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Intimate Partner Violence, Interpersonal Aggression, and Life History Strategy

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We integrate life history (LH) theory with "hot/cool" systems theory of self-regulation to predict sexually and socially coercive behaviors, including intimate partner violence (IPV) and interpersonal aggression (IPA). LH theory predicts that a variety of traits form LH *strategies*: adaptively coordinated behavioral clusters arrayed on a continuum from slow to fast. We test structural models examining 2 propositions: (a) "hot" cognitive processes, promoted by faster LH strategies, increase the likelihood of sexually/socially coercive behaviors that make up IPV and IPA; (b) "cool" cognitive processes, promoted by slower LH strategies, buffer against the likelihood of sexually/socially coercive behaviors that make up IPV and IPA. We present single and multisample structural equations models (SEMs and MSEMs) testing hypothesized causal relations among these theoretically specified predictors with IPV and IPA. Study 1 develops a Structural Equation Model for IPV; Study 2 extends the model to IPA using MSEM and provides 5 cross-cultural constructive replications of the findings. Integrat-

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ing LH theory and hot/cool systems analysis of cognitive processes is a promising and productive heuristic for future research on IPV and IPA perpetration and victimization.

Keywords: executive functions, interpersonal aggression, intimate partner violence, life history strategy, mating aggression

Our purpose is to identify psychological mechanisms that contribute to individual differences in the behavioral expression of intimate partner violence (IPV) and interpersonal aggression (IPA).

The Center for Disease Control and Prevention (Breidling, Basile, Smith, Black, & Mahendra, 2015) defines the term intimate partner violence as "physical violence, sexual violence, stalking and psychological aggression (including coercive acts) by a current or former intimate partner (i.e., spouse, boyfriend/girlfriend, dating partner, or ongoing sexual partner)"; in contrast, interpersonal aggression may include any or all of those behaviors but without imposing any definitional restrictions upon the nature of the relationship among the persons involved, whether intimate or otherwise.

There has been a great deal of research into the predictors of various forms of interpersonal aggression in both evolutionary psychology and standard social science. These efforts, however, have been fragmented by the tendency of researchers to specialize in one particular form of interpersonal aggression and develop domain-specific theories to explain them. These disconnected efforts include theories that cover the etiology of general delinquency and criminality (e.g., Capaldi & Patterson, 1996; Ellis & Hoskin, 2015; Gallup, O'Brien, & Wilson, 2011; Hunter, Figueredo, Becker, & Malamuth, 2007; Hinshaw & Lee, 2003; Rowe, Vazsonyi, & Figueredo, 1997; Watt, Howells, & Delfabbro, 2004; Wolke, Copeland, Angold, & Costello, 2013), adolescent perpetration of sexual assault (e.g., Boutwell, Barnes, & Beaver, 2013; Cavanagh Johnson, 1988; Hunter & Figueredo, 2000; Varker, Devilly, Ward, & Beech, 2008), sexual coercion and offending (e.g., Camilleri & Stiver, 2014; Gladden, Sisco, & Figueredo, 2008; Goetz & Shackelford, 2009; Rojas & Gretton, 2007; Seto, Lalumiere, & Kuban, 1999; Sisco & Figueredo, 2008), child physical abuse (e.g., Buss, 2005; Figueredo & McCloskey, 1993; McCloskey, Figueredo, & Koss, 1995; Peterson & Brown, 1994), and intimate partner violence (e.g., Andrews & Bonta, 1998; Barbaro & Shackelford, 2016; Buss, 2005; Buss & Duntley, 2011; Buss & Shackelford, 1997; Easton & Shackelford, 2009; Figueredo & McCloskey, 1993; Figueredo et al., 2001; Figueredo et al., 2009; Kaighobadi & Shackelford, 2009; Kaighobadi, Shackelford, & Goetz, 2009; McCloskey, Figueredo, & Koss, 1995; Mize, Shackelford, & Weekes-Shackelford, 2009; Mize, Shackelford, & Weekes-Shackelford, 2011).

Nevertheless, the success of these various disconnected efforts to empirically identify predictors of the different forms of violence has led to the insight that many (if not most) of these risk factors are domain-general, meaning that they are encountered again and again regardless of which form of antisocial deviance is studied. The interpretation of the causal mechanisms by which these predictors might be operating varies across the domain-specific theories, but the identities of the predictors are largely overlapping.

Although many of these theories seem quite plausible, each of them only appear to account for how the same risk factors might possibly lead to one particular form of interpersonal aggression. None of them provide very convincing explanations for the other pattern that has become undeniable when examining the entire corpus of the data as a whole: Most of the recurring risk factors are quite substantially correlated among themselves. As most of these risk factors involve unfortunate circumstances for the persons of interest, such as states of disadvantage and social and cognitive deficits, it sometimes strains credulity that virtually all of them happen to befall certain highly infelicitous individuals while completely bypassing others somehow more favored by fortune.

We are aware of only one truly comprehensive theory that can account for these various patterns of interconnectedness that have emerged from the data, and that is evolutionary life history theory. The scientific study of the role of life history strategy in interpersonal aggression, however, does not have a very long

history. There were a few major works in the late 20th Century that influenced contemporary thought. Among the first of these were the seminal works of Rushton (e.g., 1985, 1987) that incorporated criminality and homicide within a broadly inclusive conception of life history strategy, associating such violent behavior with more "*r*-selected" (now generally termed "faster") life history strategies. Wilson and Daly (1985) were independently developing parallel theories of youth violence that invoked many predictors now strongly linked to faster life history strategies, such as higher mating effort and increased risk-taking behavior, particularly among males at the age of peak mating competition. Nevertheless, they referred to this suite of behaviors as the "young male syndrome" rather than invoke life history theory directly. Also independent was the work of Belsky, Steinberg, and Draper (1991), followed closely by that of Chisholm and colleagues (1993), that linked antisocial and aggressive behavior in young males to developmental conditions conducive to the development of faster life history strategies.

None of these early research programs, however, explicitly had the connections between life history strategy and interpersonal aggression as their principal foci. This research into the nomological periphery of the problem continued into the early 21st Century. By then, life history strategy had additionally been used to describe a plethora of personality and behavioral traits related to antisocial and aggressive behaviors including: (a) Dark Triad personalities (Jonason, Icho, & Ireland, 2016), (b) risky beliefs and behaviors concerning alcohol and drugs (Hampson, Andrews, Barckley, Gerrard, and Gibbons, 2016), (c) variability in executive function (Mittal, Griskevicius, Simpson, Sung, & Young, 2015), (d) future discounting operationalized as procrastination (Chen & Chang, 2016), and (e) short term mating strategies (Belsky, 2012).

Most recently, researchers have begun to examine criminality directly using a life history lens (e.g., Boutwell, Barnes, Deaton, & Beaver, 2013; Boutwell, Barnes, Beaver, Haynes, Nedelec, & Gibson, 2015). For example, Minkov and Beaver (2016) examined the criminality of 51 countries and found that nations with fewer teenage pregnancies and single parent homes (both indicators of faster LH) have lower reported levels of violent criminality (e.g., assault or mugging). Importantly, they found that a variety of common indicators, such as socioeconomic status, did not predict criminal violence. The same researchers also found that cross-national incidences of homicide were also predicted by nationwide faster LH indicators (Minkov & Beaver, 2016). Nevertheless, this study was conducted at an aggregated population-level of analysis of national homicide rates and not directed to the prediction of individual-level perpetration of aggressive acts.

In the present paper, we show that an integration of principles from cognitive psychology and evolutionary theory identifies potential targets for IPV/IPA interventions and enhances our understanding of IPV and IPA perpetration and victimization (for a recent example of the value of an evolutionary framework in predicting IPV, see Arnocky, Sunderani, Gomes, & Vaillancourt, 2015). We propose and evaluate a domain-general model among various forms of aggression and the hypothesis that no substantial sex differences in the etiology of IPV and IPA exist.

It should be noted that the pivotal construct from which all of our hypothesized causal pathways emanate is that of life history strategy, operationalized as a single latent common factor, and that this conception of human life history has recently become the subject of some scholarly debate (see Copping, Campbell, & Muncer, 2014; Copping, Campbell, Muncer, & Richardson, 2016; Figueredo et al., 2015). Although it is not the purpose of the present paper to review the validity of life history as a psychometric construct, Figueredo and colleagues (2014) have recently published a rather extensive meta-analysis on both the *predictive* ("nomological") and *convergent* validity of the most widely used measures, the Mini-K and the Arizona Life History Battery (ALHB). Olderbak, Gladden, Wolf, and Figueredo (2014) have recently published a more complete treatment of the *construct* validity of the hierarchical latent structure of the Mini-K, the ALHB, and related measures using multiple data sets and applying confirmatory factor analyses (*CFA*) as well as other multivariate methods. Further, Garcia, Cabeza de Baca, Black, Sotomayor-Peterson, Smith-Castro, and Figueredo (2016) recently evaluated a series of hierarchically nested structural equation models (SEM) testing whether a common factor model for human life history strategy outperforms a model that instead arrays the indicators as a developmental sequence, and

finding that a hybrid model that incorporates key elements of both representations is most consistent with the data. Finally, Figueredo, Cabeza de Baca, and Woodley, (2013) have expounded eloquently elsewhere upon the epistemological and methodological rationales underlying the psychometric approach to assessing life history strategy, and Black, Figueredo, and Jacobs (2017) have most recently examined the substance, history, and politics of the conceptual underpinnings of alternative approaches to the entire life history narrative. We therefore refer the reader to these various sources for a more protracted treatment of these issues, as we turn to a consideration of the more proximate causes that have been hypothesized for interpersonal aggression.

The General Theory of Crime, Impulse Control, and the Hot/Cool Theory of Behavioral Self-Regulation

One of the most influential sociological models of crime to date is the general theory of crime (GTC; Gottfredson & Hirschi, 1990) The fundamental claim made by the GTC is that deficits in individual self-control are the primary driving force behind the commission of criminal acts. In this view, individuals with low self-control are more susceptible to committing criminal behavior in response to environmental opportunities than are their more self-controlled counterparts. Also critical to the GTC is the perspective that self-control is an individual difference trait learned via various processes of socialization (e.g., via parenting, educators, social institutions, etc.) Over the years, scholars have critiqued various theoretical assumptions of the GTC. For example, some have argued that self-control may not reflect an individual trait but is instead a situationally dependent trait (Wikstrom & Treiber, 2007). Others have questioned other assumptions of the GTC including: (a) the way crime is defined; (b) the notion that criminal behavior is a form of specialized behavior; and (c) and the extent to which various socialization processes play a role in the onset of criminal behavior (Geis, 2000; Benson & Moore, 1992). Regardless of these theoretical debates and the suggested revisions and/or extensions to the GTC made by several scholars, all versions of the GTC share the same critical underlying assumption: *deficits in self-control, however defined, are a primary risk factor for criminal behavior.* It is beyond the scope of our paper to provide a complete review of the GTC and the various critiques directed at the GTC (for a more comprehensive review, we turn interested readers instead to Bursik, 1988; and Rock, 2006). Although the GTC and its various incarnations point to self-control and the role of the environment in the onset of criminal behavior, these accounts do not provide a complete description of biological mechanisms or functions that underpin an individual's failure to self-control. Biological processes are absent from the GTC and this omission leads implicitly to the assumption that a lack of impulse control is the unitary cause of criminal behavior, while failing to consider the possibility of individual differences in the nature and in the strength of criminal impulses. To extend upon and make sociological accounts of crime like the GTC more conceptually complete, we suggest that it is important to identify excitatory as well as inhibitory individual difference variables with respect to aggressive attitudes and behaviors.

