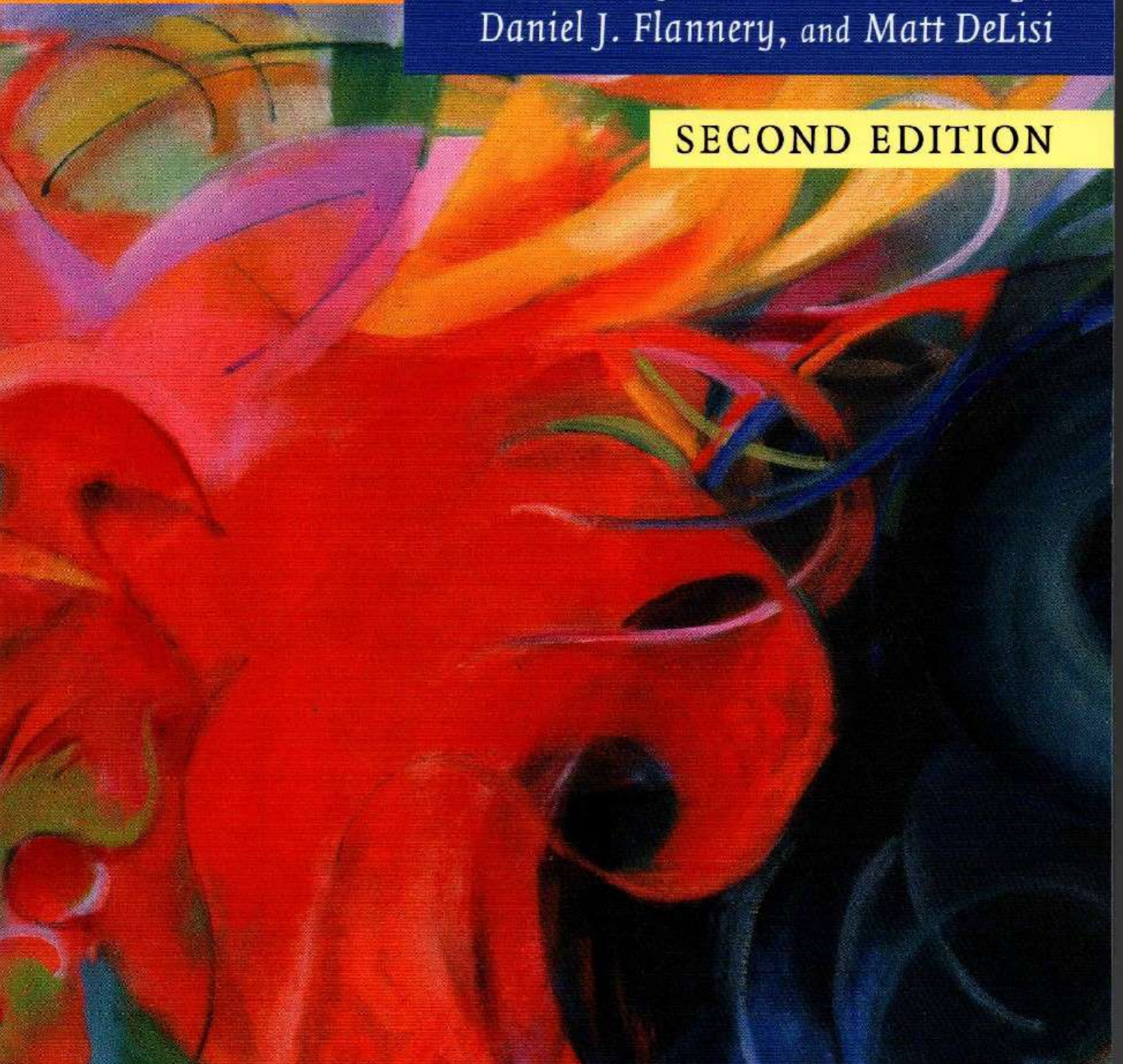


THE CAMBRIDGE HANDBOOK OF
VIOLENT
BEHAVIOR AND
AGGRESSION

*Edited by Alexander T. Vazsonyi,
Daniel J. Flannery, and Matt DeLisi*

SECOND EDITION



The Cambridge Handbook of Violent Behavior and Aggression

Second Edition

Edited by

Alexander T. Vazsonyi

University of Kentucky

Daniel J. Flannery

Case Western Reserve University

Matt DeLisi

Iowa State University



CAMBRIDGE
UNIVERSITY PRESS

CAMBRIDGE
UNIVERSITY PRESS

University Printing House, Cambridge CB2 8BS, United Kingdom

One Liberty Plaza, 20th Floor, New York, NY 10006, USA

477 Williamstown Road, Port Melbourne, VIC 3207, Australia

314-321, 3rd Floor, Plot 3, Splendor Forum, Jasola District Centre,
New Delhi – 110025, India

79 Anson Road, #06-04/06, Singapore 079906

Cambridge University Press is part of the University of Cambridge.

It furthers the University's mission by disseminating knowledge in the pursuit of education, learning, and research at the highest international levels of excellence.

www.cambridge.org

Information on this title: www.cambridge.org/9781316632215

DOI: 10.1017/9781316847992

First and Second editions © Cambridge University Press 2007, 2018

This publication is in copyright. Subject to statutory exception and to the provisions of relevant collective licensing agreements, no reproduction of any part may take place without the written permission of Cambridge University Press.

First published 2007

Second edition 2018

Printed and bound in Great Britain by Clays Ltd, Elcograf S.p.A.

A catalogue record for this publication is available from the British Library.

Library of Congress Cataloging-in-Publication Data

Names: Vazsonyi, Alexander T., 1964– editor. | Flannery, Daniel J., 1962– editor. | DeLisi, Matt, editor.

Title: The Cambridge handbook of violent behavior and aggression / edited by Alexander T. Vazsonyi, University of Kentucky, Daniel J. Flannery, Case Western Reserve University, Ohio, Matt DeLisi, Iowa State University.

Description: Second edition. | Cambridge, United Kingdom; New York, NY: Cambridge University Press, 2018. | Includes bibliographical references and index.

Identifiers: LCCN 2017053514 | ISBN 9781107180437 (hardback) | ISBN 9781316632215 (paperback)

Subjects: LCSH: Violence. | Aggressiveness. | Deviant behavior. | Antisocial personality disorders.

