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The Cascade of Chaos: From Early Adversity to Interpersonal Aggression

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We developed a cascade model to reconstruct the hypothesized developmental progression from (a) increased resource instability during childhood to (b) decreased maternal sensitivity during childhood to (c) social vulnerability cognitive schemata to (d) faster Life History strategies to (e) decreased behavioral regulation to (f) more pronounced "Dark Triad" personalities to (b) higher levels of interpersonal aggression in adulthood. The hypothesized cascade model also evaluated the cross-cultural generality of this theoretically specified developmental progression across a sampling of different societies: (a) the United States of America ($N = 144$), (b) Mexico ($N = 118$),

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(c) Brazil ($N = 1091$, distributed across 3 data collection sites), (d) Sweden ($N = 144$), and (e) the United Kingdom ($N = 260$). Out of 21 interactive tests of the cross-cultural robustness of the main model parameters, only 5 reached statistical significance, and were relatively small in magnitude compared with their main effects. In no case did the magnitude and direction of the interaction completely reverse that of the corresponding main effect of the predictor, but merely either augmented or attenuated it somewhat across the affected study sites. We conclude that the results generally supported both the configural and metric invariance of the cascade model to a relatively high, albeit imperfect, degree.

Public Significance Statement
This cross-cultural study tested the generality of a developmental sequence leading from childhood harshness and unpredictability, through various theoretically specified stages, to adult interpersonal aggression.

Keywords: early adversity, Life History strategy, behavioral regulation, Dark Triad traits, interpersonal aggression

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The purpose of this study was to reconstruct, model, and estimate a developmental sequence from retrospective self-report, starting with the experience of early environmental adversity and ultimately leading to the involvement in interpersonal aggression. As illustrated by Figure 1, the multiple-mediation cascade model hypothesized a sequence of successive stages of development based on Life History (LH) theory from (a) increased resource instability during childhood to (b) decreased maternal sensitivity during childhood to (c) social vulnerability cognitive schemata to (d) faster LH strategies to (e) decreased behavioral regulation to (f) more antagonistic social schemata to (g) higher levels of involvement in interpersonal aggression during adulthood. This study does not address the victimization dimension of aggressive interactions, but only focuses on perpetration.

In addition, the present study attempts to establish the cross-cultural robustness of these findings by examining the degree of structural and metric invariance of both measurement and structural models across various data collection sites in the United States of America, Mexico, Brazil, Sweden, and the United Kingdom. Thus, it explores how chaotic early environments replicate themselves intergenerationally by influencing developmental, emotional, psychological, and behavioral characteristics of children exposed to early adversity. An unfortunate effect of such exposure is that, for some, it creates conditions conducive to the development of similar patterns of behavior, thereby facilitating intergenerational transmission of chaotic patterns of behavior.

Description of Major Constructs

LH theory describes the strategic allocation of bioenergetic and material resources in service of survival and reproduction in each phase of life (Black, Figueredo, & Jacobs, 2018; Figueredo, Patch, & Ceballos, 2015). LH strategies range from fast to slow, where slow strategies are reflected in characteristics indicating greater somatic and parental effort relative to mating effort. In contrast, fast strategies are characterized by greater mating and intrasexually competitive effort relative to somatic and parental effort.

Individual plasticity in the context of LH theory is mainly shaped by specific dimensions of environmental risk: harshness and unpredictability (Ellis, Figueredo, Brumbach, & Schlomer, 2009). Rates of morbidity/mortality and resource scarcity characterize environmental harshness, while variation of harshness over time and space characterize instability. Environmental unpredictability, particularly for juveniles, accelerates developmental timing and maturation, because unpredictability in the environment poses risks to survival and reproduc-

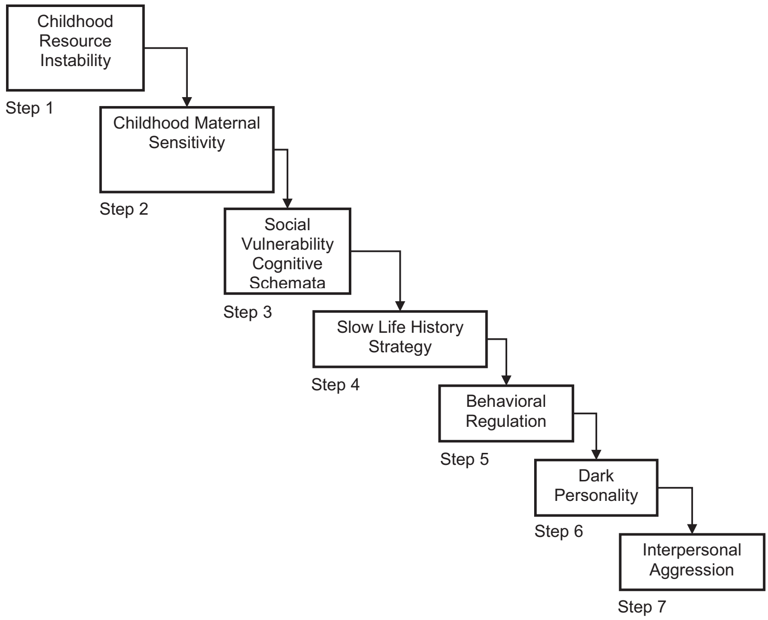

Figure 1. The multiple-mediation cascade model hypothesized, showing the sequence of successive stages of development.

tion. Accelerating development to become reproductive increases fitness in the face of such risks. Based on the LH theoretical framework, Step 1 in the cascade model assessed environmental instability by measuring economic resource instability, including unpredictable access to food, clothing, and other basic necessities. Step 2 assessed measured maternal sensitivity, as environmental unpredictability creates competing interests for parents raising offspring under these conditions (Belsky, Schlomer, & Ellis, 2012). Given the significant impact of parental investment on offspring developmental outcomes (Cabeza de Baca & Ellis, 2017; Cabeza de Baca, Figueredo, & Ellis, 2012; Cabeza de Baca, Sotomayor-Peterson, Smith-Castro, & Figueredo, 2014; Cabeza de Baca, Sotomayor-Peterson, & Figueredo, 2017; Cabeza de Baca, Wahl, Bartnett, Figueredo, & Ellis, 2016; Sotomayor-Peterson, Cabeza de Baca, Figueredo, & Smith-Castro, 2012), our cascade model measured maternal sensitivity along three dimensions following Belsky et al.'s (2012) work: (1) supportive presence, (2) respect for autonomy, and (3) hostility.