We consider a hot/cool theory of self-regulation as a powerful model for thinking about the biological/neurological processes that may underpin individual self-control. Hot/cool theory describes a suite of cognitive systems that function in self-regulation, both containing combinations of excitatory and inhibitory mechanisms. According to the theory, cool analytic-cognitive systems specialize in regulating planned behavior; hot cognitive-systems specialize in generating impulsive, stimulus-triggered behavior (Metcalfe & Jacobs, 1999a, 1999b). Cool systems permit individuals to guide, monitor, and maintain long-term behavioral goals even when hot responses are triggered. For example, most identified executive functions exhibit cool system characteristics thereby serving a vital role in regulating hot systems (e.g., Harlow, 1868; Mischel et al., 2011).

According to hot/cool theory, biologically relevant stimuli release emotional responses[1] that, in turn, release a suite of behaviors influenced by the

[1] We distinguish between "feelings" as experience in awareness and "emotions," "emotional systems," or "emotional responses" as hot neural systems that contribute to overt behavior but may or may not underpin experience in awareness. As used here, "feelings" and "emotions" are not isomorphic (see e.g., Damasio, 1994; LeDoux, 2015a, 2015b).

emotional responses and affordances (Gibson, 1979) present in the extant environment. An individual deficient in the execution or utilization of cool cognitive-processes (e.g., executive functioning) exhibits predominantly hot stimulus-triggered behavioral strategies (see Metcalfe & Mischel, 1999; Tataryn, Nadel, & Jacobs, 1989). The form of those strategies depends on the structure of the extant environment. Hot/cool theory posits that "cool" systems mediate environmental influences by putting cool systems in partial opposition to behavioral patterns triggered by hot systems; therefore, hot/cool theory models: (a) impulse control, regardless of which system predominates at any given time; and (b) how extant social circumstances influence the specific behavioral tactics exhibited within any given context.

Cool Cognitive Systems

Life history strategy. Life history theory predicts organisms living in harsh, unpredictable environments (i.e., enhanced risk of extrinsic morbidity and mortality) evolve clusters of "fast" life history traits consisting of profligate reproductive rates, minimal parental investment, and relatively brief intergenerational intervals. Fast life history strategists tend to develop antagonistic social schemata in relation to conspecifics, focusing more on instant gratification and less on long-term planning or delayed consequences (e.g., including delayed benefits associated with altruism). Thus, a fast life history strategy may promote a variety of socially deviant behaviors and explain why men are more delinquent or criminal than women (Rowe, 2000; Rowe & Rodgers, 1989; Rowe, Vazsonyi, & Figueredo, 1997).

In contrast, individuals living in safe environmental conditions (i.e., low risk of extrinsic morbidity and mortality) evolve clusters of "slow" life history traits consisting of deliberate reproductive rates, extensive parental investment, and extended intergenerational intervals (Ellis, Figueredo, Brumbach, & Schlomer, 2009). Slow life history strategists develop mutualistic social schemata focused more on long-term plans, stable social relationships, fewer incidents of mental health problems (Giosan & Wyka, 2009; Hurst & Kavanagh, 2017), and expectations of enhanced degrees of reciprocal altruism (Figueredo & Jacobs, 2010). Further, life history related traits tend to cluster into a single "protective" (slow) LH factor that predicts diminished frequencies of self-reported sexually coercive behaviors among college students and fully mediates relations between biological sex of participants and frequencies of sexually coercive behavior (Gladden, Sisco, & Figueredo, 2008).

Executive functions. Another inhibitor of criminal behavior, executive functioning, is positively associated with slow life history (e.g., Wenner, Bianchi, Figueredo, Rushton, & Jacobs, 2013). Executive functions include the abilities entailed in future planning, inhibiting or delaying responding, initiating behavior, and shifting between activities (i.e., cognitive flexibility). Setting goals, plans, sequences, prioritizing, organizing, initiating, inhibiting, pacing, shifting, monitoring, controlling, and completing actions involve executive functions (cf., Lezak, Loring, & Howieson, 2004). Executive functions are central to inhibiting psychopathic attitudes (Patch, Garcia, Figueredo, & Kavanagh, 2016) and antagonistic social behaviors that contribute positively to socially deviant behaviors across a variety of social situations (Wenner, 2010).

Life history strategy, executive functions, emotional intelligence, and sociosexual orientation also correlate (Figueredo, Cuthbertson, Kauffman, Weil, & Gladden, 2012). Executive functions partially mediate the structural relations between: (a) slow life history strategy and short-term mating orientation; and (b) slow life history strategy and emotional intelligence. In addition, emotional intelligence partially mediates structural relations between slow life history strategy and long-term mating orientation. Both slower life history and enhanced general mental ability independently contribute to enhanced levels of executive functioning and drive some of the more specific mental abilities (executive functions) and behavioral predispositions (psychopathic attitudes) that contribute to social deviance across a variety of intrasexual, intersexual, and general social situations (Wenner et al., 2013).

Hot Cognitive Systems

Building on a model proposed by Malamuth (1998), which described how life history strategies impact sexual interest strategies, Figueredo and Jacobs (2010) extended the

thinking beyond sexual to the general social domain. The extended model predicted that, relative to fast life history strategists, slow life history strategists are more prone to mutualistic social strategies and to convergent social behaviors such as reciprocal altruism with kin, nonkin, and romantic partners. Slow life history strategists prefer long-term and cooperative social *and* sexual relationships that are easier and more profitable to maintain in stable, predictable, and controllable environments in which slow life history strategists typically evolve and develop (see Brumbach, Figueredo, & Ellis, 2009; Ellis et al., 2009).

Based upon the mutualistic or antagonistic schemata that fast or slow life histories tend to develop, a cluster of adaptive personality traits also develop. Because fast life history strategists tend to take an antagonistic approach to social relationships, they tend to exhibit behavioral characteristics predictive of socially deviant pursuits (Figueredo & Jacobs, 2010). These traits, which tend to co-occur in individuals, include tendencies toward: (a) diminished law-abidingness (Rushton, 1985); (b) risk taking, impulsive behavior, and poor executive function (Wenner et al., 2013); (c) diminished social and moral rule-following (Gladden, Welch, Figueredo, & Jacobs, 2009); (d) augmented desire for casual sex (Figueredo et al., 2006); (e) enhanced mating effort (Thornhill & Palmer, 2004); and (f) diminished emotional attachment to romantic partners (Gladden et al., 2008).

As part of a generally antagonistic social schema, we predict that fast life history strategists demonstrate increased racist/sexist attitudes and increased socially hostile/aggressive attitudes toward others regardless of group status. Individuals with slower life history strategies exhibit diminished negative ethnocentrism toward multiple perceived social outgroups (see e.g., Figueredo, Andrzejczak, Jones, Smith-Castro, & Montero, 2011) and slower life history individuals report diminished negative androcentrism (Gladden, Figueredo, Andrzejczak, Jones, & Smith-Castro, 2013); therefore, it is plausible that negative androcentrism mediates sexually coercive behavior and, relative to fast life history strategists, slow life history strategists more easily inhibit socially problematical or deviant behavior (e.g., sexual coercion). Given this, we hypothesize that cognitive abilities that inhibit socially undesirable behavior also inhibit negative ethnocentrism and negative androcentrism, and IPV and IPA indirectly, partly by virtue of enhanced executive functioning and emotional intelligence as reported by slower life history strategists.

Theoretical Predictions of the Present Models

Previous work suggests that fast life history strategies, diminished executive functioning/self-control (Rushton, 1985; C. J. Wenner et al., 2013), diminished mate value (Gladden, Figueredo, & Snyder, 2010), increased antagonistic social schemata and socially deviant behaviors (Figueredo & Jacobs, 2010), increased short-term mating orientation, increased mating effort, and increased psychopathic and aggressive attitudes (Gladden, Figueredo, & Jacobs, 2009) are associated.

We propose and test an integrative model to predict IPV specifically, and then propose and test an extension of the model to predict IPA between and within sexes to determine if IPA occurs within the context of sexual, romantic, or both kinds of relationships. We tested the generalized model with five independent cross-cultural constructive replications obtained from Australia, Italy, Mexico, Singapore, and the U.S.A. These path models included measures of executive functions, perceived mate value, antagonistic social schemata (including culture of honor), short-term mating orientation, and psychopathic and aggressive attitudes as mediators of the relations observed among life history strategies and specific IPV (Study 1) and general IPA (Study 2). We integrate life history theory and hot/cool theory of self-regulation (Metcalfe & Jacobs, 1999a, 1999b; Metcalfe & Mischel, 1999) to predict the occurrence of socially and sexually coercive behaviors that encompass IPV and IPA.

The present study tests a model originally developed to predict IPV (Figueredo, Gladden, & Beck, 2010), then tests a derivative model to ascertain if it predicts general IPA outside of sexual and romantic relationships. We subject the second model to five cross-cultural replications.

Our secondary aim is to determine whether an antagonistic social schema serves as a partial mediator between life history strategy and IPA in the structural model. We hypothesize that the

construct representing an antagonistic social schema takes a place formerly held by a culture of honor revenge ideology in a previously developed intimate partner violence model (Figueredo, Gladden, & Beck, 2010). In the second study, culture of honor was not modeled as a direct causal influence.

The predictions tested in these studies are: (a) slower life history strategies produce lower levels of IPV and IPA; and (b) the dynamic balance among the relative degrees to which hot and cool cognitive processes are implemented mediate this effect. More specifically, we predict that lower executive functioning, lower mate value assessment, enhanced antagonistic social strategies, enhanced short-term mating orientations, enhanced culture of revenge ideology, and enhanced psychopathic and aggressive attitudes, mediate the inhibitory effects of slower life history strategy on the occurrence of IPV and IPA.

Method

Participants

Study 1: IPV. Two hundred and 64 undergraduates enrolled in introductory psychology courses in a major Southwestern (U.S.A.) university participated. The final analyses were conducted with 231 of these participants because of nonrecoverable missing data. To participate in Study 1, participants must have been involved in a romantic relationship for at least three months. Participants received class credit for participating in the studies and were properly debriefed after completion. Most assessments of IPV (e.g., Conflict Tactics Scales—Revised (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996), Relationship Behavior Rating Scale - Revised (RBRS-R; Beck, Menke, & Figueredo, 2013)), ask participants to estimate the number of specified categories of aggressive or violent acts that occurred within the past year. In addition, they ask for estimates of aggressive or violent acts that occurred within the context of a "primary" romantic relationship. To avoid biasing our sample toward overrepresenting longer-term relationships (>12 months), we calculated the annualized frequencies of the items for the shorter-term relationships (<12 months), which corrected for the reported length of each relationship and avoided underestimating the rate of occurrence.