Classification: LCC HM1116 .C36 2018 | DDC 303.6–dc23

LC record available at <https://lcn.loc.gov/2017053514>

ISBN 978-1-107-18043-7 Hardback

ISBN 978-1-316-63221-5 Paperback

Cambridge University Press has no responsibility for the persistence or accuracy of URLs for external or third-party internet websites referred to in this publication and does not guarantee that any content on such websites is, or will remain, accurate or appropriate.

Contents

<i>List of Contributors</i>	page xi
<i>Introduction: The Cambridge Handbook of Violent Behavior and Aggression</i>	xv
ALEXANDER T. VAZSONYI, DANIEL J. FLANNERY, AND MATT DELISI	

Part I Introduction and Overview

- | | | |
|---|--|----|
| 1 | Origins of Violent Behavior over the Life Span | 3 |
| | DAVID P. FARRINGTON | |
| 2 | Longitudinal Study of Personality and Social Development: Insights about Aggression after Five Decades | 31 |
| | LEA PULKKINEN | |
| 3 | A Life-Course Model for the Development of Intimate Partner Violence | 52 |
| | J. MARK EDDY, JEAN SCHUMER, JOANN WU SHORTT,
DEBORAH M. CAPALDI, STACEY S. TIBERIO, AND SABINA LOW | |
| 4 | The Dark Violence Hybrid: The Cross-Cultural Validation of an Integrative Model | 65 |
| | AURELIO JOSÉ FIGUEREDO, EMILY ANNE PATCH,
MARISOL PEREZ-RAMOS, AND GABRIELA JACQUELINE CRUZ | |

Part II Biosocial Foundations of Violence and Aggression

- | | | |
|---|--|-----|
| 5 | The Behavioral Genetics of Aggression and Violent Behavior | 83 |
| | J. C. BARNES AND JORIM TIELBEEK | |
| 6 | Neuroimaging Evidence of Violence and Aggression | 106 |
| | HEATHER MCLERNON, JEREMY FEIGER, AND ROBERT SCHUG | |
| 7 | Biosocial Bases of Aggression and Antisocial Behavior | 125 |
| | JILL PORTNOY | |
| 8 | The Neuropsychology of Violence | 136 |
| | JEAN R. SÉGUIN, LINDA BOOIJ, AND SCOTT O. LILIENTELD | |

4 The Dark Violence Hybrid: The Cross-Cultural Validation of an Integrative Model

Aurelio José Figueredo, Emily Anne Patch,
Marisol Perez-Ramos, and Gabriela Jacqueline Cruz

Introduction

Viewing behavior through an evolutionary lens allows researchers to identify both adaptive and maladaptive proximate responses to certain contexts in relation to their ultimate consequences. The purpose of this paper is to follow a theoretically predicted cascade of consequences starting from the life history strategies of individuals, through the development of various cognitive social schemata, to their effects on behavioral self-regulation and rule governance, to their ultimate *sequelae* in enacting various forms of interpersonal aggression. In so doing, we also hoped to provide some support for the criterion validation of a recently introduced, mostly attitudinal measure called the Dark Inventory (DI) (Patch, 2014) with respect to self-reported interpersonal aggression.

Life History (LH) theory is a seminal theory derived from evolutionary biology that describes how and why individual organisms allocate varying amounts of bioenergetic resources towards different components of fitness, whereas the different resource allocation profiles that may evolve and develop as a result of varying selective pressures are called LH strategies. Allocations towards different components of fitness include those

dedicated to growth and maintenance of the body as well as those dedicated to producing offspring (Figueredo, Patch, & Gómez-Ceballos, 2015); these two disparate resource expenditures are denoted *somatic effort* and *reproductive effort*, respectively. Within the domain of reproductive effort, there are two subordinate domains of resource allocation: *mating effort* and *parental effort* (Ellis et al., 2009; Figueredo & Jacobs, 2010). Mating effort consists of expending time and energy acquiring and retaining sexual partners while parental effort refers to expending energy contributing to the development and survival of an organism's offspring and other genetic kin.

LH theory predicts that organisms will allocate more resources towards somatic than reproductive effort if their environments are stable and predictable, resulting in a *slow* LH strategy; for instance, the organism has the time to devote developmental resources to growing long bones or developing a larger brain. Conversely, an individual would instead devote more resources to early sexual maturation and reproduction if the environment is harsh or unpredictable. In a harsh or unpredictable environment, uncontrollable or *extrinsic* mortality is high. It therefore becomes adaptive to develop and reproduce

quickly, enhancing the probability that an organism's genes will be passed on prior to being overtaken by any unavoidable cause of premature death.

LH theory makes predictions related to observable, biodemographic outcomes such as parental effort, inception of puberty, age of first sexual activity, or age of first birth (MacArthur & Wilson, 1967; Pianka, 1970). Fast LH strategists evolve traits that facilitate reproduction: (1) earlier pubertal timing; (2) higher number of mating partners; (3) earlier first parturition; (4) higher number of offspring; or (5) lower levels of parental care, as compared with their slower counterparts. Slower LH strategists first expend resources in promoting their own growth and preservation and only then in producing offspring, thus evolving: (1) later first parturition; (2) fewer offspring; (3) high parental investment; and (4) extended lifespan.

In addition to these biodemographic outcomes, LH theory makes predictions about psychological traits (Figueredo et al., 2014). Fast-LH individuals display a constellation of psychosocial characteristics selected to increase their proximate expenditure of mating effort, with the ultimate function of achieving a higher fertility. They maintain positive attitudes toward promiscuity and risk-taking behavior, are more impulsive, maintain suspicious attitudes towards others, and are less governed by social norms (Figueredo et al., 2015; Olderbak & Figueredo, 2010).

Figueredo and Jacobs (2010), as well as Patch, Figueredo, Garcia, and Kavanagh (in prep.), have proposed that faster-LH strategists are likely to evolve and develop antagonistic social schemata, thus increasing the likelihood of developing Dark Triad (DT) traits, such as *psychopathy*,

narcissism, and *machiavellianism*. New research supports the prediction that harsh or unpredictable early childhood environments may result in elevated DT characteristics (Jonason, Icho, & Ireland, 2016). LH theory (and evolutionary theory more broadly) might be particularly important when examining behavior that may appear deviant or maladaptive, such as the DT traits, especially when they continue to persist in the general population despite our efforts to suppress them. The three DT personalities have many seemingly maladaptive characteristics. High-DT individuals are callous (Jonason et al., 2009; Jones & Figueredo, 2013; Paulhus & Williams, 2002), have a grandiose sense of self (Patch et al., in prep.), are highly suspicious and coercive (Jones & Paulhus, 2010), and rarely conform to societal rules (Figueredo et al., 2015), very much akin to the constellation of traits associated with faster-LH individuals.

