



Lynn's *r/k selection* theory of criminality revisited: Consideration of individual differences and developmental life history contributions to the patterning of population differences in antagonistic social strategies

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ABSTRACT

We revisit an old theory proposed by Lynn, connecting race differences in criminality and psychopathy with *r/k selection*. The origin of this group-difference is attributed to cold-selection in the Pleistocene. We contend that newer models of Life History Theory provide a better rubric within which to evaluate Lynn's arguments as a) they better account for the adaptive logic of the coherence pattern among the traits characteristic of so-called 'psychopathic personality', b) provide a normatively free language with which group differences in behavior can be described, and c) make predictions at the level of both the individual and intra-individual (developmental) levels, which permit the role of environmental contributions to these dispositions to be better comprehended. Thus newer approaches to understanding life history are necessarily more empirically nuanced. We also consider the merits of future, more systematic studies along the lines of Lynn's contribution.

1. Introduction

Behaviors deemed *deviant* or disruptive to prevailing social norms or citizen well-being are regarded as unlawful acts and promptly punished through judicial proceedings. These unlawful acts result in considerable costs to victims and to the community across multiple domains like loss of time, money, and security. The propensity towards violent crime is not equally distributed between ethnic and racial groups. One controversial explanation for racial-ethnic discrepancies in crime has been to propose that differences exist in the levels of *psychopathic personality* traits between racial/ethnic groups that may account for differences in both within and between country crime rates (e.g., Lynn, 2002). This manuscript wholly acknowledges that significant variation may not correspond to the level of classical races or continental populations but may reside at a lower level of taxonomic aggregation (i.e., at the level of subpopulations) and that future research dealing with the issue of group differences should strive to analyze the patterns at this higher-taxonomic resolution. Analyzing the non-random variation among populations with respect to criminogenic and other behavioral phenotypes represents a significant challenge for future research in population genetics (Reich, 2018).

Lynn's (2002) central thesis that psychopathic traits are unevenly distributed across racial-ethnic lines may be simplifying complex evolutionary, developmental, and ecological processes. Meta-analytic research indeed shows that a relationship between race and psychopathy rates exists across adults with history of substance abuse, in corrections, or a psychiatric sample (Cohen's $d = .11$; Skeem, Edens, Camp, & Colwell, 2004) and in adolescents residing in detention homes (Cohen's weighted $d = 0.20$; McCoy & Edens, 2006), but there is a considerable degree of heterogeneity across studies – denoting that systemic, contextual, and ecological factors may be important sources to consider when examining race/ethnicity and crime. Thus, our commentary provides an evolutionary ecological interpretation and highlights important conceptual and methodological points to consider. We argue that racial/ethnic differences in individual difference traits may be explained by ecological forces.

2. Historical consideration

Historically, structural and institutional barriers have existed, which have served to reduce the access of certain racial/ethnic groups such as Blacks, Hispanic/Latinos and Native Americans to so-called

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“normative” developmental experiences. These barriers manifest both in the context of the historical experiences of these groups as minorities in Western countries, and in the context of their broader experiences of factors such as colonialism in countries where they are the principal ethnicities (see Cabeza de Baca, Figueredo, & Garcia, 2016, for similar discussion). Macro-social and ecological characteristics such as lack of access to resources (e.g., poverty, neighborhood mobility), enslavement and/or family disruption (Sampson & Wilson, 1995), and targeting of ethnic minority groups (e.g., greater police stops and searches among select racial-ethnic minority groups; Pierson et al., 2017) likely put tremendous stress on whole groups of individuals, however, not everyone who experiences these conditions become criminals. Neither is it the case that all minority groups aggregately respond in the same way to the presence of historical structural inequalities. Despite having been subject to discrimination at various points in their histories, East Asians and Ashkenazi Jews in the US for example, contemporaneously earn more per capita than the White majority (Pew Research Center, 2013; Census Bureau, 2012). Evidence at the individual level exists to suggest that cultural cohesion and strong ethnic identity may buffer against such discrimination. Among other racial-ethnic minorities such as Latinos and Blacks, greater ethnic identity and/or cultural socialization buffered against reported discrimination and prejudice (Brown & Tylka, 2011; Romero, Edwards, Fryberg, & Orduña, 2014).

