcontrol was associated instead with hypomanic activation and psychoticism.

Though the process by which parental child-rearing affects adjustment/psychopathology has yet to be elucidated, both rejection and overcontrol likely result in the inadequate development of self-regulatory and coping skills. The theoretical and empirical groundwork has been laid to better understand links between self-regulation and socio-emotional adjustment in early adulthood, including the development of internalizing symptoms (Klenk, Strauman, & Higgins, 2011; Koestner, Taylor, Losier, & Fichman, 2010). In the context of being less able to cope with stress, it could be that parental rejection leads to symptoms of anxiety and depression via the internalization of negative beliefs about oneself as worthless or unlovable (e.g., Beck, 2011). The association between parental overcontrol, hypomanic activation, and psychoticism has been less well studied, though some promising research links deficits in self-regulation with increased hypomanic activation and maladaptive behaviors (Claes et al., 2010). In the case of overcontrol, hypomanic activation and psychoticism could result from the adoption of the norm that intense emotional and cognitive experiences are not acceptable and the internalization of beliefs that one is

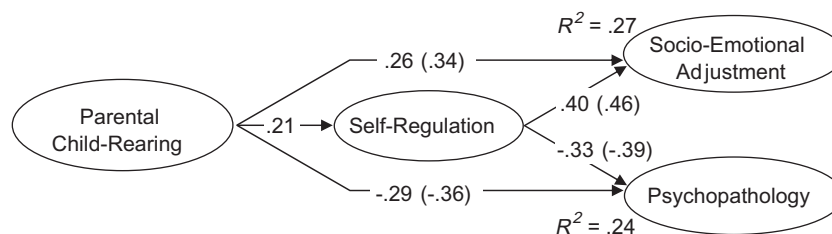


Fig. 1. Path diagram demonstrating that the relationship between parental child-rearing and psychopathology and adjustment is partially mediated by self-regulation. Parenthetical values indicate zero-order correlations. The model supported partial mediation. All path coefficients were statistically significant ($p < .05$), as were the indirect effects, when examined using the Sobel (1982) test.

incompetent and powerless. This study has implications for both basic and translational research related to these core clinical features; future research should work to elucidate the processes by which parental child-rearing affects adjustment/psychopathology and to inform the development of clinical interventions.

It is well known that parents' interactions with their young children set the stage for children's development of self-regulation across behavioral, cognitive, and affective domains (e.g., Bronson, 2000). Research has clearly linked adaptive parental child-rearing practices with improved self-regulation (Eisenberg et al., 2010; Morris et al., 2007), while less effective self-regulation has also been associated with psychopathology (Eftekhari, Zoellner, & Vigil, 2009; Eisenberg et al., 2010). In the context of longitudinal studies conducted during childhood and adolescence, self-regulation has also been demonstrated to mediate the relationship between parental child-rearing and interpersonal difficulties as well as internalizing and externalizing psychopathology (Eiden, Edwards, & Leonard, 2007; Eisenberg et al., 2005; Kim & Cicchetti, 2010). The present investigation not only supports the mediational role of self-regulation in the relationship between parental child-rearing and socio-emotional adjustment/psychopathology, but also extends this literature into early adulthood.

This study incorporated several conceptual and methodological strengths. Foremost, prior studies have tended to underutilize theory in determining the choice of adjustment variables to examine, often focusing on non-specific outcomes. In contrast, we used a self-regulation framework (Hoerger et al., 2011) to select adjustment variables that were both relevant and specific, contributing toward public health objectives outlined in the NICHD (2001) report. Secondly, dependent measures covered a broad range of theoretically-meaningful constructs. Thus, the study incorporated both breadth and depth, while being grounded in theory.

Several important limitations of the study can be noted. First, our methodology relied upon self-report measures rather than informant or observational ratings of parenting behaviors and structured clinical interviews to assess adjustment and psychopathology. Future multi-method studies can help to address potential limitations involving self-report response sets or auto-correlation. Second, findings are based on cross-sectional analyses and any causal inferences drawn about the association between parental child-rearing practices and adult socio-emotional adjustment is purely theoretical in absence of longitudinal investigations. Finally, the aim of this paper was to investigate the basic relationships between parental child-rearing and adjustment in early adulthood. As such, this study was unable to incorporate additional important mediators and moderators of these relationships (e.g., variables assessing genetic contributions to these relationships) or to focus on a complimentary profile of strengths and achievement rather than psychopathology.

5. Conclusions

In summary, in the context of a retrospective cohort study, recalled parental warmth, rejection, and overcontrol were predictably related to self-regulation during early adulthood. In addition, parental warmth was associated with improved interpersonal and academic adjustment, while parental rejection was most closely related to internalizing clinical presentations like anxiety, depression, and somatization, and parental overcontrol was most aligned with increased hypomanic activation and psychoticism. Lastly, self-regulation was found to partially mediate the relationship between parental child-rearing and adjustment/psychopathology.

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