In addition to LH speed and DT personalities, executive functioning is believed to be another important determinant of aggressive behavior. Individuals with a high degree of executive functioning abilities demonstrate superior cognitive flexibility in domains ranging from future planning to inhibiting or delaying responding. They plan and prioritize actions in a streamlined manner (Lezak, Howieson, & Loring, 2004). Importantly, individuals with good executive functioning are able to suppress their impulses.

Executive functions have been shown to function at low levels in DT personalities (Patch et al., in prep.). A fast-LH individual with low executive function and high DT traits would have little concern for following the rules of society and exhibit a high degree of interpersonal aggression (Figueredo et al., 2015). It is probably for

this reason that, while psychopaths make up less than 3% of the male population, they make up 20% of the prison population (Tuvblad et al., 2014).

Based on prior research, the present study tests a structural model for the prediction of interpersonal aggression, using two very disparate samples. One sample represents an undergraduate college student population from the State of Arizona and the other represents a population of married homemakers, each with at least one adolescent child, residing in the Mexican Municipality of Ixtapaluca. We compared the second sample to the first for the purpose of trying to offset for any biases that might arise when relying exclusively upon student samples.

Ixtapaluca is a municipality that comprises part of the State of Mexico, located 23 kilometers east of Mexico City. The Secretariado Ejecutivo del Sistema Nacional de Seguridad Pablica (2012) places Ixtapaluca as having the tenth-highest crime rate among the 125 municipalities that constitute the State of México (SESNP, 2012). The most common crime is common robbery, followed by injuries, burglaries, sexual assaults, homicides, and kidnappings. As might be imagined, the problem of criminality exists not only at the level of the Municipality but also at the level of the State. As recently as only two years ago, the Mexican Federal Government issued a *gender alarm* in response to the very high rates of femicides in the State of Mexico, and the Municipality of Ixtapaluca was once again found to have one of the top ten rates of femicide within the State of Mexico.

Within this context of criminality, one of the most common manifestations of violence within the Ixtapaluca community is domestic (or "intimate partner") violence,

meaning those acts of aggression that are restricted to interactions within private contexts. Violence may be present among couples that are currently dating or in a sexual relationship, whether or not they are living together under the same roof, or between former sexual partners. Another modality of family violence extends itself to children and to elders. This makes it especially important to validate better measures of the DT personality factors as possible risk factors for violent behavior in one sample derived from a context of violence in comparison with another sample seemingly without presenting these same levels of aggression. Such comparisons would empirically support the validity of the hypothesized measurement and structural models predicting interpersonal aggression.

Another aim of this study was to examine the mediating role of the DT personalities, and specifically the construct of an *antagonistic social schema*, hypothesized to account for much of the observed association between LH strategy and interpersonal aggression (Figueredo, Gladden, & Beck, 2012; Figueredo, Gladden, & Hohman, 2012). Previous research had examined Culture of Honor "Revenge" Ideology (see Figueredo et al., 2004) in the mediating role; however, as might be evident from much of the foregoing, DT personalities may be more causally influential.

Method

Participants

Sample 1 consisted of 121 participants that were recruited from a southwestern US university undergraduate psychology subject pool. The sample was 72% female with a mean age of 19.33 years ($SD = 1.72$, range

18–31). Ethnicity distribution was 55% White, 18% Hispanic, 9% Asian, 5% other, and 7% mixed race. Three participants identified as Native American, one as African-American, and one declined to identify their ethnicity.

Sample 2 consisted of 100 Mexicans from the city of Ixtapaluca in Mexico. The sample was 91% female, with a median age of 38.53 years. While the entire sample reported they were Mexican nationals, 51% identified as indigenous Mexicans, while 31% reported they were Mestizo.

Procedure

Sample 1 participants completed a set of self-report measures online to ensure anonymity and confidentiality. All participants gave informed consent and were debriefed in person. The data were collected using Qualtrics data collection software.

Sample 2 parents were contacted through a high school located in the “El Molino” neighborhood of Ixtapaluca. They were initially contacted by telephone to invite them to participate in the study and to set a time and date for meeting. Data were collected by face-to-face interviews, during school hours. Data collection took approximately 24 months to complete.

Measures

Higher-Order LH (Super-K)

LH strategy. The Mini-K Short Form (Figueredo et al., 2006) measures slow LH strategy. The Mini-K consists of 20 items and is a short form of the Arizona Life History Battery (Figueredo, 2007). The Mini-K measures a variety of LH indicators such as familial closeness and risk avoidance rated on a 7-point Likert scale ($-3 = \textit{strongly disagree}$; $+3 = \textit{strongly}$

agree). Slower LH strategies were also measured using the High-K Strategy Scale (HKSS; Giosan, 2006). The scale consists of 26 items rated on a 5-point Likert scale ($-2 = \textit{strongly disagree}$; $+2 = \textit{strongly agree}$). It contains items that are indicators of health, “upward mobility,” and extended family; all are attempting to measure the larger latent life history factor.

Covitality. Current levels of mental and physical functioning were measured using the Rand 36 Item Health Survey: Version 1 (Ware & Sherbourne, 1992). The Rand 36 Short Form correlates with the Mini-K as a measure of slow LH strategy. The measure consists of 36 items assessing emotional and physical well-being.

Personality. The General Factor of Personality was measured using an aggregate of the *Ten-Item Personality Inventory* (TIPI; Gosling et al., 2003). The TIPI consists of ten items, measured using a 7-point Likert scale ($-3 = \textit{disagree strongly}$; $+3 = \textit{agree strongly}$). The TIPI measures the Big 5 personality dimensions.