Study 2: IPA. Seven hundred thirty-eight undergraduate students enrolled in introductory psychology courses from universities located in Australia, Italy, Mexico, Singapore, and the U.S.A. participated. The final analyses were conducted using 534 of these participants because of nonrecoverable missing data. To participate in Study 2, no minimal relationship criteria were required. The mean ages for all five cross-national samples were between 19 and 32 years, and were largely female, with the percentages of female respondents ranging from 66% to 80%. Table 1 displays the breakdown of participants by cross-cultural constructive replication, with and without sufficiently complete data for multivariate analysis. The University of Arizona provided IRB approval for the procedures used with human participants in all five cross-cultural sites, in addition to those provided by local authorities at participating institutions.

Procedures

In Studies 1 and 2, and the five cross-cultural replications, participants completed several self-report questionnaires measuring life-history strategies, executive functioning, mating strategies, mate values, mating effort, revenge ideologies, psychopathic and aggressive attitudes, and potentially violent behavioral interactions.

For Study 1, participants reported the number of coercive, aggressive, and possibly violent behavioral interactions with their intimate romantic partner over the past year. For Study 2, participants reported the number of coercive, aggressive, and possibly violent behavioral interactions with people of the same and opposite sex (if they were intimate romantic partners or

Table 1
Sample Sizes for the Five Cross-Cultural Constructive Replications (Study 2)

Cross-cultural replication	Total initial *N*	Final sample with complete data
Australia (AU)	131	100
Italy (IT)	172	93
Mexico (MX)	160	96
Singapore (SG)	115	99
United States of America (US)	160	146

not) over the past year. Participants enrolled in the study provided informed consent and completed the questionnaires via a secured Internet website.

Measures

Every subscale and composite measure used was aggregated *separately* for each of the cross-cultural samples, with the exception of the two higher-order latent common factors that were explicitly constructed and tested within the structural equation models, as they were relatively novel constructs requiring more protracted examination. Every subscale and composite measure used was then evaluated for both internal consistency and convergent validity (where applicable) *separately* for each of the cross-cultural samples.

Tables 2 and 3 display the Cronbach's alphas and unit-weighted factor loadings (part-whole correlations) for each scale containing two or more subscales for Study 1; Tables 4 and 5 report the same for Study 2. We report unitary scales in the main text of this section, listed alphabetically by cross-cultural constructive replication with the following subscripts: AU = Australia; IT = Italy; MX = Mexico; SG = Singapore; and US = United States of America.

One might therefore note that in spite of the completely independent estimation of psychometric parameters across the study populations, these tables show a remarkable degree of cross-cultural similarity among the internal consistencies and convergent validities of the preponderance of our subscales and composite measures. Across all five cross-cultural replications, these internal consistencies and convergent validities were remarkably good and reasonably stable.

Life history strategy. The Arizona Life-History Battery (ALHB; Figueredo, 2007), a battery of cognitive and behavioral indicators of LH strategy compiled and adapted from various original sources measured LH strategy. The ALHB was scored and aggregated directionally to indicate a slow (high-*K*) LH strategy before multivariate analysis.

Table 2
Internal Consistency Reliabilities and Unit-Weighted Factor Structures for Predictors of IPV (Study 1)

Scale/Subscale	Cronbach's alpha	Part–whole correlations
The Arizona Life History Battery (ALHB)		
Mini-K short form	.75	.82*
Insight, planning, and control	.88	.64*
Parental relationship quality	.91	.57*
Family contact and support	.92	.68*
Friends contact and support	.88	.53*
Romantic partner attachment	.93	.42*
General altruism	.92	.67*
Religiosity	.96	.41*
Executive functions (BRIEF-A Behavioral Regulation Scales)		
Emotional control	.95	−.85*
Inhibiting	.90	−.88*
Self-monitoring	.95	−.88*
Shifting	.90	−.90*
The Multidimensional Sociosexual Orientation Inventory (MSOI)		
Long-term mating	.91	−.84*
Short-term mating	.92	.84*
The Levenson Self-Report Psychopathy Scales (LSRP)		
Primary psychopathy	.85	.94*
Secondary psychopathy	.70	.83*
The Reactive-Proactive Aggression Questionnaire (RPQ)		
Proactive aggression	.92	.93*
Reactive aggression	.85	.90*

* $p < .05$.

Table 3
Internal Consistency Reliabilities and Unit-Weighted Factor Structures for Convergent Measures of IPV (Study 1)

Scale/Subscale	Cronbach's alpha	Part–whole correlations
The Conflict Tactics Scales–revised (CTS2): Perpetration		
Psychological perpetration	.87	.88*
Physical perpetration	.96	.98*
Escalated perpetration	.97	.96*
Sexual perpetration	.87	.94*
The Conflict Tactics Scales–revised (CTS2): Victimization		
Psychological victimization	.86	.87*
Physical victimization	.97	.98*
Escalated victimization	.97	.96*
Sexual victimization	.88	.94*
The Relationship Behavior Rating Scale–Revised (RBRS-R): Victimization		
Psychological victimization	.91	.79*
Physical victimization	.94	.95*
Escalated victimization	.99	.95*
Sexual victimization	.90	.96*

* $p < .05$.

Executive functioning. Thirty items from the Behavioral Regulation Scales (BRS) of the Behavior Rating Inventory of Executive Function - Adult version (BRIEF-A; Gioia, Isquith, Retzlaff, & Espy, 2002), were used to measure behavioral inhibition, cognitive inhibition, and behavioral regulation. Participants use a 7-point scale (0 = *never*; 6 = *almost always*) to describe problem severity for each behavior over the past month. Example items include: "I overreact emotionally" (emotional control); "I tap my fingers or bounce my legs" (inhibition); "I don't think about consequences before doing something" (self-monitoring); and "I have trouble changing from one activity or task to another" (set shifting). All items were reverse-scored to indicate better behavioral regulation.

Mate value. The 22-item Mate Value Inventory (MVI; Kirsner, Figueredo, & Jacobs, 2003) measured self-perceived mate value. Participants rated the degree to which a number of relationship qualities (e.g., "emotionally stable," "loyal," "attractive face") are characteristic of them in comparison to their peers on a 7-point scale (−3 = *extremely low on this characteristic*; +3 = *extremely high on this characteristic*). The Cronbach's alphas were $\alpha = .86$ for Study 1 and $\alpha_{AU} = .75$, $\alpha_{IT} = .68$, $\alpha_{MX} = .88$, $\alpha_{SG} = .86$, and $\alpha_{US} = .75$ for Study 2.

Antagonistic social schemata (ASS). To obtain a measure of antagonistic social schemata, we adapted the 75-item Young Schema Questionnaire - Short Form (YSQ-S2; Young & Brown, 1999), which was originally designed to determine which domain-specific "Early Maladaptive Schemas" (*sic*) a schema therapy patient is using. Life history theory predicts that 13 of the purportedly domain-specific subscales of the YSQ-S2 comprise a single higher-order common factor. We thus excluded Self-Sacrifice and Unrelenting Standards/Hypercriticalness scales from the original 15 subscales because they are theoretically inconsistent with the predicted effects of fast life history strategy. We extracted a single general factor designed to measure antagonistic social schemata from the remaining subscales (5 items per scale) of the YSQ-S2: Emotional Deprivation; Abandonment/Instability; Mistrust/Abuse; Social Isolation/Alienation; Defectiveness/Shame; Failure; Dependence/Incompetence; Vulnerability to Harm or Illness; Enmeshment/Undeveloped Self; Subjugation; Emotional Inhibition; Entitlement/Grandiosity; and Insufficient Self-Control/Self-Discipline. Participants described behaviors and characteristics on a 6-point scale (1 = *completely untrue of me*; 6 = *describes me perfectly*).

Culture of honor. The cross-culturally validated Culture of Honor Revenge Scale (COHRS; Figueredo, Tal, McNeil, & Guillén, 2004) is a 16-item measure of acceptance of

Table 4
Internal Consistency Reliabilities and Unit-Weighted Factor Structures for Predictors of IPA (Study 2) in Australia (AU), Italy (IT), Mexico (MX), Singapore (SG), and the United States of America (US)

Scale/Subscale	Cronbach's alpha					Part–whole correlations				
	AU	IT	MX	SG	US	AU	IT	MX	SG	US
The Arizona Life History Battery (ALHB)										
Mini-K short form	.76	.66	.85	.73	.72	.83*	.81*	.78*	.76*	.81*
Insight, planning, and control	.91	.85	.95	.88	.89	.64*	.58*	.77*	.54*	.63*
Parental relationship quality	.90	.90	.94	.85	.90	.60*	.61*	.61*	.70*	.49*
Family contact and support	.91	.92	.89	.94	.92	.60*	.60*	.59*	.52*	.62*
Friends contact and support	.90	.88	.90	.86	.90	.40*	.50*	.61*	.43*	.58*
Romantic partner attachment	.93	.92	.89	.92	.91	.40*	.44*	.39*	.30*	.38*
General altruism	.92	.90	.94	.93	.90	.70*	.72*	.68*	.57*	.66*
Religiosity	.95	.95	.96	.96	.95	.22*	.44*	.58*	.37*	.47*
Executive functions (BRIEF-A Behavioral Regulation Scales)										
Emotional control	.92	.93	.92	.93	.94	−.83*	−.85*	−.93*	−.87*	−.85*
Inhibiting	.73	.82	.78	.82	.84	−.83*	−.90*	−.92*	−.84*	−.85*
Self-monitoring	.77	.89	.83	.85	.91	−.83*	−.86*	−.93*	−.86*	−.87*
Shifting	.78	.75	.80	.76	.87	−.83*	−.88*	−.91*	−.90*	−.88*
Antagonistic social schema (YSQ-S2)										
Emotional deprivation (ysqed)	.93	.89	.88	.87	.90	.59*	.65*	.67*	.56*	.64*
Abandonment/Instability (ysqab)	.92	.90	.90	.92	.94	.59*	.57*	.75*	.55*	.69*
Mistrust/Abuse (ysqma)	.94	.88	.85	.89	.93	.79*	.72*	.72*	.65*	.78*
Social isolation/Alienation (ysqsi)	.94	.90	.88	.93	.92	.82*	.74*	.79*	.67*	.78*
Defectiveness/Shame (ysqds)	.97	.94	.90	.95	.94	.83*	.70*	.83*	.82*	.83*
Failure (ysqfa)	.95	.91	.95	.94	.90	.78*	.62*	.82*	.70*	.79*
Dependence/incompetence (ysqdi)	.81	.85	.85	.85	.86	.79*	.72*	.85*	.72*	.84*
Vulnerability to harm or illness (ysqvh)	.86	.80	.79	.90	.86	.77*	.62*	.73*	.76*	.79*
Enmeshment/Undeveloped self (ysqem)	.82	.81	.75	.87	.89	.58*	.56*	.68*	.60*	.77*
Subjugation (ysqsb)	.88	.79	.86	.86	.90	.79*	.77*	.80*	.79*	.85*
Emotional inhibition (ysqei)	.91	.95	.83	.88	.90	.78*	.50*	.67*	.70*	.77*
Entitlement/Grandiosity (ysqet)	.78	.79	.80	.84	.82	.40*	.50*	.53*	.44*	.53*
Insufficient self-control/Self-discipline (ysqis)	.87	.85	.77	.89	.85	.65*	.61*	.71*	.58*	.65*
The Multidimensional Sociosexual Orientation Inventory (MSOI)										
Long-term mating	.92	.92	.89	.93	.94	−.81*	−.84*	−.79*	−.85*	−.84*
Short-term mating	.89	.87	.89	.86	.92	.81*	.84*	.79*	.85*	.84*
The Levenson Self-Report Psychopathy Scales (LSRP)										
Primary psychopathy	.84	.87	.80	.85	.87	.89*	.92*	.93*	.90*	.94*
Secondary psychopathy	.72	.54	.64	.70	.73	.77*	.67*	.78*	.70*	.79*
The Reactive-Proactive Aggression Questionnaire (RPQ)										
Proactive aggression	.83	.78	.91	.90	.92	.84*	.87*	.92*	.93*	.94*
Reactive aggression	.86	.81	.88	.87	.86	.93*	.93*	.92*	.91*	.92*

