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RESEARCH ARTICLE

The Relations between Life History Strategy and Dark Personality Traits among Young Adults

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Abstract

Personality traits can coalesce with other characteristics to guide the use of tactics to increase fitness, termed life history strategies (LHSs). A "fast" LHS broadly refers to a strategy of maturing and reproducing early, favoring offspring quantity over quality, and immediate over delayed benefits. A "slow" strategy describes the opposite pattern. Researchers have examined the Dark Triad of Machiavellianism, narcissism, and psychopathy to better understand the adaptive trade-offs of varying LHSs; however, clarity is needed regarding whether the traits of the triad differentially relate to LHS and how other "dark" personality characteristics may correspond to life history. In the current study, 366 young adults completed self-report questionnaires on LHS, the Dark Triad, everyday sadism, and status-driven risk taking. When the shared variance between several dark personality traits was controlled for, Dark Triad narcissism predicted a slow strategy, whereas psychopathy and status-driven risk taking predicted a fast strategy. Machiavellianism and everyday sadism did not emerge as significant multivariate predictors of LHS. Exploratory analyses revealed that Machiavellianism and psychopathy were not redundant in predicting a fast strategy and that narcissism and psychopathy cooperatively suppressed one another in predicting LHS. In addition, everyday sadism and psychopathy may have redundantly predicted a fast strategy. In line with previous work, these results suggest that Dark Triad psychopathy is the strongest multivariate predictor of a fast strategy, whereas narcissism is slower in terms of its life history "speed." We consider that both Machiavellianism and narcissism contain a mélange of fast and slow components that become evident when their shared variance with the other dark personality traits is taken into account.

Keywords Dark Triad · Life history strategy · Everyday sadism · Status-driven risk taking

Life history theory (MacArthur and Wilson 1967; Pianka 1970) is used to describe differences in how species strategically devote resources between the competing demands of survival (i.e., somatic effort), mating, and/or parenting (i.e., reproductive effort; Figueredo et al. 2006). From this perspective, morphological, physiological, and psychosocial characteristics are predicted to cluster non-randomly to form life history strategies (LHSs) to increase fitness. These strategies are argued to help navigate trade-offs among the resources needed to solve adaptive problems posed by the physical, social, and developmental environment. Through life history theory, individual differences in personality are also considered to represent resource investment trade-offs that are heritable, sensitive to environmental conditions, and meaningfully impact a range of evolutionary outcomes (e.g., reproductive success; Figueredo et al. 2005). Because humans are considered to be a relatively social species, it is sensible to examine the relations between LHS and personality traits deemed to be socially desirable (e.g., cooperativeness). It is equally beneficial to consider the selection pressures that may have led to the emergence and maintenance of traits that could conventionally be regarded as socially undesirable (e.g., psychopathy; Jonason et al. 2010). This helps gain potential insight into why "dark" personality traits exist, when they originated, and how they have been shaped by evolutionary

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processes (Holtzman and Strube 2011). Researchers continue to examine and debate how different dark traits may relate to varying LHSs (Book et al. 2015; Jonason et al. 2017a; McDonald et al. 2012). The main objective of our study was to help clarify the relations between LHS and several dark personality characteristics in a sample of young adults.

Life History and Personality

Across and within different animal species, LHSs have been discussed using the metaphor of speed which varies along a "fast" to "slow" continuum. Organisms with a fast LHS invest relatively more in early reproduction, mating effort, and producing numerous offspring with minimal parental care (MacArthur and Wilson 1967; Pianka 1970). In contrast, species with a slow LHS invest relatively more in bodily maintenance and repair, parental effort, and producing fewer, but higher "quality," offspring. Therefore, the core of a fast LHS can be approximated as short-term investment at the expense of future costs, whereas a slow strategy can be approximated as the opposite pattern (Figueredo et al. 2006). The key idea is that animals have finite resources (e.g., time and energy), and effort devoted to solving one adaptive problem typically cannot be redirected to solve other problems that impact an organism's ability to survive and reproduce. Through life history theory, natural and sexual selection are argued to shape the developmental pathways of organisms (e.g., pubertal timing) in response to the demands of the local social-ecological context (e.g., availability of resources, population density, and social conditions). Among humans, within-species differences in LHS are considered to be reliably varying individual differences that reflect these selection pressures (Figueredo et al. 2004; Jonason et al. 2012b). In previous work, researchers have found a range of characteristics that vary predictably among humans in accord with the resource investment allocations described above. For instance, a fast LHS has been associated with sexual precociousness, short-term mating proclivities, impulsivity, and antisociality, whereas a slow strategy has been related to a tendency to form long-term relationships with allies and mates, altruism, greater self-control, and higher psychological and physiological health (see Figueredo et al. 2006 for review).