Dark Triad Personalities

The Dark Inventory (DI; Patch et al., in prep.). The DI is a measure of DT characteristics that does not classify the three personalities into separate traits, but rather groups them according to dissimilar cognitive social schemata: antagonistic and mutualistic. In addition, a third cluster of the scale, lability, measures impulsive attitudes, boredom, and ability to remain calm under stressful circumstances. The Antagonistic Social Schema (ASS) cluster consists of: (1) deception; (2) grandiosity; (3) external blame; (4) suspicion of others and their motives; and (5) social

nonconformity. The Mutualistic Social Schema (MSS) consists of: (1) emotional empathy; (2) emotional attachment; and (3) affiliative dominance. Liability consists of: (1) impulsivity; and (2) stress reactivity. Participants rate how much they agree or disagree with each item on a 7-point Likert scale ($-3 = \textit{strongly disagree}$; $+3 = \textit{strongly agree}$). Each of these scales is estimated as the mean of each cluster with certain items reversed. When constructing the general DI factor, the entire MSS cluster is reversed.

Behavioral self-regulation (BRIEF; Gioia et al., 2002). The Behavioral Regulation Scales of the Brief Ratings Inventory of Executive Function (BRIEF) measured behavioral and cognitive inhibition, as well as self-regulation, all as indicators of executive functioning. The Behavioral Regulation Scales of the BRIEF contains 30 items within four subscales, each rated on a 7-point scale ($0 = \textit{never}$; $6 = \textit{almost always}$).

Rule Governance (RG)

The Rule Governance Scale (Garcia, Gladden, Figueredo, & Jacobs, in preparation) consists of two subscales: Rule Governance Good (RGG) and Rule Governance Lawful (RGL). RGG measures altruistic behaviors (i.e., generosity toward strangers). RGL measures one's concern for following societal laws (i.e., respecting the authority of a police officer). A sample RGG item was "Would you donate time and money to improve the local community?" Typically, two of the response options would result in a positive score ($+1$) on the respective component, such as: "Yes, the needs of the community are a top priority to me" and "Yes, I would donate as much as I can once my own needs are met." A sample RGL

item was "I would obey the authorities in the community," with the two positive response options: "Almost Always" and "Sometimes."

Same-Sex and Opposite-Sex Interpersonal Aggression

The 94-item Interpersonal Relations Rating Scale (IRRS; Figueredo et al., 2010) was used to measure psychological and physical aggression towards any and all members of their same sex and with any and all members of the opposite sex (whether or not they were romantic partners) with which participants had interacted. Participants rated how often each action had occurred in the past 12 months on a 6-point scale ($0 = \textit{never}$; $5 = \textit{daily}$). The scale contains 47 parallel items for same-sex victims of interpersonal aggression, aggregated into a scale called the IRRS-S, and 47 parallel items for opposite-sex victims of interpersonal aggression, aggregated into a scale called the IRRS-O. These items were constructed to be otherwise equivalent in form and content to the items of the Relationship Behavior Rating Scale – Revised (RBRS-R), except that they asked participants to report their perpetration rather than their victimization, and that the questions were not limited to interactions with romantic partners. The IRRS-S scale includes items such as "I put down a member of my same sex" and "I threw objects at a member of my same sex." The IRRS-O scale includes items such as "I put down a member of the opposite sex" and "I threw objects at a member of the opposite sex." A total of five subscales were constructed for each IRRS perpetration scale, equivalent to those of the RBRS-R victimization scale.

Statistical Analyses

The measurement models. A hierarchical analytical strategy was employed to construct the measurement models, using SAS 9.1.3 (SAS Institute, 2004). Using PROC STANDARD and DATA, unit-weighted composite scores were estimated by computing: (1) the means of the standardized scores for all nonmissing items on each subscale; (2) the means of the standardized scores for all nonmissing subscales on each scale; and (3) the means of the standardized scores for all nonmissing scales on each factor (Figueredo, McKnight, McKnight, & Sidani, 2000). The Cronbach's alphas and the part-whole correlations of the scales with the unit-weighted factor scales were computed using PROC CORR. The hierarchical regressions within the sequential cascade model were estimated using the UniMult 2 software (UM2; Gorsuch, 2016) package.

The structural models. The structural models for combining the results of Study 1 and Study 2 were structured as a system of hierarchical multiple regressions referred to as a *cascade model* in cognitive psychology (Demetriou, Christou, Spanoudis, & Platsidou, 2002; Mouyi, 2006). This procedure is conceptually equivalent to a sequential canonical analysis (Figueredo & Gorsuch, 2007), which controls statistically for any indirect effects of the predictors through the causally prior criterion variables.

In a cascade model, a series of hierarchical multiple regressions is performed in which the multiple criterion variables are analyzed sequentially according to a hypothesized causal order. Because these criterion variables are expected to causally influence each other, they are entered sequentially into a system of multiple regression equations with each hierarchically

prior criterion variable entered as the first predictor for the next. Thus, each successive criterion variable is predicted from an initial predictor variable, each time entering the immediately preceding criterion variable hierarchically as the first predictor, then entering all the ordered predictors from the previous regression equation. Thus, each successive regression enters all of the preceding criterion variables in reverse causal order, to statistically control for any indirect effects that might be transmitted through them. Within this analytical scheme, the estimated effect of each predictor is limited to its direct effect on each of the successive criterion variables. As the present study entails a constructive replication, a binary (1,0) "dummy variable" was also created for performing formal cross-sample comparisons of parameter estimates (Cohen & Cohen, 1983). The interaction of each successive variable in the cascade was used in the prediction of the next, as well as all that follow.

Cascade models were preferable because they allowed for the collinearities among our dependent criterion variables to be examined and sequentially statistically controlled. In the model presented here, Super-K, a latent common factor measuring LH strategy, is used to predict MSS in the first equation. In the second equation, the contribution of MSS to the prediction ASS is statistically controlled prior to estimating that of the Super-K Factor, which was the only predictor in the first equation. In each equation, any significant predictor of the dependent criterion variable thus represents the direct contribution of that predictor after having already statistically controlled for any indirect effects that might have been transmitted through the prior ones.

The ordering of variables is of paramount importance in a cascade model

and each must be entered sequentially as specified by theory. In our model, MSS is hypothesized to be directly influenced by Super-K, as a slower LH speed is theorized to give rise to an individual who is more empathic and cooperative. ASS is the second criterion variable in the model, as those low on mutualism will likely lack empathy, be highly suspicious of others, use deception frequently, and blame others for their transgressions and devious actions. These traits are highly indicative of DT personalities, which are associated with low anxiety and high impulsivity, so we hypothesize that Affective and Cognitive Liability can be predicted from antagonism. Faster-LH individuals are high on DT traits but have disparate executive functioning abilities. While they are high on some aspects of executive functioning, like the ability to shift from one task to another with ease, they are low on behavioral and emotional regulation (Mittal, Griskevicius, Simpson, Sung, & Young, 2015). Executive function is therefore the next criterion variable in the model, following Affective and Cognitive Liability. A deficit in executive functioning then predicts a lack of rule governance; an individual may be unable to control their impulses or regulate their behavior well enough to properly adhere to societal and cultural norms. Ultimately, we hypothesize that this inability and failure to follow rules leads to a high degree of interpersonal aggression.