* $p < .05$.

revenge ideology. Participants rated items such as "A man sexually assaulted Mary's sister. Mary then shot the man who did it." on a 7-point scale (−3 = *did much less than he or she should have done*; +3 = *did much more than he or she should have done*). Cronbach's alphas were $\alpha = .86$ for Study 1 and $\alpha_{AU} = .91$, $\alpha_{IT} = .87$, $\alpha_{MX} = .93$, $\alpha_{SG} = .91$, and $\alpha_{US} = .90$ for Study 2.

Short-term sociosexual orientation. The Multidimensional Socio-Sexual Orientation Inventory (MSOI; James-Jackson & Kirkpatrick, 2007), a two-dimensional measure, consisting of two (10-item) negatively correlated subscales (preferences for short- and long-term mating) rated on 7-point scales (−3 = *strongly disagree*; +3 = *strongly agree*) measured short- and long-term mating preferences. Short-term mating preference scale examples include: "I believe in taking sexual opportunities when I find them" and "Sometimes I'd rather have sex with someone I didn't care about." Long-term

Table 5
Internal Consistency Reliabilities and Unit-Weighted Factor Structures for Convergent Measures of IPA (Study 2) in Australia (AU), Italy (IT), Mexico (MX), Singapore (SG), and the United States of America (US)

Scale/Subscale	Cronbach's alpha					Part–whole correlations				
	AU	IT	MX	SG	US	AU	IT	MX	SG	US
The Interpersonal Relations Rating Scale (IRRS): Opposite-sex aggression										
Opposite-sex coercive control	.86	.85	.87	.91	.93	.93*	.88*	.82*	.95*	.94*
Opposite-sex psychological abuse	.80	.83	.87	.87	.91	.74*	.78*	.80*	.84*	.81*
Opposite-sex physical abuse	.84	.78	.88	.93	.92	.87*	.83*	.89*	.95*	.92*
Opposite-sex escalated abuse	.98	.96	.96	.98	.97	.92*	.86*	.83*	.95*	.94*
Opposite-sex sexual abuse	.93	.79	.83	.94	.93	.92*	.87*	.90*	.97*	.94*
The Interpersonal Relations Rating Scale (IRRS): Same-sex aggression										
Same-sex coercive control	.91	.87	.89	.93	.93	.95*	.88*	.88*	.95*	.96*
Same-sex psychological abuse	.83	.77	.83	.88	.91	.76*	.76*	.76*	.86*	.79*
Same-sex physical abuse	.97	.83	.86	.95	.92	.96*	.80*	.88*	.95*	.95*
Same-sex escalated abuse	.98	.97	.94	.98	.97	.97*	.88*	.95*	.96*	.93*
Same-sex sexual abuse	.96	.90	.85	.95	.94	.96*	.87*	.90*	.98*	.96*
Mating aggression										
Mate guarding scale	.84	.86	.75	.92	.91	.78*	.66*	.78*	.83*	.85*
Mate retention inventory	.97	.97	.98	.98	.99	.84*	.83*	.82*	.85*	.88*
Intrasexual competition scale	.92	.91	.89	.93	.91	.77*	.75*	.78*	.67*	.82*
Competitor derogation tactics	.96	.97	.99	.99	.99	.82*	.75*	.76*	.81*	.86*

* $p < .05$.

mating preference scale examples include: "I hope to have a romantic relationship that lasts the rest of my life" and "I can see myself settling down romantically with one special person." We aggregated the two subscales directionally to indicate preference for short-term over long-term mating by reverse-scoring the long-term mating preference subscale.

Psychopathic and aggressive attitudes (PAA). Psychopathic attitudes and behaviors consist of a constellation of traits that promote antisocial interactions. These include relatively early onset of aggression, lack of emotional empathy, lack of remorse or guilt, impulsivity, dishonesty, and unrestricted sociosexuality (Lalumière, Mishra, & Harris, 2008; Mealey, 1995). Mealey (1995) proposed that this cluster of traits is a specialized *set* of tactics selected as a "cheater" strategy, allowing psychopaths to selfishly capitalize on prosocial cooperators. Although some researchers distinguish between instrumental (proactive) and reactive aggression (e.g., Raine et al., 2006), both instrumental and reactive aggression are relevant to IPV and IPA. IPV appears motivated by revenge, anger, or hostility (reactive aggression) and supported by the control or coercion it produces (instrumental aggression). Hence, we do not distinguish general dispositions toward proactive or reactive aggression here. Likewise, a distinction between primary and secondary psychopathy (e.g., Hare, 2003) is unimportant in the present context given the strong correlations between measures of these two facets and that both primary and secondary psychopathy are potentially involved in IPA and IPV. Hence, we do not distinguish between general dispositions toward primary or secondary psychopathy. Finally, the psychopathic and aggressive attitudes construct contains a measure of mating effort as (Lalumière & Quinsey, 1996) demonstrated that psychopathy predicts mating effort, short-term mating, number of sexual partners per sexually active year, and sexual coercion.

Three convergent measures assessed psychopathic and aggressive attitudes: a two-dimensional measure of psychopathy (Levenson Self-Report Psychopathy (LSRP) scale; (Levenson, Kiehl, & Fitzpatrick, 1995)); a two-dimensional measure of generally aggressive dispositions (Reactive and Proactive Aggression Questionnaire (RPAQ); (Raine et al., 2006); and a one-dimensional measure assessing mating effort (Mating Effort Scale (MES); Rowe et al., 1997).

The LSRP scale is a two-dimensional measure of psychopathy. The first 16-item subscale

measures primary psychopathy; the second 10-item subscale measures secondary psychopathy. Participants indicated their level of agreement with items such as "I enjoy manipulating other people's feelings" (primary) and "I find myself in the same kinds of trouble, time after time" (secondary) on a 5-point scale (−2 = *strongly disagree*; +2 = *strongly agree*).

The RPAQ, a 23-item two-dimensional instrument, was used to measure reactive (10 items) and proactive (13 items) aggression. Participants rated how often they engaged in various aggressive behaviors on a 4-point scale (0 = *never*; 3 = *always*). Example items include: "Reacted angrily when provoked by others" (reactive aggression) and "Had fights with others to show who was on top" (proactive aggression).

The MES, a 10-item measure of self-reported time and energy allocated toward obtaining and retaining sexual partners, measured mating effort. Participants rated items such as: "I like boys more for their good looks than for their companionship" and "If other boys think I am 'tough,' they will stay away from my girlfriend" on a 5-point scale (−2 = *strongly disagree*; +2 = *strongly agree*). The Cronbach's alphas were $\alpha = .76$ for Study 1 and $\alpha_{AU} = .75$, $\alpha_{IT} = .72$, $\alpha_{MX} = .83$, $\alpha_{SG} = .76$, $\alpha_{US} = .76$ for Study 2.

Intimate partner and interpersonal aggression, violence, and abuse. We used three scales to measure intimate partner violence and interpersonal aggression: Conflict Tactics Scales - Revised (CTS2; Straus et al., 1996) measured perpetrating and receiving intimate partner psychological abuse, physical and sexual violence; the Relationship Behavior Rating Scale Revised (RBRS-R; Beck et al., 2013) measured intimate partner psychological abuse, physical and sexual victimization by a relationship partner; the Interpersonal Relations Rating Scale (IRRS; Figueredo, Gladden, & Beck, 2010) measured same-sex and opposite sex interpersonal aggression.

The 78-item CTS2 included items such as: "I twisted my partners arm or hair" and "I destroyed something belonging to my partner" rated on a 7-point scale (0 = *this never happened*; 6 = *more than 20 times in the past year*). Half of the items ask how often the participants perpetrated each action and half how often they were the victim of each action. Ten subscales were constructed, five for perpetration and five for victimization; eight of which (excluding the two negotiation subscales for perpetration or victimization) were aggregated into a CTS perpetration scale and a CTS victimization scale before factor analytic structural equations modeling.

The 47-item RBRS-R asks participants how often each described behavior occurred in the past 12 months (e.g., "My partner put me down" and "My partner threw objects at me.") on a 6-point scale (0 = *never*; 5 = *daily*). We constructed five victimization subscales (psychological, physical, escalated, sexual, and coercive control), with the first four aggregated into an RBRS-R Victimization Scale before factor analytic structural equations modeling.

We constructed the Interpersonal Relations Rating Scale (IRRS) as a measure of the participant's psychological and physical aggression toward same- and opposite sex (romantic partners or not). The IRRS contained parallel items for same- and opposite sex victims of IPA, constructed to be equivalent to the corresponding items on one of the measures (RBRS-R) that we used. The differences were that the IRRS asked participants' *perpetration* of victimization by these various acts, without limiting the report to interactions with romantic partners or with *any particular individual*. We adopted this modification to account for the idea that most individuals with tendencies toward shorter-term relationships often have multiple and, at times, overlapping short-term relationships. The IRRS was designed to capture that and to accommodate longer and more committed romantic relationships. The IRRS therefore asked participants to report aggregate aggressive acts across all opposite- and same-sex individuals with whom they interacted during the past year, regardless of numbers or identities.

If a general tendency toward relationship aggression in certain individuals is being measured, then this will show up in *all* relationships. By asking participants to report opposite- and same-sex targets of aggression separately, we obtain estimates of intersexual and intrasexual aggression, which permits us to see if a general tendency toward aggression in social relationships generalizes across the targets' sex. By aggregating across multiple social and sexual relationships this way, the *IRRS* avoids norming all rates of aggressive and violent behavior by

the length of a particular relationships or with social or sexual partners.

The 94-item IRRS asked participants to rate how often each described behavior occurred in the past 12 months on a 6-point scale (0 = *never*; 5 = *daily*). The scale contains 47 parallel items for same-sex victims of interpersonal aggression, aggregated into an IRRS-S scale, and 47 parallel items for opposite sex victims of interpersonal aggression, aggregated into an IRRS-O scale. The items were constructed to be otherwise equivalent to items on the RBRS-R, except a) they asked participants to report perpetration rather than victimization, and b) the questions were not limited to romantic partners. The IRRS-S scale items includes: "I put down a member of my same sex" and "I threw objects at a member of my same sex." The IRRS-O scale items includes: "I put down a member of the opposite sex" and "I threw objects at a member of the opposite sex." We constructed five subscales for each IRRS perpetration scale, equivalent to those of the RBRS-R victimization scale.