Clearly therefore, the *social privilege* that is purportedly denied these groups from the presence, both historically and contemporaneously, of these structural inequalities cannot account for the entirety of the pattern of ethnic and racial differences in indicators of disadvantage (i.e. poverty and crime). Furthermore, within groups, we should expect to see between-person variation regarding the sensitivity of individuals to the social forces and other environmental influences deemed either ‘positive’ or ‘negative’, based on conventional “normative” definitions of what constitutes optimal developmental experience (Belsky & Pluess, 2009), which means that a strictly group-based assessment of the determinants of normatively problematic behavior necessarily lacks nuance.

We will here review evolutionary and ecological models of development that considerably enhance Lynn's (2002) evolutionary reasoning on the origin of the group differences, which is based on a now-outdated evolutionary model, mainly *r/k Selection Theory*, which downplays both individual and intra-individual (developmental) differences central to modern life history models (e.g., Ellis, Figueredo, Brumbach, & Schlomer, 2009). On this basis we will call into question the normative assumptions latent in the application of criminological language (e.g., promiscuous (p. 309), irresponsible (p. 303), delinquent (p. 209), psychopathic (p.274); Lynn, 2002) to what are in reality simply *antagonistic* evolutionary strategies. We will proceed to argue that Life History Theory in particular provides a more objectively neutral language for the description of both group and individual-level evolutionary strategies.

Prior to and subsequent to Lynn (2002), several scholars have articulated the need for integration between evolutionary models and criminology to better explain and predict criminal behavior (e.g., Boutwell et al., 2015; Ellis, 1988, 2005). Ellis (1988, 2005) has stated the biological and physiological explanations of behavior have steadily progressed across different areas within the social sciences; despite this steady growth of biological bases of behavior, criminal justice lags behind. He laments that criminologists may not have the biological training to integrate criminal justice research. Similarly, Boutwell et al. (2015) have discussed the need for an underlying unifying theory of crime that integrates disparate findings under a cohesive evolutionary framework, including macro- and individual-level description and prediction of behavior. Boutwell uses Rushton's *Differential-K Theory* and developmental taxonomy classifications by Moffitt (1993) to put forth the hypothesis that taxonomic criminal offenders (e.g., Life-Course Persistent, Adolescent-Limited, and Abstainers) fall along a slow-fast life history continuum (see below). We seek to extend these

evolutionary frameworks of criminology by showcasing the importance of ecological forces in shaping individual development and behavior.

3. Life history as a meta-theory to account for population differences in so called “anti-social” behavior

Lynn describes group-differences in psychopathic personality as evolved adaptations to the rigors of the local climate. His argument relies heavily on the assumption of Pleistocene cold-selection, operating piecemeal on various components of psychopathic personality. Broadly, cold winter theories purport that group differences in behavior and personality emerge as a result of ancestral exposure to different climatic forces. Groups exposed to cold, harsh weather are posited to need executive control (e.g., planning, insight, and control) and cooperative social strategies to navigate the environment. Conversely, groups exposed to warmer weather would not need to cultivate greater executive control and cooperative social strategies, as greater abundance of food and resources were readily available and easier to extract. The concepts of delay of gratification, intelligence, relationship stability/fidelity, and moral orientation are discussed as possible heritable substrates on which historical diversifying selection may have operated. A critique of these cold winter theories was put forth, suggesting that the link between climate and behavioral/personality factors did not account for sociocultural and economic forces that arise from biotic and abiotic conditions pertinent to the immediate environment (Cabeza de Baca & Figueredo, 2014; See also Lange, Rinderu, & Bushman, 2017 and León & León, 2014; León & Burga-León, 2015 for other proposed pathways between climate and behavior and cognitive abilities). Accordingly, the impression cold winter theories give is that the selection is piecemeal, operating on each trait individually either in series or in parallel. A major advancement in understanding the adaptive logic of these selection pressures and their resultant phenotypes is not discussed by Lynn however, chiefly Life History Theory.