Life history theory provides a powerful framework within which to understand individual differences in personality (Buss 2009; Figueredo et al. 2005). A large body of evidence supports that personality traits are heritable, associated with life history parameters (e.g., longevity, fertility), and relate to behavioral strategies (i.e., LHSs) that impact an individual's capacity to solve adaptive problems within particular ecological contexts (see Figueredo et al. 2005 for discussion). In particular, life history theory has helped to illuminate how dark personality traits that in many ways are personally and societally damaging, may have been selected for and evolved in response to recurrent adaptive problems faced by ancestral humans (Figueredo et al. 2005; Gladden et al. 2009; Jonason et al. 2010, 2012b, 2017a; Holtzman and Donnellan 2015; McDonald et al. 2012; Mealey 1995). From this perspective, socially deviant traits are argued to form a coherent fast LHS that supports exploitative tendencies to accrue immediate reproductively relevant benefits (Gladden et al. 2009; Mealey 1995). Indeed, several researchers have supported a link between dark personality traits and indicators of a fast strategy (e.g., impulsivity, short-term mating tendencies, and lower levels of empathy; Book et al. 2015; Jonason et al. 2009, 2013).

In examining the associations between dark personality characteristics and LHS, the focus in the literature has been on the Dark Triad of Machiavellianism (manipulative and exploitative), narcissism (grandiose and egoistic), and psychopathy (antisocial and callous; Paulhus and Williams 2002). There has also been a tendency to combine the individual traits of the Dark Triad into a functional composite that is argued to signify, although imperfectly, the same latent disposition, which is consistently related to a fast LHS and indicators of a fast strategy (e.g., short-term mating tendencies and less self-control; Jonason et al. 2010, 2012a; Jonason and Tost 2010). However, when examined separately, the traits of the triad have related inconsistently to a fast strategy Gladden et al. 2009; Jonason et al. 2010, 2017a; Jonason and Tost 2010; McDonald et al. 2012). This makes sense considering that several authors have argued and empirically supported that the traits of the triad vary substantially in terms of how "dark" they are and how aversive and destructive people perceive these traits to be (Rauthmann and Kolar 2012). Some researchers have asserted that the reason for this discrepancy is that particular traits of the triad do not all genuinely relate to a fast LHS (e.g., Book et al. 2015), whereas others have argued that these traits are multifaceted and contain elements of both fast and slow strategies which may be biased by particular measurement instruments (e.g., McDonald et al. 2012). Additionally, some have postulated that redundant variance between some of the traits may account for these discrepant findings (e.g., Jonason et al. 2017a). Therefore, it is evident that more research is needed to help clarify the relations between the members of the Dark Triad and LHS, particularly using statistical methods that permit an assessment of the unique contribution of each variable to the outcome of interest (e.g., multiple regression; Furnham et al. 2013). Furthermore, the Dark Triad is by no means exhaustive of all socially deviant personality traits (Ashton et al. 2010; Buckels et al. 2013; Visser et al. 2014) and there is a current need to examine other dark traits in relation to LHS.