Evolutionary psychologists apply LH to interpret the shared variance of a variety of personality, cognitive, emotional, and behavioral traits that are impacted by environmental risk factors (Figueredo et al., 2006, 2007). Step 3 in the cascade assessed internalized schemata of social vulnerability. Assessing how individuals internalize external events is an important argument in favor of measuring psychological LH characteristics in addition to biodemographic ones (Black, Figueredo, & Jacobs, 2017; Black, Patch, Figueredo, & Jacobs, 2019). An evolutionary analysis of the development of social deviance has elucidated the mechanisms by which social and sexual environments selecting for slow LH lead to the internalizing of *convergent* or *mutualistic* social schemata, whereas those selecting for fast LH lead to the internalizing of *divergent* or *antagonistic* social schemata, as working models for their social and sexual relationships (Figueredo & Jacobs, 2010). Based on the operationalization of environmental instability, we assessed three dimensions of social vulnerability cognitive schemata in Step 3: (1) abandonment/instability, (2) mistrust/abuse, and (3) vulnerability to harm (Young, 1999).

According to the theoretical dynamics of LH theory (Ellis et al., 2009), high childhood re-

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source instability, low childhood maternal sensitivity, and the consequent development of a social vulnerability social–cognitive schema should contribute to the development of a faster LH strategy to be expressed in adulthood, which constitute Step 4. LH strategy is conceived of as a psychometric composite of three major constituents (the Super-K Factor; Figueredo, Vásquez, Brumbach, & Schneider, 2004, 2007): (1) the K-Factor, representing slow LH strategy, as measured psychometrically by a set of convergent behavioral and cognitive indicators; (2) the Covitality Factor, indicating the higher mental and physical functioning reflective of increased received parental and invested somatic effort; and (3) the Personality Factor (also known as the General Factor of Personality or GFP), constructed from the constituent Big Five (Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Emotional Stability, which is the inverse of Neuroticism).

Behavioral dysregulation constitutes Step 5 the sequence within the cascade model. Resource instability in childhood appears to decrease behavioral regulation in adulthood (Griskevicius et al., 2013; Griskevicius, Tybur, Delton, & Robertson, 2011; Hackman, Farah, & Meaney, 2010; Hill, Prokosch, DelPriore, Griskevicius, & Kramer, 2016). Detecting environmental instability in childhood decreases one's sense of control, which has been shown to mediate the relationship between environmental conditions and impulsive behavior (Mittal & Griskevicius, 2014). Impulsive behavior developed in adolescence increases the risk of aggression, crime, and other reckless behaviors (Ellis et al., 2012).

Dark Triad (DT) personalities tend to be more common among faster LH strategists (Book & Quinsey, 2004; Jonason, Icho, & Ireland, 2016; Patch & Figueredo, 2017; Schmitt et al., 2017). DT personalities apparently constitute psychological adaptations that make individuals more capable of achieving their antagonistic ends. For example, these traits have been linked to exploitative mating styles (Jonason, Li, Webster, & Schmitt, 2009), social dominance and nonconformity (Figueredo & Jacobs, 2010), and aggression (Keller et al., 2014). In Step 6 of the sequence of the cascade model we examine antagonism, the core of the DT traits (Figueredo, Patch, Perez-Ramos, & Cruz, 2018; Jones & Figueredo, 2013).

There are ongoing debates about whether or not psychopathy, Narcissism, and Machiavellianism are different personality traits (Figueredo, Gladden, Sisco, Patch, & Jones, 2015; Jonason et al., 2016; Paulhus & Williams, 2002), and here we refer to the DT personalities as individuals who have a core of callousness and an antagonistic manner of interacting with the world (Figueredo et al., 2018). While the DT personalities do have a common core of callousness (Jonason et al., 2009; Jones & Figueredo, 2013; Jones & Paulhus, 2011), it is generally accepted that they have some unique features (Heym et al., 2019). Psychopaths are characterized by unplanned, erratic, impulsive behavior (Jones & Paulhus, 2011), while Machiavellians maintain an ability to plan for the long-term (Jonason et al., 2016; Jones & Paulhus, 2011; Paulhus & Williams, 2002). Narcissists are characterized by grandiose sense of self and extreme entitlement (Jones & Paulhus, 2011).

The Dark Inventory (DI; Figueredo et al., 2018) represents a theoretical restructuring that reorganizes the variance among these DT traits into three constructs: (1) antagonistic social schemata; (2) mutualistic social schemata; and (3) emotional and cognitive lability. Here, the antagonistic construct refers to the DT's common core of callousness and lack of emotional empathy. The functional opposite of this is mutualistic, which refers to the ability to form attachments and have concern for other individuals. Lability refers to these individuals' inability to regulate their behavior (Figueredo et al., 2018). Thus, the DT traits have been associated with a range of direct and indirect interpersonal aggressive behaviors (e.g., Heym et al., 2019), which form the final outcome (Step 7) of the Cascade model.

If an antagonistic social schema is an adaptation, it should be at least partially heritable (Croston, Branch, Kozlovsky, Dukas, & Pravosudov, 2015). The heritable nature of psychopathy (Beitchman et al., 2012; Millon, Simonsen, Birket-Smith, & Davis, 2002) and LH strategy (Figueredo et al., 2006) might have been selected for the benefits of deviant behaviors, such as social cheating (Book & Quinsey, 2004). These adaptations are identifiable, for example, in that psychopaths have dysregulated autonomic responses, fail to recognize fear stimuli, and develop inappropriate responses to these

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stimuli (Dadds et al., 2012) Their diminished fear response, underpinned by underactivity or dysregulation in the limbic system (Blair, 2003; Kiehl, 2006), prevents them from learning to avoid dangerous stimuli, and has been argued to underpin the aggressive and violent behavior in psychopathy (Blair, 2003). From a developmental viewpoint, children as young as 7 years demonstrate callous-unemotional (CU) traits linked to lack of guilt, empathy and concern for others, as well as limbic dysregulation (Dadds et al., 2012; Viding, Blair, Moffitt, & Plomin, 2005), all of which are thought to pose a developmental risk for psychopathy in adulthood (Viding et al., 2005). These traits are strongly heritable (around 67 or 81% when coupled with conduct disorder; Dadds et al., 2014). While environmental factors such as abuse and neglect can cause aggression and conduct problems, not all children with psychopathic tendencies have experienced any abuse (Dadds et al., 2012). However, despite genetic influences, psychopathy has a greater observed prevalence in unfavorable environments (Viding et al., 2014). Thus, our developmental cascade model examines levels of instability in the childhood environment and the resulting psychological risk factors, and fast LH strategy as risk factors for the development of DT traits and an antagonistic social schemata and proclivity to be involved in violent interactions, which constitutes Step 7 in our model. The current study conceptualized this broadly across five different manifestations of aggression toward both same-sex and opposite sex targets (Figueredo et al., 2018): (1) Coercive Control, (2) Psychological Abuse, (3) Physical Abuse, (4) Escalated (Life Threatening) Violence, and (5) Sexual Abuse. Consistent with one of the major goals of evolutionary psychology, which is to identify and document human universals, we also subjected this cascade model to tests of cross-cultural robustness across five different contemporary societies.