A key feature of life is variability. This is the raw material on which Darwinian selection operates in the generation of novel organic forms, or evolution. Variation is, however, ultimately constrained by physical and chemical factors, chief among which are the laws of thermodynamics. This means that organisms cannot have infinite budgets of energy with which they can simply live forever. Instead, living things like all complex physical systems succumb to entropy (loss of information). Thus, in order to overcome this limitation, organisms must maximize the reproduction of propagules, variation among which ensures that at least some gene lineages can continue propagation irrespective of environmental variability. Organisms are not, however, fixed in terms of longevity or reproductive output. Indeed, there exists inverse associations between these sources of variation across taxa, suggesting that different ratios of these may benefit different species adapting to different niches. This variability is studied under the rubric of Life History Theory (Stearns, 1992), this being a mid-level evolutionary theory that describes the adaptive logic of patterns of resource allocation toward different domains of development such as somatic and reproductive effort (Ellis et al., 2009). Investment into these different domains is contingent on a combination of inputs received by the organism from the environment during development (ontogeny), such as the organism's experience of mortality salience stemming from environmental harshness and unpredictability (i.e. characterized by the presence of both random and high absolute mortality), and the organisms evolutionary history, i.e. the degree to which persistent exposure to a particular set of environmental contingencies will have optimized via genetic selection the genome of the lineage in order to maximize gene-copying success (Ellis et al., 2009). Life History strategies cohere into a continuum, characterized at one pole by high effort allocation into mating, coupled with correspondingly low effort allocation into parenting effort, somatic effort (i.e. organismal maintenance) and communitarian effort (i.e. the developmental of prosocial and cooperative behavioral phenotypes). This *Fast* strategy is characterized by

rapid maturation, low population density (evidencing lower cooperativeness) and a high yield of minimally invested into offspring, which exhibit higher mortality. The corresponding *Slow* strategy is characterized by low investment into mating, coupled with high investment into community-building and biological maintenance. *Slow* strategists furthermore mature more slowly, and remain developmentally plastic for longer (Ellis et al., 2009), they are also capable of ecological specialization to a greater degree, which is a manifestation of greater cooperativeness (Figueredo, Woodley, Brown, & Ross, 2013). This basic continuum exists at multiple levels of taxonomic aggregation, from species differences (MacArthur & Wilson, 1967; Pianka, 1970) to within-species differences, which within *Homo sapiens* encompass both the levels of race and population differences (Rushton, 2000) and individual differences (Figueredo, Vásquez, Brumbach, & Schneider, 2004).

With respect to humans, two distinct Life History models have been proposed. Developmental Life History models (e.g., Belsky, Steinberg, & Draper, 1991; Chisholm, 1993), which emphasize the ontogenetic component of Life History (i.e. the intra-individual variability in Life History), highlight the importance of family functioning and child attachment on the development of life-long social strategies. The household acts as a conduit to the outside world and provides the norms necessary to navigate the social milieu. Households characterized by low positive family expressiveness and poor co-parenting are often reported by individuals exhibiting social strategies that are less prosocial (Sotomayor-Peterson, Cabeza De Baca, Figueredo, & Smith-Castro, 2013). Consistent with the importance of developmental inputs to life-long Life History strategies are the existence of specialized adaptations which exist to calibrate Life History strategy during childhood based on stress reactivity (Ellis, Jackson, & Boyce, 2006; Meaney, 2010) and stochastic environmental sampling of mortality salient cues (Nettle, Frankenhuys, & Rickard, 2013).