Dark Personality Traits and Life History Strategy

Machiavellianism

Machiavellianism was originally introduced by Christie and Geis (1970) and defined as a trait linked to a cynical worldview, a lack of morality, and manipulativeness, which is reflected in their popular measure for the construct: the MACH-IV. Jones and Paulhus (2009) expanded on this conceptualization to include the themes of planning, coalition formation, and reputation building, which are represented in their popular measure to assess Dark Triad Machiavellianism, the Short Dark Triad (SD3; Jones and Paulhus 2014). Jones and Paulhus (2014) considered these latter three components important to differentiating between Machiavellianism and psychopathy, arguing that Machiavellians do not express the impulsivity and disregard for their friends, families, and reputations that psychopaths do. Hawley (2003, 2006) posited that Machiavellians are "bistrategic controllers" who oscillate between coercive and prosocial tactics to compete for resources. Likewise, Jones and Paulhus (2011) proposed that Machiavellians opportunistically pursue both short-term and long-term mates. Therefore, using the expanded definition by Jones and Paulhus (2009, 2014), Machiavellianism may consist of a mélange of qualities that relate to both fast (e.g., cynicism, immorality, and manipulativeness) and slow LHSs (e.g., careful planning, alliance formation, and reputation management) that manifest in a context-specific manner given the demands and opportunities presented by the social-ecological environment.

Figueredo et al. (2005) originally found that Machiavellianism shared a significant relation with a fast LHS. Following this work, inconsistent evidence was found in support of the relation between Machiavellianism and features of a fast strategy (e.g., lack of self-control, poorer future planning, attentional deficits, short-term mating; Jonason and Tost 2010; Jonason et al. 2010, 2011, 2012a) argued that the positive relations between Machiavellianism and some indices of impulsivity reported by Jonason and Tost (2010) may have been a measurement artifact of the brief scale these authors used to measure the Dark Triad: the Dirty Dozen (Jonason and Webster 2010). Book et al. (2015) have also argued that Machiavellians do not express the impulsivity that is characteristic of Dark Triad psychopathy and core to a fast strategy. Instead, these individuals appear to strategically plan for the future while exploiting others in order to meet those long-term objectives (Jones and Paulhus, 2009, 2011). Like Figueredo et al. (2005), McDonald et al. (2012) argued and empirically supported that Machiavellians enact a fast strategy.

More recently, Jonason et al. (2017a) found a small negative correlation between Machiavellianism and a fast LHS; however, when entered into a multiple regression model with the other traits of the Dark Triad, Machiavellianism did not uniquely predict LHS. These authors considered that Machiavellianism may be redundant with psychopathy, referring to work by Persson et al. (2017) who argued that "…items accurately assessing Machiavellianism and subclinical psychopathy assess the same latent construct (i.e., psychopathy), but at different levels of severity…" (p. 78). Jonason et al. (2017a) also speculated that the removal of shared variance between the two dark traits could lead to the fast (e.g., cynicism) and slow (e.g., long-term planning) facets of LHS canceling each other out. Therefore, it is currently uncertain whether Machiavellianism unequivocally signals a fast strategy (Figueredo et al. 2005; McDonald et al. 2012), or if it contains a mixture of fast and slow components (Book et al. 2015; Hawley 2003, 2006; Jones and Paulhus 2009, 2011). It is also possible that Machiavellianism and psychopathy are redundant (Persson et al. 2017), which becomes evident when the shared variance between these two constructs is controlled (Jonason et al. 2017a).

Narcissism

Most researchers agree that narcissism is a heterogeneous construct linked to a strong sense of self-entitlement, a need for admiration from others, an unrealistic sense of superiority (i.e., grandiosity), a desire to be the center of attention, and a tendency to be interpersonally exploitative (Emmons 1987; Foster and Campbell 2007; Raskin and Terry 1988; Schmitt et al. 2017). Several authors have argued that a more socially adaptive form of narcissism is evident (i.e., grandiose narcissism) linked to leadership, self-confidence, positive mood, well-being, and life satisfaction, (Cater et al. 2011; Dickinson and Pincus 2003; Egan et al. 2014; Miller et al. 2011; Miller and Campbell 2008; Rohmann et al. 2012). In contrast, vulnerable narcissism is argued to be socially maladaptive and associated with ego-sensitivity, hostility, negative emotionality, and interpersonal dysfunction. The former, grandiose narcissism, appears to denote a slow LHS, whereas the latter, vulnerable narcissism, seems to be characterized by a fast strategy (Figueredo et al. 2006). However, this distinction is not consistently made in research on narcissism, as various conceptualizations of this personality trait, and measurement tools designed to assess it, predominate the literature (Miller and Campbell 2008; Miller et al. 2011). Therefore, it is likely that different measures of narcissism are picking up on particular facets or forms of the construct that differentially relate to LHS (Jonason et al. 2017a; McDonald et al. 2012). This would help to account for some of the mixed findings in the literature.