Overview of Study

In summary, the present study was designed to reconstruct, model, and estimate the hypothesized developmental progression from (1) increased resource instability during childhood to (2) decreased maternal sensitivity during childhood to (3) social vulnerability cognitive schemata to (4) faster LH strategies to (5) decreased behavioral regulation to (6) more pronounced "Dark Triad" personalities to (7) higher levels of interpersonal aggression. Further, the present study was designed to evaluate the cross-cultural generality of this hypothesized developmental progression across a sampling of different societies: (1) the United States of America; (2) Mexico; (3) Brazil; (4) Sweden; and (5) the United Kingdom.

Method

Participants

University students were recruited at the following institutions, the demographics listed in Table 1: (a) University of Arizona in the United States; (b) Umeå Universitet in Sweden; (c) the Autonomous Metropolitan University of Mexico; (d) Nottingham Trent University in the United Kingdom; and (e) the Universidade de São Paulo, Universidade Federal do Rio Grande do Norte, and Universidade Federal do Rio Grande do Sul in Brazil. The Brazilian samples were broken down by student place of origin within Brazil in our analyses, rather than the site of their data collection. For the final composite sample size of N = 1,660, after excluding all cases

Table 1
Demographics Across Five Cross-Cultural Sites

Demographic	Brazil	Mexico	Sweden	United Kingdom	United States
N	1,091	118	135	260	144
Age (*M*)	32.8	21.3	25.7	19.6	18.9
Age (*SD*)	10.6	2.11	5.1	2.5	1.85
Age range	18–74	18–32	19–27	18–45	18–31
Female *n*	757 (69%)	93 (78%)	85 (57%)	233 (86%)	99 (69%)
Male *n*	333 (31%)	25 (22%)	51 (34%)	27 (14%)	44 (31%)

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with missing data, a post hoc power analysis revealed probabilities of Type II Error of $p <$ .01 for $r = .2$, $r = .3$, and $r = .5$.

Participants were recruited primarily from introductory psychology classes, in which case site administrators were invited to classrooms to announce the project and instruct the students on how to find the data collection website. Participants from the University of Arizona could also sign up through their respective Psychology department's subject pool in exchange for course or extra credit. The Swedish and British research teams used a raffle system to recruit students from all disciplines. Following the University of Arizona policy regarding raffles for subject recruitment, the recruitment materials abroad did not reference any compensation. In Brazil, research participants are prohibited from receiving any compensation. Consent materials included information about the raffle and stated that participation was not required to participate in the drawing; additionally, students were provided with a way to decline participation but enter the drawing. For all five countries sampled, we also followed all other pertinent Institutional Review Board (IRB) regulations for the protection of human research participants.

Procedure

For the following three samples, the study was conducted online using the University of Arizona's Qualtrics (Provo, UT) online data collection system: (1) University of Arizona, (2) University of Umeå, and (3) Autonomous University of Mexico. For the British sample (i.e., Nottingham Trent University), data were collected using an online data collection system similar to Qualtrics, called the Bristol Online Survey. For the Brazilian samples, data were collected online using SurveyMonkey, Inc. (San Mateo, CA).

Participants provided informed consent and completed the questionnaires via secure data collection software. All research participants received unique subject IDs that do not identify them as individuals. Participants across the five countries (Brazil, Mexico, Sweden, United Kingdom, and United States) completed all the questionnaires listed below.

Measures

All questionnaires were translated and culturally adapted to each country's language by bilingual researches using the standard back-translation procedure for cross-cultural research (Brislin, 1970). As all of the measures used have been published previously, we restrict the present treatment to a listing of scales plus the citations for each, leaving the full descriptions of each measure to Online Supplemental Materials, Appendix A:

- **Environmental Instability**

  Early Environment Questionnaire (Black & Gable, 2012).

  Young Schema Questionnaire—Abbreviated Short Form (YSQ-S2; Figueredo et al., 2018; Young & Brown, 1999).

- **Higher-Order LH (Super-K)**

  Mini-K Short Form (Figueredo et al., 2006). mc>*Rand 36 Item Health Survey: Version 1* (Ware & Sherbourne, 1992).

  Ten-Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003).

- **Behavioral Regulation**

  The Behavioral Regulation Scale (BRIEF; Gioia, Isquith, Retzlaff, & Espy, 2002).

- **DT Personalities**

  The Dark Inventory (DI; Figueredo et al., 2018).

- **Interpersonal Aggression (IPA).**

  Interpersonal Relations Rating Scale (IRRS; Figueredo et al., 2018; Figueredo et al., 2018).

Psychometric reliabilities and validities for each of these scales is presented in Table 2, which displays the Cronbach's αs and part-whole correlations (unit-weighted factor loadings) for all the major constructs used in these analyses. All these measurement model parameters were deemed to be psychometrically acceptable.

Because of the high degree of cross-cultural invariance among the results of these measurement models, the ones presented here are aggregated statistics, with the disaggregated

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Table 2
Cronbach's αs and Part-Whole Correlations (Unit-Weighted Factor Loadings) for the Indicators of Childhood Resource Instability (RESINSTAB), Childhood Maternal Sensitivity (MATSEN), Young Schema Questionnaire (YSQ), Slow LH Strategy Factor (SUPER-K), Behavioral Regulation Scales of the BRIEF-A (BEHREG), Dark Inventory Short Form for "Dark Triad" Traits (DI-SF), Same-Sex Interpersonal Relations Ratings Scale (IRRS-S), Opposite-Sex Interpersonal Relations Ratings Scale (IRRS-O), and General Interpersonal Aggression (IPA)

Indicator variable	α	Unit-weighted factor
Childhood Resource Instability (RESINSTAB)		
HARSH-CHILD	.745	0.916*
INSTA-CHILD	.732	0.916*
Childhood Maternal Sensitivity (MATSEN)		
MATSEN-CHILD	.816	1.000
Social Vulnerability Schemata–Young Schema Questionnaire (YSQ)		
YSQ-CHILD AB	.910	0.802*
YSQ-CHILD MA	.907	0.856*
YSQ-CHILD VH	.848	0.856*
Young Adult Slow Life History Strategy Factor (SUPER-K)		
K-FACTOR	.802	0.729*
COVITALITY	.846	0.730*
PERSONALITY	.626	0.819*
Behavioral Regulation Scales of the BRIEF-A (BEHREG)		
EMOTIONAL CONTROL	.932	0.881*
INHIBIT	.815	0.909*
SELF MONITOR	.863	0.898*
SHIFT	.817	0.892*
Dark Inventory–Short Form (DI-SF)		
ANTAGONISTIC	.759	0.787*
MUTUALISTIC	.557	−0.712*
LABILITY	.598	0.746*
Same-Sex Interpersonal Relations Ratings Scale (IRRS-S)		
SAME-SEX CONTROL	.893	0.922*
SAME-SEX PSYCHO	.835	0.742*
SAME-SEX PHYSICAL	.879	0.917*
SAME-SEX ESCALATED	.977	0.920*
SAME-SEX SEXUAL	.936	0.919*
Opposite Sex Interpersonal Relations Ratings Scale (IRRS-O)		
OPPOSITE SEX CONTROL	.876	0.905*
OPPOSITE SEX PSYCHO	.832	0.754*
OPPOSITE SEX PHYSICAL	.879	0.894*
OPPOSITE SEX ESCALATED	.973	0.904*
OPPOSITE SEX SEXUAL	.898	0.903*
General Interpersonal Aggression (IPA)		
SAME-SEX IRRS	.974	0.987*
OPPOSITE SEX IRRS	.967	0.987*

* $p < .05$.

equivalents by study site presented in Online Supplemental Materials, Appendix B.