Results

Measurement Models

The first major psychometric question to address is whether the basic measurement models for the DI were replicated across the Arizona and Ixtapaluca samples, as

the validity of the results of the structural model is critically dependent upon that fundamental premise. The following set of tables display those results in parallel for the two cross-cultural samples.

Table 4.1 displays the unit-weighted factor structures of the Mutualistic Social Schema (MSS) Factor with respect to its three indicators. We observe that the factor loadings were literally identical.

Table 4.2 displays the unit-weighted factor structures of the Antagonistic Social Schema (ASS) Factor with respect to its five indicators. We observe that the factor loadings were nearly identical, with the exception of two corresponding pairs of factor loadings differing by 0.01.

Table 4.3 displays the unit-weighted factor structures of the Affective and Cognitive Liability (ACL) Factor with respect to its two indicators. We observe that the factor loadings were, once again, literally identical.

We conclude that the results of these comparisons indicate an acceptable degree of measurement invariance.

Structural Models

The second major theoretical question to address is whether the basic structural model for predicting interpersonal aggression from the DI, through our theoretically specified order of hypothesized mediators, was replicated across the Arizona and Ixtapaluca samples. Table 4.4 displays those results in parallel for the two cross-cultural samples.

Mutualistic Social Schema. We see from this first regression equation that slow life history strategy, as operationalized by the Super-K Factor, significantly and positively predicted the Mutualistic Social Schema Factor, as expected by theory.

Table 4.1 *Mutualistic Social Schema*

Mutualistic Social Schema	Arizona Factor Loading	Arizona $p(H_0)$	Ixtapaluca Factor Loading	Ixtapaluca $p(H_0)$
Affiliative dominance	0.70*	< 0.0001	0.70*	< 0.0001
Emotional attachment	0.75*	< 0.0001	0.75*	< 0.0001
Emotional empathy	0.63*	< 0.0001	0.63*	< 0.0001

Note: * $p < 0.05$.

Table 4.2 *Antagonistic Social Schema*

Antagonistic Social Schema	Arizona Factor Loading	Arizona $p(H_0)$	Ixtapaluca Factor Loading	Ixtapaluca $p(H_0)$
Distrust	0.83*	< 0.0001	0.82*	< 0.0001
Deception	0.78*	< 0.0001	0.78*	< 0.0001
External blame	0.78*	< 0.0001	0.77*	< 0.0001
Grandiosity	0.80*	< 0.0001	0.79*	< 0.0001
Social nonconformity	0.58*	< 0.0001	0.58*	< 0.0001

Note: * $p < 0.05$.

Table 4.3 *Affective and Cognitive Liability*

Affective and Cognitive Liability	Arizona Factor Loading	Arizona $p(H_0)$	Ixtapaluca Factor Loading	Ixtapaluca $p(H_0)$
Impulsivity	0.77*	< 0.0001	0.77*	< 0.0001
Stress reactivity	0.77*	< 0.0001	0.77*	< 0.0001

Note: * $p < 0.05$.

Further, we see that there was no significant parametric difference in the size of this effect between the Arizona and Ixtapaluca samples, as operationalized by the interaction of our binary dummy variable for Sample with the Super-K Factor.

Antagonistic Social Schema. We see from this second regression equation that the Mutualistic Social Schema Factor significantly and negatively predicted the

Antagonistic Social Schema Factor, as expected by theory. Further, we see that there was no significant parametric difference in the size of this effect between the Arizona and Ixtapaluca samples.

In addition, we see that the Super-K Factor had no significant main effect upon the Antagonistic Social Schema Factor, but that the interaction of the Super-K Factor with our binary dummy variable for Sample did significantly and negatively

Table 4.4 *Sequential Canonical "Cascade" Model*

Criterion Variables	Prior Criterion Variables	Predictor Variables	DF	Semipartial Correlations	p(H ₀)
Mutualistic Social Schema		Super-K	1,209	0.18*	0.009
		Super-K *sample	1,209	0.09	0.20
<i>Mutualistic R²</i>			2,209	0.20*	0.01
Antagonistic	Mutualistic		1,207	-0.39*	< 0.0001
	Mutualistic *sample		1,207	0.07	0.29
		Super-K	1,207	-0.08	0.19
		Super-K *sample	1,207	-0.17*	0.007
<i>Antagonistic R²</i>			4,207	0.44*	< 0.0001
Affective and Cognitive Lability	Antagonistic		1,205	0.49*	< 0.0001
	Antagonistic *sample		1,205	0.04	0.44
	Mutualistic		1,205	-0.29*	< 0.0001
	Mutualistic *sample		1,205	0.15*	0.01
		Super-K	1,205	-0.05	0.38
		Super-K *sample	1,205	-0.05	0.38
<i>Lability R²</i>			6,205	0.60*	< 0.0001
Executive Functions	Lability		1,203	-0.39*	< 0.0001
	Lability *sample		1,203	0.20*	0.0005
	Antagonistic		1,203	-0.30*	< 0.0001
	Antagonistic *sample		1,203	0.02	0.76
	Mutualistic		1,203	0.04	0.45
	Mutualistic *sample		1,203	-0.01	0.90
		Super-K	1,203	0.10	0.10
		Super-K *sample	1,203	0.20*	0.0004
<i>Executive R²</i>			8,203	0.58*	< 0.0001

(continued)

Table 4.4 (cont.)