Dark Triad narcissism is more in line with the grandiose variant of the construct (Jones and Paulhus 2014); but, again is defined and assessed somewhat differently across researchers. Jonason and Webster (2010) described Dark Triad narcissism

as embodying attention seeking, status striving, and entitlement on their brief measure of the Dark Triad (the Dirty Dozen Scale). Researchers using this scale have reported stronger relations between Dark Triad narcissism and indicators of a fast strategy such as impulsivity, sensation-seeking, attentional deficits, and short-term mating, as well as lower levels of conscientiousness and self-esteem (Crysel et al. 2013; Jonason et al. 2012a; Jonason and Tost 2010; Jonason and Webster 2010). Using this scale, Jonason et al. (2013) also found a small negative correlation between narcissism and LHS ($r = -0.13$), as measured with the Arizona Life History Battery (Figueredo et al. 2004), indicating a fast strategy, which was driven by short-term mating tendencies; however, when entered into a multiple regression model with the other members of the Dark Triad, narcissism was not a unique multivariate predictor of life history. Perhaps then, short-term mating is the driving force of the relation between Dark Triad narcissism and a fast strategy (Jonason et al. 2017a; Schmitt et al. 2017). This is in line with Holtzman and Strube's (2011) proposal that selection may have favored narcissism among humans as a unique variant of dominance which primarily facilitated enacting a short-term mating strategy (e.g., one-night stands). This strategy would have been particularly effective for men, for whom dominance is typically more directly parlayed into mating opportunities (Holtzman and Donnellan 2015).

Similar to Jonason and Webster (2010), Jones and Paulhus (2014) described Dark Triad narcissism as connected to self-enhancement, feelings of superiority, and entitlement, but with the addition of leadership ability which is represented on their measure for the Dark Triad (the SD3). Researchers using this scale appear to have supported more links between narcissism and indicators of a slow strategy. For example, narcissism has been related to lower levels of neuroticism, less unethical behavior, higher conscientiousness, subjective happiness, leadership vocational interests, and consideration of future consequences, as well as the ability to adapt to uncertainty, crises, and interpersonal situations (Book et al. 2015, 2016; Garcia and Moraga 2017; Jonason et al. 2017a; Malesza et al. 2017; Roeser et al. 2016; Smith and Webster 2018; Visser et al. 2014). Using the SD3, Jonason et al. (2017a) recently found a small positive correlation between Dark Triad narcissism and a slow strategy (measured with the Mini-K; $r = 0.18$). When entered into a multiple regression model with Machiavellianism and psychopathy, these authors also found that narcissism uniquely predicted a slow strategy, and speculated that narcissism may: (1) genuinely be a slow trait, (2) biased by measures that do not allow for facet-level examinations, or (3) fast only in relation to sexual and romantic relationships but not globally. Given these considerations and the results described above, it is evident that more empirical work is needed to tease apart the relations between Dark Triad narcissism and LHS.

Psychopathy

Unlike Machiavellianism and narcissism, psychopathy has been far more consistently related to a fast LHS regardless of how it is assessed. In previous work, psychopathy has been connected to short-term mating (Book et al. 2016; Jonason et al. 2012a), intimate partner violence (Swogger et al. 2007), a lack of self-control, and a diminished capacity to think of the future consequences for one's current behavior (Jonason and Tost 2010), as well as a fast strategy (Gladden et al. 2009; Jonason et al. 2010) as assessed through the Arizona Life History Battery (Figueredo et al. 2004) and Mini-K (Figueredo et al. 2006). Psychopathy has also been related to low levels of personality traits that denote a fast LHS, such as lower agreeableness and conscientiousness (Jakobwitz and Egan 2006; Paulhus and Williams 2002). However, McDonald et al. (2012) found that psychopathy, like narcissism, embodies elements of both a fast and slow strategy. These authors demonstrated that the impulsive, erratic, and antisocial lifestyle aspects of psychopathy were associated with a fast strategy, whereas fearless dominance (i.e., social boldness) was linked to a slow LHS. Although psychopathy may contain a quality of a slow strategy, the Dark Triad focuses on the impulsive, emotionally labile, and antisocial variant of psychopathy (i.e., secondary psychopathy; Levenson et al. 1995; Jones and Paulhus 2014) that is more in line with a fast LHS. Moreover, several authors have noted that Dark Triad psychopathy appears to be the "darkest" trait of the three and shares the strongest relation with a fast strategy among the members of the triad (Jonason et al. 2010, 2017a; Rauthmann and Kolar 2012).