Statistical Analyses

All univariate and multivariate analyses were performed using SAS 9.4 (SAS Institute Inc., 2015) and Unimult 2 (Gorsuch, 2016). Using SAS PROC STANDARD and DATA, unit-weighted common factor scales (Gorsuch, 1983) were estimated as the means of the standardized scores for all nonmissing subscales on each factor (Figueredo, McKnight, McKnight, & Sidani, 2000). Using SAS PROC CORR, we also computed the Cronbach's αs, the covariance matrices of the subscales, and the part-whole correlations of the subscales with the unit-weighted factor scales. All the unit-weighted factor scales estimated were entered as manifest variables for causal analysis within a cascade model framework (Davis, Guggenheim, Figueredo, Wright, & Locke, 2007; Demetriou, Christou, Spanoudis, & Platsidou, 2002; Figueredo & Gorsuch, 2007; Guggenheim, Davis, & Figueredo, 2007; Mouyi, 2006).

The cascade model was constructed as a series of hierarchical multiple regressions, using UniMult 2, in which each prior criterion variable was entered as the first predictor variable for each successive equation. This had the function of statistically controlling for all indirect effects of the predictor variables through each prior criterion, so that each regression model would be limited to the estimation of the direct effects of each successive set of predictors without confounding by the indirect effects through prior the criterion variables. Thus, if X1 predicted Y1 and Y1 then predicted Y2, then the second equation would be able to estimate the direct effect of X1 on Y2 while statistically controlling for its indirect effect on Y2 through Y1. Thus, the theoretically determined sequence of criterion variables was specified as

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follows, along with the expected direction of each successive effect given in parentheses: Resource Instability during Childhood (-)→ Maternal Sensitivity during Childhood (-)→ Social Vulnerability Cognitive Schemata (-)→ Super-K (Slow LH) Factor (+)→ Behavioral Regulation (-)→ Dark Inventory of "Dark Triad" Traits (+)→ Interpersonal Aggression.

To test for the cross-cultural consistency of these effects, a system of orthogonal contrasts was constructed to operationalize the differences between the different study populations. The contrasts were constructed based on simple geography rather than the environmental factors of "harshness and unpredictability" (Ellis et al., 2009) that are theoretically predicted to influence LH evolution and development. These latter factors are measured explicitly in the model by individual-level constructs and are not encapsulated in the system of orthogonal contrasts. These contrasts were intentionally designed to be agnostic with respect to our main hypotheses in view of the fact that although our sampling of *individuals* was extensive, our sampling of different *cultures* (only five different national polities) was hardly sufficient to support any generalizable inferences regarding the possible *causes* of the cross-cultural differences. Even had we explicitly based our contrasts on comparing cultures with high- to low-harshness or unpredictability, our sample size of *cultures* would have been inadequate to make such causal attributions in a way that would be generalizable to other cultures not sampled.

The first contrast (C1) compared the societies sampled in the Americas with those sampled in Europe. The second contrast (C2) compared North America (United States and Mexico) to South America (Brazil). The next two contrasts were North-South comparisons within each continent. The third contrast (C3) compared the United States to Mexico, within North America. The fourth contrast (C4) compared Sweden to the United Kingdom, within Europe. The remaining four contrasts compared subnational regions within Brazil. The fifth contrast (C5) compared Northern Brazil (Acre, Amapá, Amazonas, Pará, Rondônia, Roraima, Tocantins, Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí Rio Grande do Norte, and Sergipe) to Southern Brazil (Distito Federal, Goiás, Mato Grosso, Mato Grosso do Sul, Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo, Paraná, Rio Grande do Sul, and Santa Catarina). The sixth contrast (C6) compared the North of Brazil (Acre, Amapá, Amazonas, Pará, Rondônia, Roraima, Tocantins) to the Northeast of Brazil (Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí Rio Grande do Norte, and Sergipe). The seventh contrast (C7) compared the Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, and São Paulo) to the remainder of the Southern regions (Distito Federal, Goiás, Mato Grosso, Mato Grosso do Sul, Paraná, Rio Grande do Sul, and Santa Catarina). The eighth contrast (C8) compared the Center West (Distito Federal, Goiás, Mato Grosso, and Mato Grosso do Sul) to the furthest South (Paraná, Rio Grande do Sul, and Santa Catarina).

These orthogonal contrasts were entered first as main effects, to test and adjust for cross-cultural differences in baselines for each criterion variable. Interaction terms were then constructed for each predictor variable (including the prior criterion variables) within each regression to assess the degree of conditionality of the effects of each predictor upon the sites sampled. This procedure enabled us to estimate of the degrees of cross-cultural consistency of each effect within the model by comparing the magnitudes and direction of the interactions to those of the main effects.

To statistically protect against alpha slippage (inflation of the Type I Error rate), each set of contrasts and contrast interactions was assessed setwise by an omnibus protective *F*-ratio. Thus, if this omnibus test was not statistically significant for any given set of contrasts or contrast interactions, the individual terms within each set were not examined for statistical significance and the entire set was considered nonsignificant as a whole. This controlled for excessive alpha slippage by reducing the functional number of significance tests (Cohen & Cohen, 1983).

Results

Magnitudes and directions of statistically significant effects are reported below in parentheses, operationalized as either the multiple correlation coefficients (R) or the semipartial correlation coefficients (sR), and followed by the probability under the null hypothesis (e.g., $p < .05$). The magnitudes of certain nonsignificant protective omnibus tests are also reported to highlight their relatively small effect sizes. The full details of the series of hierarchical multiple regressions (Cascade Equations 1–7) used to operationalize the structural hypotheses and test for cross-cultural consistency, including all statistically nonsignificant effects are reported in Tables C1–C7 in Online Supplemental Materials, Appendix C.

Instability of Childhood Economic Resources (Cascade Equation 1, $R = .26$, $p = .00$)

The omnibus F-ratio for the set of main effects of the orthogonal contrasts for cross-cultural sites was statistically significant ($R = .26$, $p = .00$). This indicates that it was appropriate to evaluate and interpret the statistical significance of the individual terms within that set as representing baseline differences in the Instability of childhood economic resources across certain sites. Four individual contrasts were found statistically significant, indicating that the baseline level of Childhood Resource Instability was: (C1) higher in the Americas than in Europe ($sR = .19$, $p = .00$); (C2) lower in North than South America ($sR = -.13$, $p = .00$); (C3) lower in the United States than in Mexico ($sR = -.09$, $p = .00$); and (C7) higher in the Southeast than in other Southern regions of Brazil ($sR = .06$, $p = .01$).