Mating aggression. Consistent with the evolutionary-psychological idea that most interpersonal aggression is ultimately motivated by sexual/mating concerns, we included four mating-aggression scales to assess their level of psychometric convergence with generalized IPA, and provide a link to previous work on IPV. The scales include measures of sexual-rival derogation (Buss & Dedden, 1990), generalized intrasexual competition (A. P. Buunk & Fisher, 2009), mate guarding (B. P. Buunk, 1997), and mate retention tactics (Buss, 1989). The aggressive mating behaviors selected for study constitute *strategic interference* with an individual's intended sexual partner and perceived sexual rival(s). These strategies are directed toward same- and opposite sex targets, both are victims of aggressive mating behaviors. We predicted that the four scales comprise a single common factor and that the compilation of these four scales measured mating aggression. These scales reflect strategic interference with an individual's intended sexual partner and perceived sexual rivals, both of whom may be direct or indirect targets of aggressive and violent behaviors.

An 8-item Mate Guarding Scale (MGS; B. P. Buunk, 1997), designed to measure possessive jealousy or degree of vigilance to prevent free mate choice, measured mate guarding. Response options, which range from 1 (*not at all applicable*) to 5 (*very applicable*), included: "I don't want my partner to meet too many people of the opposite sex" and "I demand from my partner that he/she does not flirt with other men/women."

A 104-item Mate Retention Inventory (MRI; Buss, 1989) assessed the number of behaviors aimed at keeping or guarding a mate from rivals occurred in the past year (i.e., preventing mate choice of others *and* intrasexual competition). Response options (0 = *never*; 5 = *daily*), included, "Kissed an opposite-sex person when other same-sex people were around" and "Made an opposite-sex person feel guilty about talking to another man."

An Intrasexual Competition Scale (ICS; A. P. Buunk & Fisher, 2009) measured participants' degree of intrasexual competitiveness. The 12-item ICS includes items for each sex such as "I can't stand it when I meet another man who is more attractive than I am" (for men) and "I want to be just a little better than other women" (for women) rated on a 7-point scale (1 = *not at all applicable*; 7 = *completely applicable*).

An 83-item Competitor Derogation Tactics Scale (CDT; Buss & Dedden, 1990) measured intrasexual competitiveness through (mostly) verbal derogation of same-sex rivals. Participants rated how often s/he derogated a person of their same sex during the past year (e.g., "I spread false rumors about a same-sex person as myself" and "I told an opposite-sex person that the other same-sex person as myself was a wimp.") on a 6-point scale (0 = *never*; 5 = *daily*).

Data Analyses

Scoring IPV and IPA scales. All item responses for the five Likert-scaled response options on RBRS-R and two IRRS scales were converted to their numerical equivalents representing the expected number of occurrences per year, so that "*never*" = 0, "*only once*" = 1, "*6 times*" = 6, "*12 times*" = 12, "*once a week*" = 52, and "*daily*" = 365, adapting and applying the same principles recommended for estimating annualized frequencies in the CTS2 (Straus et al., 1996) to estimate annualized frequencies.

For Study 1, which used the RBRS-R Victimization scale for IPV, we transformed the length of

each relationship to total months, *m*, and multiplied 12/*m* to annualize the estimated frequencies of each item. We imposed a lower limit of inclusion criterion 3 months for the minimum length of relationship to ensure there was sufficient time for the targeted behavior occur. We computed the natural (Naperian) logarithms of the estimated annualized item frequencies (adding 1, to avoid calculating the undefined natural logarithm of 0) to restore the nonlinear nature of the original scales, which are divided into unequal intervals of increasing magnitudes.

For Study 2, which used the IRRS Perpetration scales for IPA, we estimated the log-transformed annualized rates for IRRS items as we did for RBRS-R items; no corrections for differing lengths of romantic relationships were required.

To score the CTS2, we constructed and psychometrically validated five theoretically specified subscales, using the log-transformed annualized frequencies aggregated within each of five categories of intimate partner and general interpersonal aggression: (a) coercive control, (b) psychological abuse, (c) physical abuse, (d) escalated (i.e., life-threatening) abuse, and (e) sexual abuse. We then used these five subscales to create general scales by unit-weighted factor scoring (Gorsuch, 1983). Giving roughly equal weight to each of the five subscales circumvented the overrepresentation of more moderate forms of abuse (e.g., psychological abuse) found in the CTS2 (see e.g., Figueredo, Montero-Rojas, et al., 2009; Tanha, Beck, Figueredo, & Raghavan, 2010).

The CTS2 and RBRS-R scales were constructed hierarchically from their respective subscales. To compare the two measures directly, we only included the Psychological, Physical, Escalated ("injury"), and Sexual subscales that appear on the CTS2 and RBRS-R. We excluded the Negotiation subscale of the CTS2 and the Coercive Control subscale of the RBRS-R from the common factor model because they are not directly comparable and do not measure aggressive behavior.

Statistical models. All univariate and multivariate analyses were performed using SAS 9.1 (SAS Institute Inc., 2004) and EQS 6.1 (Bentler, 1995). Because of our sample size, we could not analyze all of the individual subscales within a single multivariate model. Thus, a hierarchical analytical strategy was used. Unit-weighted common factor scales (Gorsuch, 1983) were estimated, using SAS PROC STANDARD and DATA, as the means of the standardized scores for all nonmissing subscales on each factor (Figueredo, McKnight, McKnight, & Sidani, 2000). We also computed the Cronbach's alphas and the covariance matrices of the subscales using SAS PROC CORR, 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 multivariate causal analysis within a single structural equation model.

Structural equations modeling (SEM) using EQS 6.1 provided a multivariate causal analysis of the measurement and structural relations among these constructs. SEM results were evaluated using a chi-square statistic, the Bentler-Bonett normed fit index (*NFI*), the Bentler-Bonnett comparative fit index (*CFI*), and the root mean squared error of approximation (*RMSEA*). The *CFI* was selected because it is adjusts for model parsimony and performs well with moderate to small sample sizes ($N < 250$), especially with maximum likelihood estimation (Bentler, 1990; Hu & Bentler, 1995).

The adequacy of the structural model was analyzed applying a multisample analysis (Bentler, 1995; Byrne, 1994). The multisample structural equation models (MSEMs) were constructed based on a priori theoretical predictions, and the within-sample and cross-sample equality constraints that could and could not be imposed (based on their adverse effects on model fit to the data) were determined empirically by means of hierarchically nested model comparisons.[2]

[2] The absolute size of each of our combined multiple samples must be considered in terms of the relative complexity or parsimony of the model tested. The recommended ratio is at least five cases for every structural parameter freely estimated in confirmatory models (Bentler, 1995). In the case of Study 1, a sample size of $N = 231$ usable cases could therefore in principle support the estimation of $k = 46$ model parameters according to this ratio. The fully constrained restricted model tested with the present data, with all cross-sample equality constraints imposed across sex of respondent, contained $k = 31$ free model parameters to be estimated, which falls within that recommended limit. In the case of Study 2, a sample size of $N = 534$ usable cases could in principle support the estimation of $k = 107$ model parameters. The fully constrained restricted model tested with the present data, with all cross-sample equality constraints imposed across sex of respondent, contained $k = 34$ free model parameters to be estimated, which falls within the recommended limit.

Results

Study 1: IPV

Cross-sample equality constraints. The MSEM with full cross-sample equality constraints imposed across sex of respondent was not acceptable by strict statistical criterion, but was acceptable by practical and parsimonious indicators of goodness-of-fit and by *RMSEA* ($\chi^2_{88} = 141.44$, $p < .05$, *NFI* = .92, *CFI* = .97, *RMSEA* = .07). The MSEM with all cross-sample equality constraints across sex of respondent lifted was not acceptable by statistical criterion, but was acceptable by practical and parsimonious indicators of goodness-of-fit and *RMSEA* ($\chi^2_{70} = 123.82$, $p < .05$, *NFI* = .93, *CFI* = .97, *RMSEA* = .08). The difference between the two hierarchically nested models was not statistically significant ($\chi^2_{18} = 17.63$, $p > .05$, *NFI* = −.01, *CFI* = .00, *RMSEA* = −.01) or of any practical importance in magnitude, so, based on parsimony, we retained the fully constrained model. Given that the null hypothesis - all model parameters were statistically equivalent across the sexes of the respondents - could not be rejected, no statistically significant parametric sex differences in the modeled etiology of IPV occurred. This means that our predictive model was consistent across sexes of respondent.

Figure 1 displays the results of the fully constrained model.[3] Asterisks (*) indicate all path coefficients (effect sizes) that differ significantly from zero ($p < .05$). Reported standardized regression coefficients (λ-weights or β-weights) for the measurement and structural pathways were estimated by maximum likelihood (*ML*).

The measurement model. The PAA factor and the IPV factors were higher-order latent variables constructed explicitly within the MSEM. These higher-order factors were of particular theoretical interest because they were hypothesized to be indicated by multiple heterogeneous measures, whereas the aggregation of subscales within each of battery of homogeneous measures described above was relatively uncontroversial. Nevertheless, both the PAA and IPV factors showed remarkably good convergence.

Our explicit measurement model for the psychopathic and aggressive attitudes factor included the LSRP, the RPAQ, and the MES. Our explicit measurement model for the IPV factor included the CTS2 Perpetration scale, the CTS2 Victimization scale, and RBRS-R Victimization scale. A residual correlation was also specified a priori between CTS2 Perpetration and CTS2 Victimization scales to account for the shared method (test-specific) variance associated with both components of the CTS2 but not shared with the RBRS-R when estimating the common general IPV factor.

The structural model. The results of the Study 1 MSEM can be summarized as follows:

1. Slower LH strategy contributed to enhanced executive functioning *and* enhanced mate value, respectively consistent with Salmon, Figueredo, and Woodburn (2009) and Gladden and colleagues (2010);
2. Slower life history strategy and enhanced executive functioning contributed to diminished short-term mating orientation, consistent with the view that long-term mating requires a *behavioral preference* for that lifestyle as well as sufficient *mental ability* to inhibit and control competing tendencies, such as short-term mating proclivities (see Figueredo & Jacobs, 2010);
3. Slower life history strategy and enhanced executive functioning contributed to diminished culture of honor revenge ideology, whereas short-term mating contributed to enhanced culture of honor revenge ideology;
4. Enhanced executive functioning contributed to diminished psychopathic and aggressive attitudes, consistent with the findings of Wenner and colleagues (2013) for generalized social deviance, whereas enhanced culture of honor revenge ideology, short-term mating orientation, and enhanced mate value contributed to in-

[3] As the equality constraints were set across unstandardized coefficients, some of the standardized parameters look slightly different but are not in terms of raw scores. This is attributable to minor differences in variances across female and male subsamples. Corresponding measurement and structural parameters for female and male subsamples, respectively, are given in parentheses, separated by a comma, and followed by an indication of statistical significance ($p < .05$).