Everyday Sadism and Status-Driven Risk Taking

The Dark Triad has been considered by some to be exhaustive of evil personalities, but two more dark traits have been proposed that likely bear on LHS. Buckels et al. (2013) found that everyday sadism—the general enjoyment in the pain and suffering of others—correlated positively with the Dark Triad traits, exploitativeness, and short-term mating. Furthermore, these authors found negative associations between everyday sadism, agreeableness, and conscientiousness. These relations suggest that sadism is linked to a fast LHS (Book et al. 2016). Sadism does, however, overlap substantially with Dark Triad psychopathy, and it is important to examine the unique variance accounted for by this dark personality trait in predicting LHS (Jonason et al. 2017b). Status-driven risk taking, the pursuit of financial and social gains in the face of risk and harm (Ashton et al. 2010), may be another dark trait. Visser et al. (2014) found that this personality characteristic was linked to antisocial tendencies, as well as low levels of agreeableness and conscientiousness. Status-driven risk taking is interesting because it presumably contains both elements of

a fast (e.g., risk taking) and slow LHS (e.g., agentic striving for status and material resources), whereas sadism appears to clearly signal a fast strategy. However, previous evidence suggests that status-driven risk taking is likely related to a fast strategy.

Overview of the Present Research

The purpose of the present study was to examine how LHS may relate differentially to the members of the Dark Triad (Machiavellianism, narcissism, and psychopathy) in addition to the dark personality traits of everyday sadism and status-driven risk taking. As recommended (e.g., Furnham et al. 2013), we used multiple regression analysis to control for the shared variance among the members of the Dark Triad and our other dark personality traits in predicting LHS to assess the unique contribution of each variable. Based on the literature review presented above, and the results found by Jonason et al. (2017a) specifically, we expected that Dark Triad narcissism as assessed with the SD3 (Jones and Paulhus 2014) would predict a slow strategy, whereas Dark Triad psychopathy, everyday sadism, and status-driven risk taking would predict a fast strategy when entered into a multiple regression model simultaneously. We did not anticipate that Dark Triad Machiavellianism would uniquely predict LHS amidst the other dark personality traits.

Participants

The current study included 366 participants recruited from undergraduate psychology courses at a university in Ontario, Canada. In regard to biological sex, 52.2% ($n = 191$) indicated that they were female and 45.4% ($n = 166$) were male (0.8% [$n = 3$] selected "other" and 1.6% [$n = 6$] declined to respond). The mean age of the sample was 21.02 years ($SD = 4.91$) with a range of 17–53 years. In terms of race, 80% ($n = 293$) of the sample identified as Caucasian.

Measures

The Mini-K

This is a 20-item abridged version of the Arizona Life-History Battery (Figueredo et al. 2004), a collection of scales measuring cognitive, affective, and behavioral indicators of LHS, wherein participants responded to statements along a seven-point Likert scale. The Mini-K measures LHS along a socially oriented continuum with higher scores being indicative of a slow strategy and lower scores signaling a fast strategy. This instrument is designed to measure seven key facets of LHS including: insight, planning, and control (e.g., "I am good at figuring out how things will turn out"), parent relationship quality (e.g., "While growing up, I had a close and warm relationship with my biological mother"), family contact/support (e.g., "I often get emotional support and practical help from my blood relatives"), friends contact/support (e.g., "I am often in social contact with my friends"), general altruism (e.g., "I am closely connected and involved in my community"), religiosity (e.g., "I am closely connected to and involved in a religion"), and attachment to romantic partners (e.g., "I have to be closely attached to someone before I am comfortable having sex with them"). Because we sampled from an undergraduate student population, item number 9 "I have a close and warm relationship with my own children" was removed. Participants were prompted to respond "not applicable" for item 10 "I have a close and warm romantic relationship with my sexual partner" if they did not currently have a romantic or sexual partner. This 19-item, or 18-item if single, version of the Mini-K was found to have good internal consistency reliability, as assessed with Cronbach's alpha ($\alpha = 0.78$).