Maternal Sensitivity During Childhood (Cascade Equation 2, $R = .24$, $p = .00$)

The main effect of childhood Resource Instability upon childhood Maternal Sensitivity was statistically significant and negative ($sR = -.21$, $p = .00$). The omnibus F-ratio for the set of main effects of the orthogonal contrasts for cross-cultural sites was not statistically significant ($R = .05$, $p = .74$), suggesting that this variable was statistically invariant among study sites.

However, the omnibus F-ratio for the set of interactive effects of the orthogonal contrasts for cross-cultural study sites with childhood Resource Instability was statistically significant ($R = .12$, $p = .00$), permitting us to safely evaluate and interpret the individual interaction terms. Two interaction terms between the contrasts and childhood Resource Instability were found statistically significant, indicating that the effect of childhood Resource Instability on childhood Maternal Sensitivity was: (C1) higher in the Americas than in Europe ($sR = .09$, $p = .00$); and (C2) lower in North than South America ($sR = -.05$, $p = .04$). However, these effects were both smaller in absolute magnitude than the main effect of childhood Resource Instability so that in neither case were the directions of that main effect reversed, just either somewhat augmented or attenuated in the affected sites.

Social Vulnerability Cognitive Schemata (Cascade Equation 3, $R = .46$, $p = .00$)

In line with the model, the main effect of childhood Maternal Sensitivity upon childhood Social Vulnerability Cognitive Schemata was statistically significant and negative ($sR = -.35$, $p = .00$), whereas the main effect of childhood Resource Instability upon childhood Social Vulnerability Cognitive Schemata was statistically significant and positive ($sR = .10$, $p = .00$).

The omnibus F-ratio for the set of main effects of the orthogonal contrasts for cross-cultural sites on childhood Social Vulnerability Cognitive Schemata was statistically significant ($R = .28$, $p = .00$). Three contrast main effects were statistically significant, indicating that the baseline level of childhood Social Vulnerability Cognitive Schemata was: (C1) lower in the Americas than in Europe ($sR = -.21$, $p = .00$); (C2) higher in North America than South America ($sR = .13$, $p = .00$); and (C4) lower in Sweden than in the United Kingdom ($sR = -.12$, $p = .00$).

Nevertheless, the omnibus F-ratios for the sets of interactive effects of the orthogonal contrasts for cross-cultural sites with both childhood Maternal Sensitivity ($R = .06$, $p = .48$) and childhood Resource Instability ($R = .05$, $p = .62$) were not statistically significant for Social Vulnerability Cognitive Schemata showing statistical invariance across study sites for the effects of these two predictor variables.

Super-K (Slow LH) Factor (Cascade Equation 4, $R = .46$, $p = .00$)

As expected, the main effect of childhood Social Vulnerability Cognitive Schemata upon

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adult Slow LH Strategy, as measured by the Super-K Factor, was statistically significant and negative ($sR = -.37$, $p = .00$), whereas the main effect of childhood Maternal Sensitivity upon adult Slow LH Strategy was statistically significant and positive ($sR = .21$, $p = .00$). As specifically predicted by LH theory, the main effect of childhood Resource Instability upon adult Slow LH Strategy was statistically significant and negative ($sR = -.08$, $p = .00$).

The omnibus F-ratio for the set of main effects of the orthogonal contrasts for cross-cultural sites upon adult Slow LH Strategy was statistically significant ($R = .10$, $p = .01$). Two contrast main effects were statistically significant, indicating that the baseline level of adult Slow LH Strategy was: (C3) higher in the United States than in Mexico ($sR = .07$, $p = .00$); and (C7) higher in the Southeast than in other Southern regions of Brazil ($sR = .06$, $p = .01$).

The omnibus F-ratios for the sets of interactive effects of the orthogonal contrasts for cross-cultural sites with childhood Social Vulnerability Cognitive Schemata ($R = .08$, $p = .17$), childhood Maternal Sensitivity ($R = .07$, $p = .35$), and childhood Resource Instability ($R = .07$, $p = .17$) were not statistically significant for adult Slow LH Strategy, suggesting statistical invariance across study sites for the effects of these three predictor variables.

Behavioral Regulation (Cascade Equation 5, $R = .60$, $p = .00$)

Also as expected, the main effect of adult Slow LH Strategy, as measured by the Super-K Factor, upon adult Behavioral Regulation was statistically significant and positive ($sR = .47$, $p = .00$), and the main effect of childhood Social Vulnerability Cognitive Schemata upon adult Behavioral Regulation was statistically significant and negative ($sR = -.31$, $p = .00$). However, the main effects of childhood Maternal Sensitivity and Resource Instability upon adult Behavioral Regulation were not statistically significant.

The omnibus F-ratio for the set of main effects of the orthogonal contrasts for cross-cultural sites upon adult Behavioral Regulation was statistically significant ($R = .16$, $p = .00$). Three contrast main effects were statistically significant, indicating that the baseline level of adult Behavioral Regulation was: (C1) lower in the Americas than in Europe ($sR = -.01$, $p = .05$); (C2) higher in North America than South America ($sR = .12$, $p = .00$); and (C4) higher in Sweden than in the United Kingdom ($sR = .06$, $p = .00$).

The omnibus F-ratio for the set of interactive effects of the orthogonal contrasts for cross-cultural sites with adult Slow LH Strategy was also statistically significant ($R = .08$, $p = .03$). Two interaction terms between the contrasts and adult Slow LH Strategy were found statistically significant, indicating that the predicted effect of adult Slow LH Strategy on adult Behavioral Regulation was: (C1) higher in the Americas than in Europe ($sR = .05$, $p = .01$); and (C2) lower in the United States than in Mexico ($sR = .12$, $p = .03$). However, these effects were both smaller in absolute magnitude than the main effect of adult Slow LH Strategy so that in neither case were the directions of that main effect reversed, just either somewhat augmented or attenuated.

As with adult Slow LH Strategy, the omnibus F-ratios for the sets of interactive effects of the orthogonal contrasts for cross-cultural sites with childhood Social Vulnerability Cognitive Schemata ($R = .06$, $p = .34$), childhood Maternal Sensitivity ($R = .06$, $p = .45$), and childhood Resource Instability ($R = .05$, $p = .57$) were not statistically significant for adult Behavioral Regulation. This indicates that the effects of these three predictor variables were statistically invariant across study sites.