Criterion Variables	Prior Criterion Variables	Predictor Variables	DF	Semipartial Correlations	p(H ₀)
Rule Governance	Executive		1,201	0.24*	0.0004
	Executive		1,201	-0.09	0.16
	*sample				
	Lability		1,201	-0.04	0.57
	Lability		1,201	-0.07	0.30
	*sample				
	Antagonistic		1,201	-0.13*	0.05
	Antagonistic		1,201	0.13*	0.05
	*sample				
	Mutualistic		1,201	-0.01	0.83
	Mutualistic		1,201	0.05	0.45
*sample					
		Super-K	1,201	0.05	0.44
		Super-K	1,201	0.08	0.24
		*sample			
<i>Governance R²</i>			10,201	0.34*	0.004
Interpersonal Aggression	Governance		1,199	-0.21*	0.0009
	Governance		1,199	0.14*	0.03
	*sample				
	Executive		1,199	-0.40*	< 0.0001
	Executive		1,199	-0.13*	0.03
	*sample				
	Lability		1,199	0.04	0.47
	Lability		1,199	-0.04	0.49
	*sample				
	Antagonistic		1,199	0.11	0.08
	Antagonistic		1,199	-0.05	0.44
	*sample				
	Mutualistic		1,199	-0.06	0.29
Mutualistic		1,199	0.08	0.20	
*sample					
		Super-K	1,199	-0.01	0.83
		Super-K	1,199	-0.04	0.46
		*sample			
<i>Aggression R²</i>			12,199	0.52*	< 0.0001

Note: *p < 0.05.

predict the Antagonistic Social Schema Factor. This indicated that there was a significant parametric difference in the size of this effect between the Arizona and Ixtapaluca samples, where the effect only reached acceptable levels of statistical significance in the latter and not the former.

Affective and Cognitive Liability. We see from this third regression equation that Antagonistic Social Schema Factor significantly and positively predicted the Affective and Cognitive Liability Factor, as expected by theory. Further, we see that there was no significant parametric difference in the size of this effect between the Arizona and Ixtapaluca samples.

We also see that Mutualistic Social Schema Factor significantly and negatively predicted the Affective and Cognitive Liability Factor, again as expected by theory. Further, the interaction of the Mutualistic Social Schema Factor with our binary dummy variable for Sample did significantly and positively predict the Affective and Cognitive Liability Factor. This indicated that there was a significant parametric difference in the size of this effect between the Arizona and Ixtapaluca samples, where this effect in the Ixtapaluca sample was reduced to about half of its negative magnitude in the Arizona sample, without reversing its direction. Finally, we see that the Super-K Factor had no significant main effect or interaction with Sample upon the Affective and Cognitive Liability Factor, once statistically controlled for those of the Antagonistic and Mutualistic Social Schemata.

Executive Functions. We see from this fourth regression equation that the Affective and Cognitive Liability Factor significantly and negatively predicted the Executive

Functions Factor, as expected by theory. Further, we see that there was no significant parametric difference in the size of this effect between the Arizona and Ixtapaluca samples. Further, the interaction of Affective and Cognitive Liability with our binary dummy variable for Sample also significantly and positively predicted the Executive Functions Factor. This indicated that there was a significant parametric difference in the size of this effect between the Arizona and Ixtapaluca samples, where this effect in the Ixtapaluca sample was once again reduced to about half of its negative magnitude in the Arizona sample, without reversing its direction.

We also see that the Antagonistic Social Schema Factor significantly and negatively predicted the Executive Functions Factor, again as expected by theory. Further, we see that there was no significant parametric difference in the size of this effect between the Arizona and Ixtapaluca samples.

Finally, we see that neither the Mutualistic Social Schema Factor nor the Super-K Factor had any significant main effects or interactions with Sample upon the Executive Functions Factor, once statistically controlled for those of Affective and Cognitive Liability as well as Antagonistic and Mutualistic Social Schemata.

Rule Governance. We see from this fifth regression equation that the Executive Functions Factor significantly and positively predicted the Rule Governance Factor, as expected by theory. Further, we see that there was no significant parametric difference in the size of this effect between the Arizona and Ixtapaluca samples.

We also see that the Antagonistic Social Schema Factor significantly and negatively predicted the Rule Governance Factor,

again as expected by theory. Further, we see that there was a significant parametric difference in the size of this effect between the Arizona and Ixtapaluca samples, with the interaction effect completely cancelling out the main effect such that the effect is virtually abolished in Ixtapaluca.

Finally, we see that neither the Affective and Cognitive Lability, the Mutualistic Social Schema Factor, nor the Super-K Factor had any significant main effects or interactions with Sample upon the Executive Functions Factor, once statistically controlled for the prior criterion variables.

Interpersonal Aggression. We see from this sixth and final regression equation that the Rule Governance Factor significantly and negatively predicted the Interpersonal Aggression Factor, again as expected by theory. Further, we see that there was a significant parametric difference in the size of this effect between the Arizona and Ixtapaluca samples, with the interaction effect reducing the main effect by nearly three-quarters of its magnitude in Ixtapaluca, without reversing its direction.

We also see that the Executive Functions Factor significantly and negatively predicted the Rule Governance Factor, as expected by theory. Further, we see that there was a significant parametric difference in the size of this effect between the Arizona and Ixtapaluca samples, with the interaction effect augmenting the magnitude of the main effect such that the effect is larger by over one-third in Ixtapaluca, and of course in the same direction.

Finally, we see that the neither the Affective and Cognitive Lability Factor, the Antagonistic Social Schema Factor, the Mutualistic Social Schema Factor, nor the Super-K Factor had any significant main

effects or interactions with Sample upon the Executive Functions Factor, once statistically controlled for the prior criterion variables.

Discussion

We have presented the results of a theoretically specified sequential cascade model, following the consequences of the varying life history strategies of individuals, through the development of various social cognitive schemata (as measured by the DI), their influences upon behavioral self-regulation and rule governance, to the behavioral expression of various forms of interpersonal aggression. We have reported that, with just a few statistically significant parametric differences, in no case reversing the direction of any effects, the hybrid "Dark Violence" model cross-validated reasonably well across two independent and highly discrepant populations, a low-risk University of Arizona undergraduate student convenience sample and a high-risk adult non-student Ixtapaluca community sample collected by the Universidad Autónoma Metropolitana-Iztapalapa.

To summarize, we were not at all surprised that the DT family of personality traits measured by the DI was predictive of interpersonal aggression, although it is always scientifically satisfying to be able to predict behavioral self-reports from attitudinal ones. What these results might imply about the composition of the DI, which was designed to partition the variance among DT traits in a more theoretically motivated manner, were the main foci of our interest. The ASS cluster of the DI represented the critical unique component of the DT in predicting interpersonal

aggression, as expected by theory (Patch, 2014; Jones & Figueredo, 2013); ASS was formerly implicit in the latent common factor underlying the DT, but not discriminable as such (Jonason et al., 2009). The ACL cluster of the DI represented another implicit DT common factor component that was fully mediated by its effects upon executive functions; this enhanced the effect of executive functions upon interpersonal aggression once the ACL component was extracted. The MSS cluster of the DI had no significant direct effects on either executive functions or interpersonal aggression after those of the other two DI factors had been statistically controlled; MSS was not formerly implicit in the DT common factor except as a presumed deficit.