Individual differences models of Life History emphasize the fact that between-person variability in behaviors, self-perceptions, personality traits and social cognitions cohere into a Life History continuum, termed the *Super-K factor* (Figueredo et al., 2004). This *Super-K* factor incorporates into its broader nomological network traits that appear on the DSM's rubric for psychopathological personality (Figueredo, Cabeza de Baca, & Woodley, 2013), which are more pronounced amongst those with fast strategies. Conversely, behavioral manifestations of slow life history are characterized by prosocial and agreeable personality traits in both the developmental (Belsky et al., 1991) and individual differences models (Figueredo, Woodley, et al., 2013). Individual differences models also subsume group-difference models of life history, such as *Differential K*, which argues for a similar continuum of behavioral and cognitive traits at the level of racial, ethnic and also socio-economic group differences (Rushton, 1985, 2000; see: Figueredo, Vásquez, Brumbach, & Schneider, 2007 for an empirical demonstration of the relative contributions of individual and group-level variation in life history strategy, as measured using the *K*-factor and related scales). Notably, these models (as the life history developmental models) emphasize that *more* variability exists within racial/ethnic groups than between racial/ethnic groups, emphasizing the importance of environmental calibration of life history strategies and the role played by balancing polymorphism selection in response to spatial and temporal environmental heterogeneity with respect to dimensions of environmental risk to maintaining individual differences in life history speed (Ellis et al., 2009).

Most recently, an examination of temperature and personality was tested in a large group of Chinese and United States participants (Wei et al., 2017). Contrary to cold winters theory, which posits a linear relationship between temperature and behavioral and personality traits (i.e., colder temperatures in areas away from the equator will be associated with behavior reflective of a more cooperative social strategy), the authors hypothesized a U-shaped association between temperature and personality (i.e., areas with mild temperatures (~72° Fahrenheit)

would include individuals with more cooperative personality traits, as compared to areas with extreme cold or heat). Another distinction from cold winters theory is their theorizing. As mentioned, cold winters theories broadly purport that group differences emerge as result of ancestral environmental adaptations; in contrast, Wei et al. (2017) attribute the emergence of regional differences to proximate forces. They argue that environments with mild weather, in comparison to colder or hotter environments, will promote increased socialization among conspecifics via more exploration and sensation-seeking and greater encounters with others residing in the environment. This does not preclude the possibility that this is an indeed an evoked adaptive response and that there are race and population differences in the degree of preparedness with respect to temperamental flexibility, but it is clear, nevertheless, that the distal antecedents with such an evolved response are likely to have a more nuance association with the relevant environments of adaptive history than that posited by Lynn (2002). As hypothesized, mild weather was significantly correlated with prosocial personality traits (openness, conscientiousness, extraversion, agreeableness, and emotional stability) and personality composites of Alpha and Beta, when accounting for relevant sociodemographic and cultural confounds.

A major strength of their work was that they focused on within-country climatic variation and personality differences (taking account possible racial confounds present in between-country climate research) and used individual-level data (as opposed to state or population level data that is most often used). The authors additionally included only participants (in the Chinese sample) in which their “birthplace matched their ancestral home (Wei et al., 2017, p. 891),” to avoid any confounding active gene-environment correlation. As such, the hypothesis that individual variation in personality and other differential traits is influenced by the environment and contextual factors appears to be supported in this set of analyses.

4. Whether psychopathy is ‘bad’ is adaptively relative

A key problem with some of the terminology utilized by researchers not informed by theories of evolution is that it implies a value judgement, and thus, an apparent preference against specific suites of traits that connote psychopathology (such as ‘deviate’, ‘delinquents’ and ‘criminals’). The opposing manifestations of these traits and tendencies (such as ‘altruism’) are by contrast considered virtuous by Western normative standards (e.g. Henrich, Heine, & Norenzayan, 2010).