Dark Inventory of DT Traits (Cascade Equation 6, $R = .69$, $p = .00$)

Also as expected, the main effect of adult Behavioral Regulation upon adult DT Traits was statistically significant and negative ($sR = -.55$, $p = .00$), the main effect of adult Slow LH Strategy upon adult DT Traits was statistically significant and negative ($sR = -.35$, $p = .00$), and the main effect of childhood Social Vulnerability Cognitive Schemata upon adult DT Traits was statistically significant and positive ($sR = .13$, $p = .00$). However, the residual main effect of childhood Maternal Sensitivity upon adult DT Traits and the residual main effect of childhood Resource Instability upon adult DT Traits were not statistically significant. These two latter were instead transmitted as

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indirect effects through adult Behavioral Regulation and adult Slow LH Strategy.

The omnibus F-ratio for the set of main effects of the orthogonal contrasts for cross-cultural sites upon adult DT Traits was statistically significant (R = .11, p = .00). Two contrast main effects were statistically significant indicating that the baseline level of adult DT Traits was: (C2) lower in North than South America (sR = −.06, p = .00); and (C4) lower in Sweden than in the United Kingdom (sR = −.09, p = .00).

Moreover, the omnibus F-ratio for the set of interactive effects of the orthogonal contrasts for cross-cultural sites with adult Slow LH Strategy was statistically significant (R = .08, p = .02). Only one of the interaction terms between the contrasts and adult Slow LH Strategy was found statistically significant: (C4) indicating a higher predicted effect of adult Slow LH Strategy on adult Behavioral Regulation in Sweden than in the United Kingdom (sR = −.04, p = .01). However, this effect was smaller in absolute magnitude than was the main effect of adult Slow LH Strategy, so that the direction of that main effect was not reversed, just either somewhat augmented or attenuated.

Nevertheless, the omnibus F-ratios for the sets of interactive effects of the orthogonal contrasts for cross-cultural sites with adult Behavioral Regulation (R = .07, p = .06), childhood Social Vulnerability Cognitive Schemata (R = .05, p = .57), childhood Maternal Sensitivity (R = .06, p = .15), and childhood Resource Instability (R = .05, p = .59) were not statistically significant for adult DT Traits. This indicates that the effects of these three predictor variables were statistically invariant across study sites.

Interpersonal Aggression (Cascade Equation 7, R = .41, p = .00)

Finally, as expected, the main effect of adult DT Traits upon adult Interpersonal Aggression was statistically significant and positive (sR = .28, p = .00), the main effect of adult Behavioral Regulation upon Interpersonal Aggression was statistically significant and negative (sR = −.18, p = .00), and the main effect of childhood Resource Instability upon Interpersonal Aggression was statistically significant and positive (sR = .08, p = .00). However, the residual main effects of adult Slow LH Strategy, childhood Social Vulnerability Cognitive Schemata and Maternal Sensitivity upon adult Interpersonal Aggression were not statistically significant. These three latter were instead transmitted as indirect effects through adult DT Traits and adult Behavioral Regulation.

The omnibus F-ratio for the set of main effects of the orthogonal contrasts for cross-cultural sites upon adult Interpersonal Aggression was statistically significant (R = .09, p = .04). One contrast main effect was statistically significant: (C2) indicating a higher baseline level of adult Interpersonal Aggression in North than South America (sR = .06, p = .01).

Moreover, the omnibus F-ratio for the set of interactive effects of the orthogonal contrasts for cross-cultural sites with childhood Social Vulnerability Cognitive Schemata was statistically significant (R = .11, p = .01). Only one of the interaction terms between the contrasts and childhood Social Vulnerability Cognitive Schemata was found statistically significant: (C2) indicating a lower predicted effect of childhood Social Vulnerability Cognitive Schemata on adult Interpersonal Aggression in North than in South America (sR = −.08, p = .00). Although the main effect of childhood Social Vulnerability Cognitive Schemata was not statistically significant, it was nevertheless negative as predicted.

In addition, the omnibus F-ratio for the set of interactive effects of the orthogonal contrasts for cross-cultural sites with childhood Resource Instability was statistically significant (R = .10, p = .01). Only one of the interaction terms between the contrasts and childhood Resource Instability was found statistically significant: (C2) indicating a higher predicted effect of adult childhood Resource Instability on adult Interpersonal Aggression in North than South America (sR = .08, p = .00). However, this effect was equal in both absolute magnitude and direction to the main effect of childhood Resource Instability so that the direction of that main effect was not reversed, just somewhat augmented in North America and attenuated in South America.

Nevertheless, the omnibus F-ratios for the sets of interactive effects of the orthogonal contrasts for cross-cultural sites with adult DT Traits (R = .08, p = .11), Behavioral Regulation ($R = .05$, $p = .83$), adult Slow LH Strategy ($R = .06$, $p = .49$), and childhood Maternal Sensitivity ($R = .06$, $p = .51$) were not statistically significant for adult Interpersonal Aggression. This indicates that the effects of these three predictor variables were statistically invariant across study sites.

Discussion

All of the hypothesized structural relations within the a priori specified sequence in the cascade model were supported for the seven major constructs in terms of both the statistical significance and expected direction of effects. All of the seven sets of main effects for the planned orthogonal contrasts representing baseline cross-cultural differences among the study sites were statistically significant, except for their effects upon childhood Maternal Sensitivity, which appeared to be statistically invariant across study sites. The main effects of the specific contrasts were generally small in magnitude, and few of them reached statistically significant levels. Of the 21 sets of interactive effects of the planned orthogonal contrasts with each prior criterion variable *qua* predictor, representing cross-cultural differences among the study sites in the effects of each successive predictor, five reached conventional levels of statistical significance. The statistically significant interaction effects of contrasts with predictors were once again relatively few and small in magnitude. In no case was the magnitude and direction of the interactions able to completely reverse that of the corresponding main effect of the predictor, but merely either augmented or attenuated it somewhat across the affected study sites. We can conclude that these results generally support both the configural and metric invariance of the cascade model tested to a relatively high, albeit imperfect, degree.

Although this is a purely correlational analysis, the intent was to evaluate the plausibility of our causal theory. Therefore, we present the narrative of what we construe to be the developmental sequence that we have tentatively reconstructed and estimated in this study, with the necessary caveat that none of our empirical results can support any definitive causal inferences. To streamline this narrative for the purpose of exposition, we will temporarily suspend all qualifiers to that effect, as well as ignore the various small but statistically significant cross-cultural differences identified.

Summary of Results

First, resource instability during childhood reduces perceived maternal sensitivity during childhood. Second, perceived maternal sensitivity during childhood inhibits the development of early social vulnerability cognitive schemata, whereas resource instability during childhood promotes them. Third, early social vulnerability cognitive schemata inhibit the development of adult slow LH strategy, as does resource instability during childhood, whereas maternal sensitivity during childhood promotes it. Fourth, adult slow LH strategy increases behavioral regulation, whereas early social vulnerability cognitive schemata decrease it. Fifth, behavioral regulation inhibits the development of adult "Dark" personality traits, as does adult slow LH strategy, whereas early social vulnerability cognitive schemata promote them. Sixth, and finally, adult Dark personality traits promote interpersonal aggression, as does resource instability during childhood, whereas enhanced behavioral regulation inhibits it.