Despite the fact that both populations sampled showed quite similar results psychometrically, the structural differences found might be explained from varying perspectives given that interpersonal violence is a multifactorial phenomenon. Using the nonstudent populations as our focus, one might start by considering the fact that all participants from Ixtapaluca had high school as their maximum level of formal schooling, generally having discontinued their education between the ages of 14 and 15, and consequently may not have achieved their optimal levels of development in certain domains of cognitive ability such as memory, attention, and mathematical processing (e.g., Welsh, Nix, Blair, Bierman, & Nelson, 2010); further, it is reasonable to suppose that the decisions they might subsequently take as adults, and the types of short- and long-term plans that they construct, might be affected by these circumstances, as situated with the context of poverty (Lacour & Tissington, 2011).

Given the context of daily violence in which they live, the following of certain deviant social norms that might develop are likely to promote values such as distrust and lack of cooperation among groups (Wagner & Christ, 2007); such social norms include the "law of the strongest," in which it is better to abuse than be the "fool" who is abused, and in which it is better to attack before being attacked. Further, exposure to constant violence in daily life generates very high levels of tolerance towards aggression, favoring its short- and long-term perpetuation both in the private and public sectors of the community. The violent cycle that follows starts within parental behaviors in the home and is maintained beyond the home throughout adulthood. It was found that 60% of those interviewed in a study parallel to this one (Perez-Ramos, Pérez-Vargas, & Apolinar, 2016), with adult participants having the same sociodemographic characteristics as described here, reported having been the victim of some type of mistreatment by their parents; it was further discovered that their levels of anxiety and uncontrolled anger were directly proportional to the levels of abuse received during childhood. These same adults showed difficulties in discriminating emotions such as anger, surprise, worry, or disgust, which reduced their efficiency in interpersonal relations through a diminished capacity to empathize with the emotions of others (Pérez-Ramos, Pérez-Vargas, & Hurtado, in press); recall that emotional empathy was one of the principal indicators assessed in the present study and these differentials were among the major motivations for comparing high- and low-risk populations so as to better understand the psychometric performance of the DI under varying conditions.

Nevertheless, we conclude that even these striking differences between populations had very minor effects upon our results, and although we give due consideration to the importance of environmental context in the development of "malicious" attitudes and behaviors, it is also evident that our results showed that the DT components assessed by the DI were manifestly present in both groups.

References

- Cohen, J. & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Demetriou, A., Christou, C., Spanoudis, G., & Platsidou, M. (2002). The development of mental processing: Efficiency, working memory, and thinking. *Monographs of the Society of Research in Child Development*, 67, 1–154.
- Ellis, B. J., Figueredo, A. J., Brumbach, B. H., & Schlomer, G. L. (2009). Fundamental dimensions of environmental risk: The impact of harsh versus unpredictable environments on the evolution and development of life history strategies. *Human Nature*, 20, 204–268.
- Figueredo, A. J. (2007). *The Arizona Life History Battery* [Electronic Version]. www.u.arizona.edu/~ajf/alhb.html.
- Figueredo, A. J. & Gorsuch, R. (2007). Assortative mating in the Jewel wasp: 2. Sequential canonical analysis as an exploratory form of path analysis. *Journal of the Arizona Nevada Academy of Science*, 39(2), 59–64.
- Figueredo, A. J. & Jacobs, W. J. (2010). Aggression, risk-taking, and alternative life history strategies: The behavioral ecology of social deviance. In M. Frias-Armenta & V. Corral-Verdugo (Eds), *Bio-psychosocial perspectives on interpersonal violence* (pp. 3–28). Hauppauge, NY: NOVA Science Publishers.
- Figueredo, A. J., Cabeza de Baca, T., Black, C. J., García, R. A., Fernandes, H. B., Wolf, P. S. A., et al. (2014). Methodologically sound: Evaluating the psychometric approach to the assessment of human life history [reply to Copping, Campbell, & Muncer, 2014]. *Evolutionary Psychology: An International Journal of Evolutionary Approaches to Psychology and Behavior*, 13(2), 299–338.
- Figueredo, A. J., Gladden, P. R., & Beck, C. J. A. (2012). Intimate partner violence and life history strategy. In A. Goetz & T. Shackelford (Eds), *The Oxford handbook of sexual conflict in humans* (pp. 72–99, chapter 5). New York: Oxford University Press.
- Figueredo, A. J., Gladden, P. R., & Hohman, Z. (2012). The evolutionary psychology of criminal behavior. In S. C. Roberts (Ed.), *Applied evolutionary psychology* (pp. 201–221, chapter 13). New York: Oxford University Press.
- Figueredo, A. J., Gladden, P. R., Sisco, M. M., Patch, E. A., & Jones, D. N. (2015). The unholy trinity: The Dark Triad, sexual coercion, and Brunswik-Symmetry. *Evolutionary Psychology*, 13(2), 435–454.
- Figueredo, A. J., McKnight, P. E., McKnight, K. M., & Sidani, S. (2000). Multivariate modeling of missing data within and across assessment waves. *Addiction*, 95 (Suppl. 3), S361–S380.
- Figueredo, A. J., Patch, E. A., & Gómez Ceballos, C. E. (2015). A life history approach to the dynamics of social selection. In V. Zeigler-Hill, L. L. M. Welling, & T. K. Shackelford (Eds), *Evolutionary perspectives on social psychology* (pp. 363–372, chapter 29). New York: Springer.
- Figueredo, A. J., Patch, E. A., & Ceballos, C. E. G. (2015). A life history approach to the dynamics of social selection. In V. Zeigler-Hill et al. (Eds), *Evolutionary perspectives on social psychology* (pp. 363–372). New York: Springer International Publishing.