The term *psychopathic personality* denotes a cluster of individual characteristics that, as Lynn notes, correspond to “general poverty of affect” (Lynn, 2002, p. 274). Whilst it is clear that Lynn does not make such a facts-value conflation, researchers utilizing evolutionary reasoning should nonetheless avoid the temptation to conflate terms such as *psychopathology* (which connotes normative suboptimality via the term *pathology*) with contextually less optimal adaptation. Ecological and evolutionary context matters in deciding what constitutes adaptive vs. non-adaptive behavior. Ellis et al. (2012) have discussed the important role context plays in understanding the functional role of risky adolescent behavior. Environmental conditions typically experienced by the sorts of racial and ethnic groups endemic to so-called developing countries for example, are what would be generally considered, harsh and unpredictable by Life History theorists. As such, the apparently ‘anti-social’ behaviors exhibited by groups of individuals residing in these environments may confer survival and reproductive benefits (Ellis et al., 2009), which integrated across a large enough number of generations will have come to characterize a group-level adaptation (Rushton, 2000). As such, it is reasonable to expect that there should be intra-specific variation in across many behavioral traits like aggression among human populations given that there exists inter-specific variation in aggression at higher-levels of taxonomic aggregation (e.g., between species; see Rushton and Templer (2012) for a brief review of aggression across species and its implications on human aggression).

This position appears to be empirically grounded, for example, in the case of adolescents who bullied their peers and college students who retrospectively reported bullying reported higher number of sexual partners (Volk, Dane, Marini, & Vaillancourt, 2015). In a sample of adolescent males in the juvenile detention system, those who reported gang affiliation were 5.7 times more likely to report being sexually active, 3.2 times more likely to have gotten a female pregnant in the two months before being detained, and 3.4 times more likely to have multiple concurrent partners in the two months before being detained (Voisin et al., 2004). Consistent with this, in previous work, Lynn (2011) has documented various studies indicating patterns of higher fertility amongst criminal sub-populations. Furthermore, the fecundity and concomitant population growth characteristic of nations that score relatively high on global indices of criminality is considerably higher than in the case of those characterized by low-levels of criminality (Woodley & Fernandes, 2014). These examples illustrate that a predisposition towards aggression and a tendency towards affiliation with so-called delinquent groups may confer real evolutionary benefits such as access to sexual partners in certain environments and under certain selection regimes. This in turn calls into consideration the validity of Western normative preferences as a basis for denoting whether these strategies are 'bad' as from the Darwinian standpoint, they are merely 'adaptive' and possibly even 'optimal' especially when considered in the context of potential corresponding losses in fitness incurred by those with slow strategies practicing reproductive control, or alternatively having to cope with environmental instability and harshness.

5. Methodological considerations

Lynn provides a review of multiple domains of pathology, including rates of ADHD and conduct disorder by race. The review is further bolstered by consideration of cross-country rates of crime and pathology. Whilst there are certainly strengths to Lynn's 'shotgun' approach to sorting through the relevant literature, an alternative approach may have conferred extra rigor on Lynn's findings. Firstly, a possible limitation to Lynn's approach is that the data collected across the various domains of psychopathic behavior appear not to have been systematically collected. A hypothesis as important and controversial as Lynn's would surely benefit from a more systematic review of publications, which would encompass stringent qualitative and quantitative inclusion and exclusion criteria for the data provided. This would in turn have helped to fortify Lynn's important findings against potential accusations of 'cherry-picking'. One important counter to this, and a potential strength of Lynn's approach, is that at high-levels of aggregation, error variance is typically minimized (Lubinski & Humphreys, 1996), which leads to the prediction that barring significant selection bias on Lynn's part, these results should replicate even when stringent selection rules are applied. Second, if the review was systematic, the data points presented as Cohen's *d*'s could have been aggregated to yield more stable and sample-weighted parameter estimates consistent with Type-II meta-analysis (Card, 2011). Using Meta-analytic techniques would also provide a robust test of heterogeneity, allowing for an assessment of sample-specific moderators such as socioeconomic status or other variables that would subject the hypothesis to alternative interpretations and modes of refutation. Being able to operationalize and correct for sources of measurement error would also increase confidence in these findings (Schmidt & Hunter, 2014). Future research on this topic should consider using these advanced meta-analytic techniques.