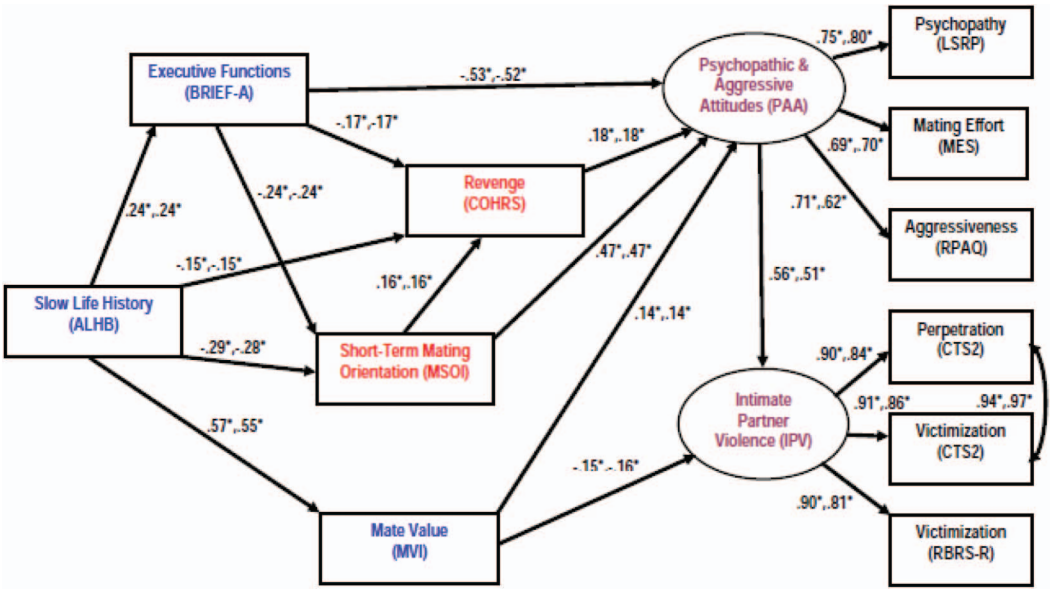

Figure 1. Multisample structural equation model for intimate partner violence estimated across male and female USA subsamples: "Cool" cognitive systems shown in blue (i.e., BRIEF-A, ALHB, MVI); "Hot" cognitive systems shown in red (i.e., COHRS, MSOI); Combinations of "cool" and "hot" cognitive systems shown in violet (i.e., PAA, IPV). Standardized ML parameter estimates: Female, Male. * $p < .05$. See the online article for the color version of this figure.

creased psychopathic and aggressive attitudes; and

5. Increased psychopathic and aggressive attitudes contributed to increased IPV perpetration and victimization, consistent with Wenner and colleagues (2013) for generalized social deviance, whereas enhanced mate value contributes to diminished IPV perpetration and victimization, consistent with previous evolutionary psychological research on IPV (e.g., Figueredo & McCloskey, 1993; Figueredo, Montero-Rojas, et al., 2009).

Thus, the various negative indirect effects of slow life history strategy on IPV were mediated through: (a) lower psychopathic and aggressive attitudes, themselves indirectly influenced by slow life history though enhanced executive functioning, lower short-term mating, and lower culture of honor revenge ideology; and (b) the enhanced mate value associated with slow life history individuals. The model explained 32% of the variance in IPV. Slow life history strategy was thus associated with diminished IPV through multiple causal pathways, all of which were indirect effects, and most of which were ultimately mediated through psychopathic and aggressive attitudes.

Study 2: IPA

Generalizability analyses. To quantitatively evaluate the cross-cultural validity of our constructs, we address the most important and potentially controversial measures in our model: (a) the slow life history (SLH) factor as measured by the ALHB, controversial for reasons already discussed above; and (b) the interpersonal aggression (IPA) factor as measured by the IRRS, potentially controversial as a novel and author-constructed set of scales. We performed a generalizability theory (GT) analysis on the convergent validity coefficients of all the subscales of both the ALHB and the IRRS. The goal was to test the generalizability of these psychometric parameters across cultures, to determine if the scales functioned the same way in these dif-

ferent study populations as indicators of the latent common factors that they were purported to measure.

These results of these models indicate the following: (a) The generalizability coefficients for subscale convergent validities across the five cross-cultural samples was about .9 for both the ALHB and the IRRS; (b) The generalizability coefficients for subscale convergent validities across the sexes of the targets, meaning same-sex versus opposite sex objects of aggression, was greater than .9 for the IRRS and in fact closely approaching unity. The latter finding is important to our hypothesis that interpersonal aggression is not specific to the aggressive behavior of one particular sex toward another, but is instead general to both. In addition, we took this opportunity to use GT to examine the aggregate internal consistency of items within subscales and found similarly acceptable GT coefficients, if not quite as high as the others as item reliabilities are never as good as their full subscale or scale reliabilities (see Figueredo, Cox, & Rhine, 1995).

The complete details of the analyses of variance, variance components analyses, and generalizability theory analyses for the convergent measures of SLH and IPA in Study 2 are displayed in Tables 6 and 7.

Cross-sample equality constraints. The MSEM with full cross-sample equality constraints imposed across the five cross-cultural constructive replications was not acceptable by strict statistical criterion, but it was acceptable by practical and parsimonious indicators of goodness-of-fit and by the *RMSEA* ($\chi^2_{308} = 623.90$, $p < .05$, *NFI* = .83, *CFI* = .90, *RMSEA* = .10). The MSEM with all of these cross-sample equality constraints across sex of respondent lifted was likewise not acceptable by strict statistical criterion, but was acceptable by practical and parsimonious indicators of goodness-of-fit and by the *RMSEA* ($\chi^2_{220} = 456.38$, $p < .05$, *NFI* = .87, *CFI* = .93, *RMSEA* = 0.10). The

Table 6
Analysis of Variance, Variance Components Analyses, and Generalizability Theory Coefficients for the Convergent Measures of SLH (Study 2)

TYPE1 analysis of variance: ALHB				
Source of variance	*DF*	η^2	*F*-ratio	Expected mean squares
Sample	4	.028	20.57*	σ^2(Error) + 25.4*σ^2(Sample × Subscale) + 150*σ^2(Sample)
Subscale	6	.371	184.30*	σ^2(Error) + 5*σ^2(Item (Subscale)) + 20.767*σ^2(Sample × Subscale) + 103.83*σ^2(Subscale)
Sample × Subscale	24	.051	6.30*	σ^2(Error) + 20.767*σ^2(Sample × Subscale)
Item (Subscale)	143	.359	7.48*	σ^2(Error) + 5*σ^2(Item (Subscale))
Error	572	.192		σ^2(Error)
Corrected total	749	1.000		

Variance components analysis: ALHB		
	TYPE 1 estimate	REML estimate
Variance component		
σ^2(Sample)	.000560	.000287
σ^2(Subscale)	.010610	.011460
σ^2(Sample × Subscale)	.001640	.001666
σ^2(Item (Subscale))	.008330	.008332
σ^2(Error)	.006424	.006420

Generalizability analysis: ALHB		
	TYPE 1 estimate	REML estimate
GT coefficients		
Subscale across Sample × Subscale	.866	.873
Subscale across Item (Subscale)	.560	.579

* $p < .05$.

Table 7
Analysis of Variance, Variance Components Analyses, and Generalizability Theory Coefficients for the Convergent Measures of IPA (Study 2)

Analysis of variance: IRRS				
Source of variance	*DF*	η^2	*F*-ratio	Expected mean squares
Sample	4	.076	27.01*	σ^2(Error) + 22.174*σ^2(Sample × Subscale) + 92*σ^2(Sample)
Target	1	.007	10.35*	σ^2(Error) + 55.435*σ^2(Target × Subscale) + 230*σ^2(Target)
Subscale	4	.475	168.71*	σ^2(Error) + 10*σ^2(Item (Subscale)) + 43.641*σ^2(Target × Subscale) + 17.457*σ^2(Sample × Subscale) + 87.283*σ^2(Subscale)
Sample × Subscale	16	.034	2.98*	σ^2(Error) + 17.457*σ^2(Sample × Subscale)
Target × Subscale	4	.009	3.36*	σ^2(Error) + 43.641*σ^2(Target × Subscale)
Item(Subscale)	41	.125	4.33*	σ^2(Error) + 10*σ^2(Item (Subscale))
Error	389	.274		σ^2(Error)
Corrected total	459	1.000		

Variance components analysis: IRRS		
	TYPE 1 estimate	REML estimate
Variance component		
σ^2(Sample)	.001563	.001541
σ^2(Target)	.000169	.000147
σ^2(Subscale)	.011220	.008187
σ^2(Sample × Subscale)	.000693	.000673
σ^2(Target × Subscale)	.000330	.000292
σ^2(Item (Subscale))	.002039	.002037
σ^2(Error)	.006118	.006106

Generalizability analysis: IRRS		
	TYPE 1 estimate	REML estimate
GT Coefficients		
Subscale across Sample × Subscale	.942	.924
Subscale across target × Subscale	.971	.966
Subscale across item (Subscale)	.846	.801

* $p < .05$.

difference between the two hierarchically nested models was rejectable by strict statistical criterion, but acceptable by the practical and parsimonious indicators of goodness-of-fit and by the *RMSEA* ($\chi^2_{88} = 167.52$, $p < .05$, *NFI* = .04, *CFI* = −.03, *RMSEA* = .00). Based on parsimony we retained the fully constrained model. Hence, we could not reject the hypothesis that all model parameters are statistically equivalent across the sexes of the respondents—meaning the statistics detected no parametric differences among the five cross-cultural constructive replications of any magnitude of practical importance. This means that our predictive model was consistent across all five cross-cultural replications.

Figure 2 displays the results of the fully constrained model. Asterisks (*) indicate all path coefficients (effect sizes; $p < .05$) significantly differing from zero. Standardized regression coefficients (λ-weights or β-weights) for the measurement and structural pathways are reported, as estimated by maximum likelihood (*ML*).

The measurement model. Analogously to the corresponding higher-order latent constructs in Study 1, the PAA factor and the IPA factors were higher-order latent variables constructed explicitly within the MSEM. These higher-order factors were of particular theoretical interest because they were hypothesized to be indicated by multiple heterogeneous measures, whereas the aggregation of subscales within each of battery of homogeneous measures described above was relatively uncontroversial. Nevertheless, both the PAA and IPA factors showed remarkably good convergence.