- Figueredo, A. J., Tal, I. R., McNeill, P., & Guillén, A. (2004). Farmers, herders, and fishers: The ecology of revenge. *Evolution and Human Behavior, 25*(5), 336–353.
- Figueredo, A. J., Vásquez, G., Brumbach, B. H., Schneider, S. M., Sefcek, J. A., Tal, I. R., et al. (2006). Consilience and life history theory: From genes to brain to reproductive strategy. *Developmental Review, 26*(2), 243–275.
- Figueredo, A. J., Wolf, P. S. A., Olderbak, S. G., Gladden, P. R., Fernandes, H. B. F., Wenner, C., Hill, D., et al. (2014). The psychometric assessment of human life history strategy: A meta-analytic construct validation. *Evolutionary Behavioral Sciences, 8*(3), 148–185.
- Garcia, R. A., Gladden, P. R., Figueredo, A. J., & Jacobs, W. J. (in preparation). *Aligning one's self within the group: Development of a prospective rule governance scale*. Manuscript in preparation.
- Gioia, G. A., Isquith, P. K., Retzlaff, P. D., & Espy, K. A. (2002). Confirmatory factor analysis of the Behavior Rating Inventory of EF (BRIEF) in a clinical sample. *Child Neuropsychology, 8*, 249–257.
- Giosan, C. (2006). High-K Strategy Scale: A measure of the High-K independent criterion of fitness. *Evolutionary Psychology, 4*, 394–405.
- Gorsuch, R. L. (2016). *UniMult for uni- and multi-variate data analysis*. Altadena, CA: UniMult. www.unimult.com/index.php.
- Gosling, S. D., Rentfrow, P. J., & Swann, W. B. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality, 37*, 504–528.
- Jonason, P. K., Icho, A., & Ireland, K. (2016). Resources, harshness, and unpredictability: The socioeconomic conditions associated with the Dark Triad traits. *Evolutionary Psychology, 14*, 1–11.
- Jonason, P. K., Li, N. P., Webster, G. D., & Schmitt, D. P. (2009). The dark triad: Facilitating a short-term mating strategy in men. *European Journal of Personality, 23*(1), 5–18.
- Jones, D. N. & Figueredo, A. J. (2013). The core of darkness: Uncovering the heart of the Dark Triad. *European Journal of Personality, 27*(6), 521–531.
- Jones, D. N. & Paulhus, D. L. (2011). Differentiating the dark triad within the interpersonal circumplex. In Horowitz, L., Strack, S. (Eds), *Handbook of interpersonal psychology: Theory, research, assessment, and therapeutic interventions* (pp. 249–267). Hoboken, NJ: John Wiley.
- Jones, D. N., Olderbak, S. G., & Figueredo, A. J. (2010). Intentions toward infidelity. In Fisher, T. D., Davis, C. M., Yarber, W. L., & Davis, S. L., (Eds), *Handbook of Sexuality-Related Measures* (3rd ed., pp. 251–253). New York, Routledge.
- Lacour, M. & Tissington, L. D. (2011). The effects of poverty on academic achievement. *Educational Research and Reviews, 6*(7), 522–527.
- Lezak, M. D., Loring, D. W., & Howieson, D. B. (Eds) (2004). *Neuropsychological assessment* (4th ed.). Oxford: Oxford University Press.
- MacArthur, R. H. & Wilson, E. O. (1967). *The theory of island biogeography*. Princeton, NJ: Princeton University Press.
- Mittal, C., Griskevicius, V., Simpson, J. A., Sung, S., & Young, E. S. (2015). Cognitive adaptations to stressful environments: When childhood adversity enhances adult executive function. *Journal of Personality and Social Psychology, 109*, 604–621.
- Mouyi, A. (2006). *Untangling the cognitive processes web*. Paper. Seventh Annual Conference of the International Society for Intelligence Research. San Francisco, CA.
- Olderbak, S. G. & Figueredo, A. J. (2010). Life history strategy as a longitudinal predictor of relationship satisfaction and dissolution. *Personality and Individual Differences, 49*, 234–239.
- Patch, E. A. (2014). *The Dark Inventory Validation Study*. Unpublished Masters Thesis, Department of Psychology, University of Arizona.

- Patch, E. A., Garcia, R. A., Figueredo, A. J., & Kavanagh, P. (Submitted). Social Deviance in Dark Personalities.
- Paulhus, D. L. & Williams, K. M. (2002). The Dark Triad of personality: Narcissism, Machiavellianism, and psychopathy. *Journal of Research in Personality*, 36, 556-563.
- Pérez-Ramos, M., Pérez-Vargas, C., & Hurtado, J. C. (press). Identificación emocional en adultos con y sin maltrato en la infancia. Manuscript in press.
- Pérez-Ramos, M., Pérez-Vargas, C., & Apolinar, H. E. (2016). Consecuencias emocionales en adultos que sufrieron maltrato en la infancia. *Aportaciones Actuales de la Psicología Social*, 3, 764-769.
- Pianka, E. R. (1961). *Theoretical ecology: Principles and applications* (2nd ed.). Oxford: Blackwell Science.
- Pianka, E. R. (1970). On r and K selection. *American Naturalist*, 104, 592-597.
- SAS Institute Inc. (2004). *SAS/STAT*® 9.1 *User's Guide*. Cary, NC: SAS Institute Inc.
- Secretariado Ejecutivo del Sistema Nacional de Seguridad Pública (2012). Estadísticas delictivas por Estados y Municipios. Retrieved October 13, 2012 from [www .estadisticadelictiva.secretariadoejecutivo .gob.mx/mondrian/testpage.jsp](http://www.estadisticadelictiva.secretariadoejecutivo.gob.mx/mondrian/testpage.jsp).
- Tuvblad, C., Bezdjian, S., Raine, A., & Baker, L. A. (2014). The heritability of psychopathic personality in 14 to 15-year-old twins: A multirater, multimeasure approach. *Psychological Assessment*, 26, 704.
- Wagner, U. & Christ, O. (2007). Intergroup aggression and emotions: A framework and first data. In G. Steffgen & M. Gollwitzer (Eds), *Emotions and aggressive behavior* (pp. 133-148). Ashland, OH: Hogrefe & Huber
- Ware, J. E. & Sherbourne, C. D. (1992). The MOS 36-Item Short-Form Health Care Survey (SF-36): I. Conceptual Framework and Item Selection. *Medical Care*, 30, 473-483.
- Welsh, J. A., Nix, R. L., Blair, C., Bierman, K. L., & Nelson, K. E. (2010). The development of cognitive skills and gains in academic school readiness for children from low-income families. *Journal of Educational Psychology*, 102(1), 43.