5.1. Implementation of life history theory in criminal justice research

The central thesis of this commentary is that the emergence of racial differences in individual variation may be the product of contextual forces influencing the manifestation of life history strategies. As such, we argue that criminal justice researchers should incorporate

hypotheses derived from evolutionary theory, which note Lynn (2002) to his credit did in his article; however, as we also note, even at the time, life history theory was considerably more advanced and should have been made more central to his research than it was.

In addition, criminal justice research may also benefit through the incorporation and implementation of life history measures at all levels of aggregation. The usage of a composited slow life history factor that subsumes across various behavioral, social, and personality competencies – such as the *Mini-K* (Figueredo et al., 2006) or the *Arizona Life History Battery* (Figueredo, 2007) – has generated considerable debate among evolutionary psychologists (e.g., Copping, Campbell, & Muncer, 2014; Copping, Campbell, Muncer, & Richardson, 2017; Figueredo et al., 2015). However, non-evolutionary or "traditional" subfields of psychology, including health (Puterman & Epel, 2012), development (Card & Barnett, 2015), and personality (Liu, Reed, & Girard, 2017) and have separately converged and put forth the usage of multi-faceted factors of resiliency with much similarity to psychometric measures of slow life history strategies. For instance, Puterman and Epel (2012) have proposed a construct called *multi-system resiliency* that subsumes psychological resources, prosocial connections, and health-maintaining behaviors as an important moderator between psychosocial stress and aging. Much like slow life history strategists, individuals with greater multi-system resiliency possess cognitive factors that promote greater planning, control, and future orientation; these individuals also are surrounded by and cultivate strong social connections with conspecifics; finally, individuals with greater multi-system resiliency are oriented toward investing in their long-term health (i.e., greater somatic effort) by engaging in physical activity and sleeping and eating well. Inclusion of various newer life history measures may highlight important findings of interest to criminal justice researchers looking to investigate racial and individual in criminogenic traits.

6. Conclusion

In conclusion, modern iterations of Life History theory and derivative models which take into account the phylogenetic and ontogenetic context of both individual and group differences provide a better meta-theoretical rubric within which the adaptive logic of the coherence of psychopathic traits can be analyzed. It is therefore difficult to justify the use of a descriptive language, latent within which is an absolutist moral reference frame in which slow Life History behaviors are deemed absolutely good and Fast ones deemed absolutely bad, especially under conditions where the former clearly leads to diminished fitness (such as in the modern world, when growth rates of various populations are compared). On this basis an objective language that is ultimately sensitive to adaptive context is needed in describing these strategies. Life History theory yields such a language, whereas the psychopathology and criminology literatures do not. This is especially important for effectively communicating interesting and potentially important but controversial ideas, as critics of this sort of work frequently conflate facts and values as a basis for ignoring or decrying it (Cofnas, 2015). The use of value-free language (i.e. Fast vs. Slow, rather than 'Psychopathic' vs. 'Altruistic', or 'Criminal' vs. 'Law abiding') reduces the vulnerability of this work to such attempts at deconstruction.

That being said, future analyses testing Lynn's hypothesis should, in addition to taking into account the need for a somewhat more systematic and meta-analytic treatment of the data, including markers of social standing or socioeconomic status. It is possible that race identification may to an extent be serving as a proxy for SES or it could be that these differences continue to hold when covarying for these social factors. Either way, it would increase credence to this hypothesis and other evolutionary models if the possible effects of social privilege can be compellingly controlled. Nor should the focus on race distract from attempts at analyzing the clustering of criminogenic traits at lower levels of taxonomic aggregation such as among the myriad human varieties that exist within the broader racial or continental populations

(Cavalli-Sforza, Menozzi, & Piazza, 1994). Different levels of aggregation will yield different information about the phylogeny of these traits; therefore, analyzing the variability in these traits at all levels of aggregation (from species to the individual level) yields mutually complementary findings. Ultimately, Lynn's hypothesis is both provocative and interesting, however a focus on both the individual and intra-individual differences (i.e. developmental) levels of Life History are required to enhance this model.

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