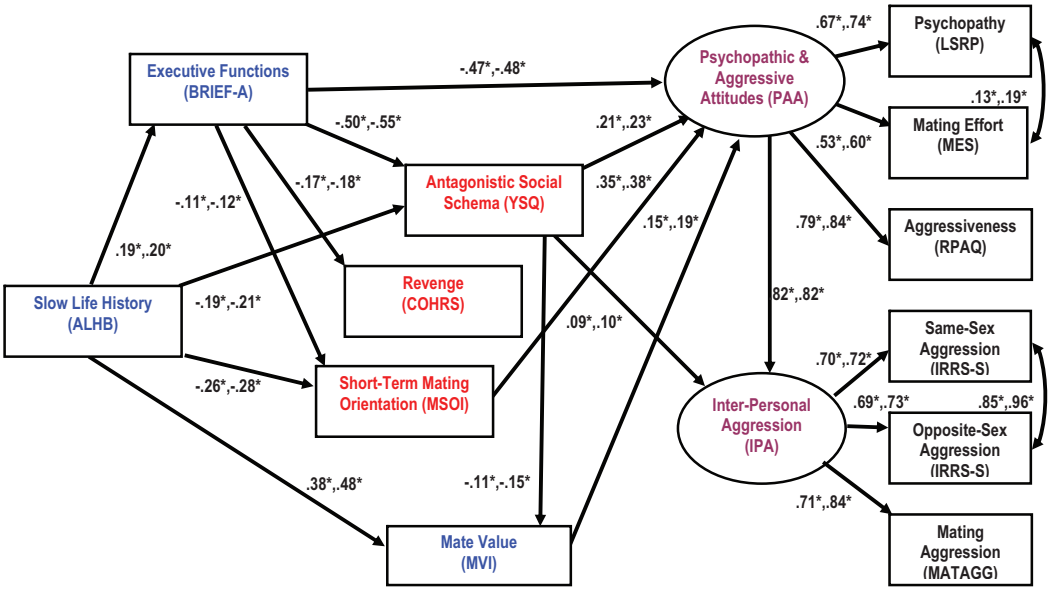

Figure 2. Multisample structural equation model for inter-personal aggression estimated across five cross-cultural constructive replications: "Cool" cognitive systems shown in blue (i.e., BRIEF-A, ALHB, MVI); "Hot" cognitive systems shown in red (i.e., YSQ, COHRS, MSOI); Combinations of "cool" and "hot" cognitive systems shown in violet (i.e., PAA, IPA). Standardized ML parameter estimates: Minimum, Maximum. * $p < .05$. See the online article for the color version of this figure.

Our explicit measurement model for the psychopathic and aggressive attitudes factor included the LSRP, the RPAQ, and the MES. A residual correlation was also specified a priori between LSRP and MES to account for the shared variance components among them (variance that was not shared with the RPAQ) when estimating the common general psychopathic and aggressive attitudes factor. Our explicit measurement model for the IPA factor includes the IRRS-S scale, the IRRS-O scale and the mating aggression scales. A residual correlation was also specified a priori between IRRS-S and IRRS-O scales to account for the shared method (test-specific) variance associated with both components of the IRRS but not shared with the mating aggression scales when estimating the common general IPA factor.

The structural model. The results of the Study 2 MSEM can be summarized as follows:

1. Slower life history strategy contributes to enhanced executive functioning and mate value, once again consistent with the findings Gladden and colleagues (2010) for mate value and of Salmon and colleagues (2009) for executive functioning;
2. Slower life history strategy and enhanced executive functioning contribute to diminished antagonistic social schemata, consistent with the predictions of Figueredo and Jacobs (2010);
3. Enhanced executive functioning contributes to diminished culture of honor revenge ideology;
4. Slower life history strategy and enhanced executive functioning contribute to diminished short-term mating orientation, once again consistent with the view of Figueredo and Jacobs (2010) that long-term mating requires a *behavioral preference* for that lifestyle and sufficient *mental ability* to inhibit and control competing tendencies, such as short-term mating proclivities;
5. Enhanced executive functioning contributes to diminished psychopathic and aggressive attitudes, consistent with the findings of Wenner and colleagues (2013),

whereas increased antagonistic social schemata, increased short-term mating orientation, and enhanced mate value contribute to increased psychopathic and aggressive attitudes; and

6. Increased psychopathic and aggressive attitudes and increased antagonistic social schemata both contribute to enhanced IPA, once again consistent with the findings of Wenner and colleagues (2013) for generalized social deviance.

Thus, the various negative indirect effects of slow life history strategy on IPA were mediated through: (a) lower psychopathic and aggressive attitudes, themselves indirectly influenced by slow life history though enhanced executive functioning, diminished short-term mating, and diminished ASS; and (b) the enhanced mate value associated with slow life history individuals. Table 8 displays a cross-cultural breakdown of the proportions of variance accounted for by these models on both major outcome constructs: about 60% of the variance in psychopathic and aggressive attitudes, and about 75% of the variance in IPA across all five constructive replications. Slow life history strategy is associated with diminished IPA through multiple causal pathways, all of which are indirect; most pathways were ultimately mediated through psychopathic and aggressive attitudes and antagonistic social schema.

Discussion

The results of this series of hierarchically nested model comparisons are consistent with the theory-driven hypothesis that slow LH strategists tend to evolve and develop mediating psychological mechanisms that inhibit violence against potential same-sex sexual partners and opposite sex sexual rivals. More broadly speaking, the ways in which slow LH strategists suppress the expression of IPV and IPA and the ways they inhibit behavioral expressions of sexual coercion, intrasexual competition, intersexual competition, negative androcentrism, negative ethnocentrism, and socially deviant behaviors in general are the same (see Figueredo & Jacobs, 2010). The present results are consistent with the prediction that slow life history strategies are functionally incompatible with antagonistic social schema, which include hostility, distrust, and suspicion toward others, because they tend to interfere with: (a) long-term mating strategies; (b) long-term parental investment; (c) long-term nepotistic relationships; (d) long-term reciprocal altruism; and (e) long-term social cohesion. Antagonistic social cognitions are, however, compatible with and serve to promote IPV and IPA.

Importantly, the relations among life history strategy, IPV, and IPA are indirect and mediated by a dynamic interplay among cool and hot cognitive systems. The outputs of these cognitive systems represent a more proximate level of causation than life history strategy, with hot systems serving primarily to excite and cool systems serving primarily to inhibit IPV and IPA. Our models are consistent with inhibitory effects of executive functioning, a cool cognitive process, and excitatory effects of hot cognitive processes, including mate value, short-term mating orientation, and antagonistic social schema, in predicting psychopathic and aggressive attitudes.

These results caution against the twin perils of reductionism and fatalism. They caution against reductionism by demonstrating that natural and sexual selection can act indirectly by shaping distal tendencies such as life history strategies, rather than directly shaping specific behavioral tactics. Life history strategies, in turn, influence the developmental implementation and situational engagement of various hot and cool psychological systems. A variety of sociocultural and ecological situations moderate these evolved psychological mechanisms (Figueredo, Sefcek, & Olderbak, 2009) and their behavioral expression—or lack thereof—of IPV and IPA.

Table 8
Squared Multiple Correlations of Outcome Constructs for All Five Cross-Cultural Constructive Replications (Study 2)

	R^2	
Cross-cultural replication	PAA	IPA
Australia	.57	.76
Italy	.58	.76
Mexico	.58	.76
Singapore	.59	.77
United States of America	.57	.76

These results caution against fatalism by implicitly tracing the etiology of IPA and IPV to evolution and development within harsh (enhanced risk of extrinsic morbidity and mortality), unpredictable, and uncontrollable environments, the ultimate selective pressures underlying fast life history strategies (Ellis et al., 2009). Despite the fact that life history strategy is highly heritable ($h^2 = .65$; Figueredo, Vásquez, Brumbach, & Schneider, 2004), and perhaps less plastic in adulthood than in early development (e.g., Belsky, Steinberg, & Draper, 1991), many of the proximate psychological mediators identified, such as impaired executive functioning, are amenable to preventive and protective interventions (e.g., Insel, Morrow, Brewer, & Figueredo, 2006). Thus, these results provide hope for intervention at the longer-term ecological level.

Although a fatalistic view predicts slower life history strategists suppress hot cognitions, thereby inhibiting socially deviant behaviors, this does not imply that faster life history strategists cannot do the same; it only implies they are less likely to do so. IPV and IPA are tactics, deployed in the service of an overall adaptive strategy that may be more consistent with faster than slower life history strategies. Faster life history strategists may simply be more inclined to permit the behavioral expression of such aggressive tendencies, contingent upon environmental triggers. The expression or nonexpression of these behaviors are not completely determined by one's life history strategy; expression depends on many other environmental circumstances and situational cues.

Fast life history strategies are not logically equivalent to socially deviant behaviors. Because life history theory requires that an overall strategy consists of a coordinated set of mutually consistent and reinforcing behavioral tactics, selection eliminates individual tactics that interferes with others in the suite. Slower life history strategies are generally inconsistent with socially deviant behaviors *within Western cultures*. For example, if a middle-aged, currently married, parental investing slow life history strategist who is employed in a high-status profession decided to rob a liquor store or commit rape, the consequences for his family, life, and career would be devastating. In contrast, if an inner city juvenile delinquent, with dismal job prospects, and no significant romantic, familial, or community attachments fast life history strategist did the same, the consequences for him would be substantially less catastrophic. Rape, for example, may be an adaptive tactic if an individual is interested in short-term, uncommitted, promiscuous sex; it is a maladaptive tactic if an individual is interested in a committed, long-term, mutually caring and loving relationship with a long-term partner.

An individual who is interested in short-term, uncommitted, promiscuous sex does not *have to* rape or rob. Faster life history strategists simply appear more inclined to permit these behavioral expressions, perhaps contingent upon environmental triggers. In behavioral endocrinology, this is known as "permissive" rather than an effect of true compulsion. Exactly what turns an otherwise peaceful and law-abiding fast life history strategist into a social deviant is currently a puzzle.

Although there are constructive and scientifically productive conflicts among standard social science and evolutionary psychological theories with respect to particulars of how to put this whole explanatory package together, the prospect of a holistic integration is a goal within reach. Just as many standard social science theories, such as those flagging the centrality of coercive control in IPV and IPA, anticipated predictions derived from evolutionary psychological theories, many evolutionary psychological theories examining the ultimate adaptive functions of IPV and IPA clarify what appear to be the most relevant selective pressures shaping the behavior during human evolutionary history. Most standard social science theories address immediate (proximate) causes of IPV and IPA during individual development, some of which plausibly serve to implement and achieve the ultimate adaptive functions evolutionary theories hypothesize. The present results are consistent with this consilient point of view in that they model previously identified psychological mechanisms as mediators of the relations among life history, IPV, and IPA. This illustrates how, as Crawford and Anderson (1989) previously noted, evolutionary explanations can be consistent with those emphasizing environmental determinants that proximately evoke and shape evolved adaptive behaviors.

A striking result in this model is the negative impact of executive functions on psychopathic and aggressive attitudes. Some might ask,

"Does this model represent nothing more than a repackaged version of the general theory of crime" (Gottfredson & Hirschi, 1990)? We suggest that it does not, for several reasons.

First, a life history theory formulation differs from the general theory of crime in that self-control theory claims the failure to control criminal impulses occurs the moment an opportunity arises. A life history formulation claims the inhibitory effects of enhanced executive functioning operates indirectly through a causally prior latent construct—psychopathic and aggressive attitudes—with no direct effect of enhanced executive functioning on interpersonal aggression. This view places control of aggressive impulses occurs further back in the hypothesized causal sequence: it suppresses covert cognitions and overt behaviors that might be socially deviant.