Figure 2 illustrates these relations graphically. Note that the magnitudes of the links between immediately adjacent constructs in the diagram are generally stronger than those between constructs that are not immediately adjacent to each other. This pattern provides a certain degree of empirical support for our theoretical ordering of the variables in the hypothesized sequence.

Limitations of the Study

The present study was based entirely on retrospective self-reports by research participants via convenience, not representative, sampling. The reconstructed temporal sequence of developmental events is based on the sequence among the *referents* of these self-reports, or the relative timing of the things being retrospectively described. The hypothesized causal sequence is, therefore, based on theoretical considerations rather than being the results of a true longitudinal study, where each event was measured as it actually occurred over the participant's lifetime. Possibly, the memories on which these retrospective reports are based might be at least partially reconstructed based

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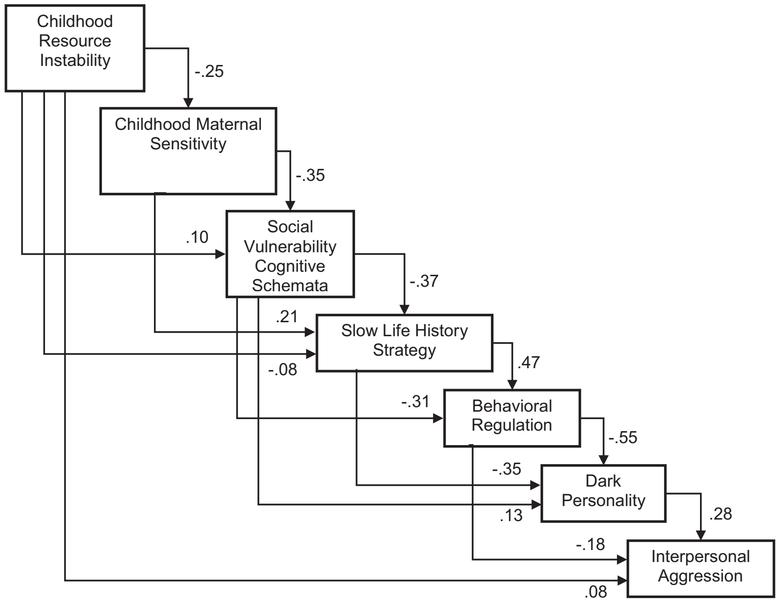

Figure 2. Graphical summary of main results of the cascade model.

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on subsequent experiences. Alternatively, a true longitudinal study of the latter type would take at least two decades to complete, and would be a monumental undertaking to coordinate among five international sampling locations. The present study is our best attempt to do what we could to develop a theoretically plausible model of development for these important psychological constructs given the currently available resources.

Our cascade model contains seven equations, one predicting each criterion variable of interest, and the order among these criterion variables was theoretically specified based on LH theory. Consequently, it should be noted that the generation of plausible alternative hypotheses regarding the causal order that we specified among criterion variables is always possible. Specifically, the number of permutations that it is mathematically possible to generate among our seven criterion variables is seven *factorial* (usually denoted *7!*), which is equal to no less than 5,040 permutations. That means that there are 5,040 mathematically possible orders among our seven equations. Therefore, it is self-evident that testing all such mathematically possible permutations is statistically indefensible, given the massive capitalization on chance that would no doubt occur both in hypothesis testing and parameter estimation.

That being said, there are some plausible rival hypotheses that might be substantively reasonable and perhaps scientifically productive to review. Among these is the relation between childhood resource instability and perceived maternal sensitivity during childhood. This is a special case of the more general observation that developmental research often suffers from the problem of genetic confounding of effects that are commonly attributed to the environment (Plomin, DeFries, Knopik, & Neiderhiser, 2016). The majority of individuals are raised by their own biological parents, to whom they are closely genetically related. Putatively "environmental" constructs, such as our measure of resource instability during childhood, are inevitably influenced by parental behaviors. To the extent that such parental behaviors may be partially heritable, the resulting childhood environments may be influenced by genes that are also present in their offspring (Rowe, 1994). This creates *gene-environment correlations* that necessarily confound any predictions of future offspring behavioral outcomes (Buss, 1987). For instance, early adversity predicting future offspring outcomes may be at least partially attrib-

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utable to statistically spurious effects of common genetic influences throughout development. Maternal genes that might be influencing perceived maternal sensitivity (if accurate) could also be exerting pleiotropic behavioral effects on the generation of household resource instability during childhood (see chapter on *Evolutionary Ecological Systems Theory*; Hertler et al., 2018). If this were indeed occurring, then the direction of the effect from resource instability to maternal sensitivity in our model would need to be reversed. Although the current model is based on the predictions of LH theory, work is currently underway to address this important question using behavioral-genetic methods on genetically informative data (Figueredo, Cabeza de Baca, & Richardson, 2020).

Another such equivocal relation is that between behavioral regulation and the development of adult Dark personality traits. The association among these constructs is well known, and deficits in behavioral regulation (e.g., “impulsiveness” as opposed to “self-control”) are often included in the very definition of some Dark personality traits, such as Psychopathy. The causal ordering among these traits, however, remains uncertain. Some recent models, such as the one presently reported, have hypothesized that the enhanced levels of executive functioning associated with slower LH strategy (e.g., Figueredo, Cuthbertson, Kauffman, Weil, & Gladden, 2012; Salmon, Figueredo, & Woodburn, 2009) suppresses the development of psychopathic and aggressive attitudes (Figueredo et al., 2018); another recent model, however, specifies Dark personality traits as instead causally *before* deficits in executive functions (Figueredo et al., 2018). Both models were cross-culturally replicated, both explain a substantial amount of variance in interpersonal aggression ($R^2 = .76$ and $R^2 = .52$, respectively), and both propose plausible mechanisms for their preferred directionalities. It is not possible at this stage of the ongoing research program to state definitively which constructs precede the others during development, and reversing the direction of prediction has had minimal impact upon the performance of such models.

Finally, it might be worthwhile to mention that all the events reported by respondents in this study presumably transpired in modern environments, within either developed or developing countries, which may or may not closely reflect the more distant ancestral environments of these same societies. Our evolutionary-developmental model is based on the assumption that the developmental mechanisms expressed in such modern environments presumably evolved in more ancestral environments, and that the selective pressures shaping such mechanisms were reasonably comparable then and now (see the concept of *Adaptively Relevant Environments*; Figueredo et al., 2007; Irons, 1998). However, we have no way to ascertain at present whether or to what extent that assumption might be warranted. This is an important problem which must await further research to better elucidate.