Second, life history theory features enhanced mate value, diminished short-term mating, and diminished antagonistic social schema as individual difference variables that are excitatory, rather than just inhibitory, with respect to psychopathic and aggressive attitudes. In contrast, the general theory of crime relies almost exclusively on a lack of impulse control in the face of temptation as the primary factor in criminal behavior; it does not sufficiently address individual differences in the nature and the strength of criminal impulses themselves.

Third, life history theory identifies slow life history as the ultimate common causal influence behind enhanced executive functioning, enhanced mate value, diminished short-term mating, and diminished antagonistic and social schema that collectively inhibit psychopathic and aggressive attitudes, and indirectly IPA. As with the effects of life history strategy in general (Figueredo, Vásquez, Brumbach, & Schneider, 2007), these small to moderate effects are cumulative and summate. Life history strategy exerts a pervasive influence on many of our cognitions and behaviors, many of which either facilitate or inhibit criminal behavior. To our knowledge, no other theory adequately or comprehensively accounts for the suite of behavioral adaptations required to pursue mutualistic or antagonistic social strategies.

Fourth, life history theory differs from the general theory of crime in that executive functions and impulse control are not isomorphic. Executive functions encompass inhibitory functions and also include goal setting, planning, sequencing, prioritizing, organizing, initiating, pacing, shifting, monitoring, controlling, and completing actions. Similarly, although executive functions and general mental abilities (IQ) are somewhat correlated and contribute jointly to suppressing socially deviant behaviors, they too are not isomorphic (Friedman et al., 2006; Wenner et al., 2013). Hence, a life history formulation is not a repackaged version of a the general theory of crime or IQ theory of criminal/deviant behavior.

The general theory of crime is currently superior to the present formulation in that the former encompasses crimes against persons *and* crimes against property (we did not include property crime in our outcome measures). How well life history theory formulation accounts for property crime remains to be tested. Clearly, white-collar crime, which encompasses both, is consistent with this evolutionary model.

Some will find certain findings we described controversial. Disputation regarding what hypotheses ought or ought not motivate empirical studies damages scientific progress; it disallows disconfirmation (Popper, 1959), strong inference (Platt, 1964) and leads to degenerative rather than progressive research programs (Lakatos, 1978).

We imposed cross-sample equality constraints on all model parameters: (a) across sexes in Study 1, predicting IPV; and (b) across the five cross-cultural constructive replications in Study 2, predicting IPA. In both cases, these cross-sample equality constraints were acceptable by practical and parsimonious indicators of goodness-of-fit used to evaluate these models. Hence, we could not reject the hypothesis that all model parameters were statistically equivalent across the respondents' sexes and cultures of origin. The statistics detected no parametric magnitude-of-practical-importance differences in the modeled etiology of IPV or IPA across specified categories of respondent. Consequently, the data support a lack of sex differences in the etiology of these aggressive behaviors, and a lack of domain specificity in the basic etiology of IPV and IPA.

Limitations

There are several limitations to these results. The first is that the fit of these structural models,

although minimally adequate, were only barely so. The statistical method that we used, multisample (or multigroup) structural equations modeling (MSEM) was designed to test for the statistical equivalence of the model specifications (*configural equivalence*) and of the values of model parameter estimates (*metric equivalence*) across independent samples randomly drawn from the same population. Thus, the statistical assumptions underlying the tests of the cross-sample equality constraints were designed for *literal* replications. By those standards, the fit of our equality-constrained models were indeed only barely adequate.

Nevertheless, our stated goal was to test the cross-cultural consistency of the performance of our theoretically specified models across widely different human populations, spanning several different continents. We were never expecting them to be absolutely equal in their model parameters at the level of precision that one would expect of literal replications. We instead claim sufficient empirical support for the conclusion that the same basic structural model appears to fit reasonably well across all five cross-cultural replications, with the obvious qualification that there is no way that these five discrepant cultures are going to produce statistically identical model parameters. Consistent with this reasoning, we do not claim extremely close fit for these models to the cross-cultural data. We instead advance the much more limited claim that the same pattern of causal influences appears to generalize across five widely different cultural groups.

The second major limitation is that the data are based on self-report measures, hence we cannot rule out differences between self-report and performance. Given the current topic, however, behavioral observations are impractical and unethical. The anonymity of self-report surveys may be advantageous; participants accurately report instances of IPV under these circumstances.

The third major limitation is that U.S.A. samples and cross-cultural constructive replications consisted primarily of young adults from university settings. These circumstances bring up two generalizability problems: The participants are young college students. Henrich, Heine, and Norenzayan (2010) criticized psychology for using Western, educated, industrialized, rich, democratic (WEIRD) samples exclusively because such samples may not adequately represent characteristics of the human population as a whole. That caution is, in principle, advisable. As many human characteristics vary among groups, individuals, and ages, whereas others are species-typical, the relative representativeness of such samples depends on the participant characteristics being examined.

As responding to this criticism by establishing the generalizability of every construct in a model is impractical, we limit ourselves to presenting results relevant to the first and last of our latent constructs. With respect to the first exogenous predictor variable in the structural model, slow life history, Figueredo and colleagues (2014) performed systematic statistical comparisons of the estimated standard deviation in a relatively large English-speaking North American college-student sample to a comparable nationally representative sample of adults to determine if there is a restriction of range in the college student and the adult sample. The difference in standard deviations was (a) not statistically significant and (b) in the opposite direction predicted by a restriction of range hypothesis (*Folded* $F_{646,341} = 1.10, p = .1516$).

More recently, Figueredo and colleagues (2017) introduced a new short form of the ALHB, to supplement the Mini-K (and in some cases replace it), using a subset of the present data. In that paper, they used novel heuristic methods to sample the most cross-culturally valid items in the full ALHB for the construction of the new short form, called the K-SF-42, and performed detailed psychometric analyses on the measure, including IRT Rasch models of item and subscale functioning. Item and subscale "difficulty" (δ) parameters were assessed relative to the θ construct of aggregate "K-Factor" score, meaning how slow a life history speed an individual requires to endorse the given items or subscales. They then performed GT analyses on the item and subscale difficulties estimated by the IRT, and found that the generalizability coefficient of subscale scores across the five cross-cultural replications was .94, indicating that the cross-cultural validity of our subscale functioning as assessed by IRT Rasch analysis yielded similar results to those of the convergent validity coefficients in the present study in terms of the rank order of their "difficulty" estimates.

With respect to the last endogenous criterion variable in the structural model, Figueredo et al. (2017) used the same novel heuristic methods as were used to develop the K-SF-42 to sample the most cross-culturally valid items in the full IRRS, also using a subset of the present data, for the construction of a corresponding short form: the IRRS-SF-30. As with the previous paper, they then performed detailed psychometric analyses, including IRT Rasch models of subscale functioning. Subscale "difficulty" (δ) was assessed relative to the θ construct of aggregate "IPA Factor" score, meaning how much aggregated interpersonal aggressiveness an individual requires to endorse the given items or subscales. They then performed GT analyses on the IRRS-SF-30 subscale difficulties estimated by the IRT, and found that the generalizability coefficient of subscale scores across the five cross-cultural replications was .96 and across same-sex versus opposite sex objects of aggression was .92, once again indicating that these IRT Rasch analysis yielded similar results to those of the convergent validity coefficients reported in the present study.

Most relevant to the present study, they then performed GT analyses on the original IRRS long form subscale difficulties estimated by the IRT, and found that the generalizability coefficient of original IRRS long form subscale scores across the five cross-cultural replications was .88 and across same-sex versus opposite sex objects of aggression was .95, yet again indicating that these IRT Rasch analysis yielded similar results to those of the convergent validity coefficients reported in the present study. Recall that these GT coefficients apply to the original IRRS long form, which is the one used in the present study. The GT Coefficients for the long form were not quite as good as those obtained for the short form, although they were still very high, but one must also consider that the long form did not yet have the items selected to maximize cross-cultural validity.

At first glance, it might also seem that the sampled population is not ideal for a study on IPV or IPA. There is a wealth of published data, however, that suggest otherwise. Young humans are not at diminished risk IPV or IPA. Although younger women enjoy an enhanced reproductive value and potential, they are prime strategic targets for sexual coercion and sexually motivated aggression (e.g., Figueredo & McCloskey, 1993; Gladden et al., 2008). Similarly, younger unattached males, who are now and have been throughout our evolutionary history in intense reproductive competition, are at greater risk for becoming both perpetrators and victims of interpersonal aggression than older males ("the young male syndrome"; Wilson & Daly, 1985). The 2015 *Report on the AAU Campus Climate Survey on Sexual Assault and Sexual Misconduct* (Cantor et al., 2015) attests that: (a) nearly 30% of male and female college students witnessed sexual assault and 20% reported sexual assault is "very problematic" on their campus; (b) almost 12% of 150,000 students who attended one of 27 U.S.A. universities reported being coerced into having some form of nonconsensual sex; and (c) just over 23% of the females in this group reported nonconsensual sex, 10% of whom reported forced penetration. Thus, it is unlikely that the youth of the present sample diminished their risk for IPV or IPA.

With respect to education levels, sexually coercive and sexually violent behaviors occur at high frequency among college students (e.g., Sisco & Figueredo, 2008). Thus, the relative educational level of the present sample is unlikely to diminish risk for either IPV or IPA substantially.

Taken together, our sample characteristics may be strengths in terms of sampling an adequate frequency of IPV. This does not imply that student samples represent the general population in every way; rather it implies that the levels of the criterion variable are comparable on the two most important dimensions for the sampling frame. As stated more eloquently by Cabeza de Baca and colleagues (2014), in relation to the qualified predictive validity of this practice when interpreted correctly:

Students cannot be used incautiously as surrogates for general populations. Nevertheless, recent analyses by Flere and Lavrič (2008), based on the World Values Survey data on mean values of four sociologically and psychologically relevant measures comparing between national and student samples of 23 countries, showed that comparisons of student samples are reliable predictors of general cross-cultural differences. This is because we can to some extent infer the cross-cultural differences in the general populations from those observed in student samples, given the known systematic differ-

ences between student and nonstudent samples that are fairly generalizable across cultures that have student populations (Henrich, Heine, & Norenzayan, 2010, p. 550).

Conclusion

Most of the theories we reviewed, whether standard social science or evolutionary social science, differ in detail and in conflation of proximate and ultimate levels of causation. To counteract this, we propose a cross-disciplinary integration, based on life history theory, as an inclusive and integrative framework and as a framework to descriptively grasp many of the previous findings within an evolutionary context.

It appears that life history theory is the most integrative and inclusive framework for synthesizing the present findings and the corpus of empirical and theoretical work reviewed above. Life history evolution underlies most of the evolutionary hypotheses originally proposed as alternatives. For example, the links between IPV, IPA, and life history helps account for relations among the: (a) genetic heritability of IPV and IPA; (b) link between IPV, IPA, and insecure attachment styles; and (c) link of IPV and IPA to extended family structure, as both family social support and kin altruism are indicators of slow life history (e.g., Figueredo et al., 2007).

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