Evolutionary Significance of the Study

It is the general consensus within both health and developmental psychology that the development of well-being, self-esteem, secure attachment, and cooperative supportive patterns of social relation in adulthood is largely a consequence of supportive parental care, as through affectionate touch, lack of corporal punishment, responsiveness to the child’s needs, play activities, and social embeddedness (De Wolff & Van Ijzendoorn, 1997; Sanders, 2003). However, we see this as a partial and incomplete account of diversity in human fitness landscapes, as there is no single way of optimizing adaptation. Whereas the above concerted set of developmental conditions certainly permits what we consider *healthy* psychological development, alternative developmental conditions leading to other psychosocial traits can also be adaptive from the perspective of evolutionary success and their intergenerational maintenance, despite not being “healthy” from the point of view of modern cultural standards (Hertler et al., 2018). Individuals and communities may create and reinforce social niches where seemingly chaotic syndromes of behavior are adaptively *functional* in the context of fast LH strategies. We argue that the self-reinforcing nature of LH strategies and their psychosocial *sequelae* happens partially through active *niche construction*.

Niche construction is the process by which organisms modify their own and each other’s niches through their own activities, generating new conditions for development, and a new

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context for adaptation. Although the focus of niche construction theory has been primarily at the ecological modifications and ecological consequences to organisms (Flack, Girvan, De Waal, & Krakauer, 2006), the logic of active niche construction can also be applied to psychosocial modifications and implications drawn for psychosocial consequences. Populations and their subgroups, such as families and individuals, can also be analyzed through the lens of niche construction theory, as they modify and are impacted by modifications to their microniches. This means that the developmental niches constructed for offspring throughout evolutionary history are not all the same: Different forms of social relationship may have been fostered for different communities or families within them, depending on their ecological conditions and personal characteristics.

It is readily recognized that the contended "optimal" developmental niche is *constructed,* as it does not come exclusively from the external environment but from social organization (Narvaez, Wang, & Cheng, 2016; Sterelny, 2007). Likewise, alternative developmental niches are constructed and not simply a product of the external environment to which groups and individuals are subjected. However, the term "construction" should not necessarily connote the meaning of premeditated intentionality: Niche construction is often a selected *response* to conditions in the environment and limited to the current behavioral repertory of the individuals constructing the niche. Accordingly, comparatively faster LH communities would construct niches that not only suit but actually *reinforce* their biopsychosocial adaptations, optimizing their fitness by building cultural practices that capitalize on the high variability of conditions. Instability and adversity themselves are reliable constants in their ecology, and such communities would benefit, from the point of view of evolutionary success, from the ability to navigate such environments rather than avoid them and prioritize traits considered "optimal" from the point of view of health psychology.

Thus, the family environment may serve to prepare the child for the average social environment that recurrently occurs in the family's preceding history. An adaptive family environment does not prepare children for an idealized future environment, but rather to conditions close to their present reality. Many niches are stable, especially for those with a largely stable culture, where reliable sociocultural conditions exist. The notion that constructed niches *protect* against harshness and encourage safety and social cohesion is common (Flynn, Laland, Kendal, & Kendal, 2013). The maintenance of such long-term social features is prioritized by individuals and groups that live in relatively stable, predictable niches in which cumulative and future payoffs to current investments are reliable. For example, interpersonal aggression is frequently interpreted as a manifestation of failed impulse control or an underlying psychopathological condition and, thus, seen as maladaptive (for a review, see Fernandes, Figueredo, & Peñaherrera-Aguirre, 2018). Aggression indeed jeopardizes the successful implementation of long-term mating strategies, investments in kin, and the maintenance of long-term cooperative efforts; thus, reducing or impeding group cohesion (Figueredo & Jacobs, 2010).

Other niches, however, involve largely unstable conditions (Rowley-Conwy & Layton, 2011). Parenting styles that foster stability may seem ideal from the point of view of production of subjective well-being, but out of sync with the reality of the adult ecology that awaits individuals. In unstable, faster LH communities, interventions on aggression without simultaneous interventions on providing stable and predictable opportunities are likely to produce mismatch, dissonance, and the deprivation of adaptive strategies to solve problems faced in one's niche (Ellis et al., 2012). Modifying rough parenting styles that train children to face and succeed in adversity may not need to be discarded as a goal, but to ensure long-term adjustment one should arguably also correspondingly modify the social niche that these children will encounter as adults (Brumbach, Figueredo, & Ellis, 2009; Ellis et al., 2009, 2012). For example, reactivity and irritability early in life can be a valuable basis for assertiveness and status-seeking in adulthood and parenting styles may train children for that, whereas in other social niches such early traits may be detrimental to successfully navigating adult relations (Worthman & Brown, 2005).

The fact that multiple forms of child abuse, neglect, lack of sensitivity, and adversity in parenting styles in general are intergenerationally cyclical is well known (Belsky, 1993; Kaufman & Zigler, 1989), and the present cas-

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cade analysis reinforces that notion. Indeed, a recent longitudinal cross-national study has used critical dimensions such as household chaos, neighborhood danger, harsh maternal parenting, and maternal affection to predict child outcomes such as externalizing behaviors, internalizing behaviors, and school achievement (Deater-Deckard et al., 2019). The cross-cultural invariance of these results across low- and middle-income countries (LMICs) were confirmed by multigroup structural equation models (MSEMs). However, to our knowledge this is the first study to explicitly tie this phenomenon empirically to the nexus of LH speed, permitting a theoretical analysis of the adaptive aspects behind it. Facilitating intergenerational recurrence is the self-reinforcing nature of LH strategies (Pianka, 1970), occurring where the majority of others in the social niche are also pursuing fast LH and short-term social strategies (rather than favoring or even permitting long-term bond formation). This collective self-reinforcement of LH strategies permits the establishment of community effort in niche construction. What is forwarded here is the hypothesis that chaotic patterns of relationship in childhood prepare for the equally chaotic unpredictable and harsh niches of fast LH adulthood. The psychobehavioral set of characteristics described in the above cascade are not necessarily maladaptive from the point of view of successful replication across generations and, therefore, appear evolutionary functional. They only appear *maladjusted* to the expectations of someone who is not embedded in fast LH niches.

Furthermore, rather than being premeditated, intentional, or even ego-syntonic, the intergenerational repetition of these parenting practices may be perceived as undesirable even by those who practice them. This realization serves to avoid blaming individuals but also to understand that parenting practices may be perceived at least partly as unavoidable and uncontrollable, which reinforces the theoretical notion that it is a product of the niche. Second, no relationship between childhood experiences and adult patterns of behavior identified in the present study or in previous studies is deterministic. In the face of measurement error and stochastic processes, individuals do sometimes break out of the pattern of intergenerational repetition. As such, it is in no way implied by the present discussion that it is the inevitable fate of individuals to reproduce the parenting and familial patterns of relationship to which they were exposed during earlier stages of development.

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