Short Dark Triad 3 (SD3)

This scale, created by Jones and Paulhus (2014), is a brief measure of three socially aversive traits known as Machiavellianism, narcissism, and psychopathy, which comprise the "Dark Triad." Participants responded to items on a five-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Items on the Machiavellianism subscale represent callous affect, a tendency to manipulate, and to be tactical and strategic (e.g., "I like to use clever manipulation to get my way"). Items for the Psychopathy subscale are associated with impulsivity, the absence of empathy, and criminality (e.g., "I like to get revenge on authorities"). Items on the Narcissism subscale assess grandiosity and the need for ego-reinforcement (e.g., "Many group activities tend to be dull without me"). The three-factor structure of the SD3 has been validated on undergraduate and community samples (Jones and Paulhus 2014). The internal consistency values for Machiavellianism, $\alpha = 0.78$, narcissism, $\alpha = 0.71$, and psychopathy, $\alpha = 0.73$, all fell within an acceptable range.

Status-Driven Risk Taking Scale

This scale was created by Ashton et al. (2010) and measures a tendency to disregard physical risk in the pursuit of avarice. Participants responded to items along a five-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Items tap into a tendency to pursue wealth and power in the face of potential physical harm (e.g., "I would enjoy being a famous and powerful person, even if it meant a high risk of assassination"). The Status-Driven Risk Taking Scale was

found to have high internal consistency in the present study ($\alpha = 0.87$).

Varieties of Sadistic Tendencies Scale

This 16-item scale was developed by Paulhus and Jones (2015) and was designed to measure an individual's enjoyment of cruelty in their day-to-day life (e.g., "I was purposely cruel to someone in high school"), and has been argued to be the fourth "prong" of the "Dark Tetrad" (Buckels et al. 2013). Participants responded along a five-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The Varieties of Sadistic Tendencies Scale was found to be internally consistent in the present study ($\alpha = 0.83$).

Procedure

Through a digital recruitment message and poster advertisements, undergraduate students were invited to participate in the "Dark Personality Study." If interested, participants were directed to an online survey hosted by SONA™, where they were presented with study information and then provided informed consent prior to participating. After agreeing to the provisions listed, participants indicated their agreement to voluntarily participate by clicking "next" to continue onto the survey. Upon completing the survey, participants were compensated with partial course credit.

Results

Data were analyzed using SPSS (version 20). Descriptive statistics were generated for each measure (see Table 1). Histograms, skewness, and kurtosis statistics were calculated to examine the distributions of our variables. The data for each mean scale score approximated a normal distribution. Independent samples *t* tests were carried out in order to examine any potential sex differences across variables (see Table 1). Women reported favoring a slow LHS to a greater extent than did men. We also found significant sex differences across all of our dark personality measures, with men scoring higher than women on each trait.

Zero-order correlations were calculated to explore the relations between all of the measured variables (see Table 2). Of note, Machiavellianism, psychopathy, everyday sadism, and status-driven risk taking all shared significant negative correlations with the Mini-K (indicating a fast LHS), whereas narcissism failed to correlate significantly with LHS. Due to the *t* test results regarding biological sex, correlations were also conducted for women and men separately. Fisher *r*-to-*z* transformations indicated that none of the correlations for women and men were significantly different from one another.

A multiple regression analysis was used to test our predictions (see Table 3 for results). We also decided to examine whether sex significantly moderated any of the potential relations between the dark personality traits in predicting LHS. Sex (coded 1 = women and − 1 = men) was entered at the first step of the analysis with each mean centered predictor variable. At the second step, mean centered interaction terms were entered into the regression model. Biological sex was not found to significantly moderate any of the relations between the dark personality characteristics and LHS; therefore, follow-up analyses were not necessary. As predicted, when the shared variance among the dark personality traits was controlled, narcissism uniquely predicted a slow LHS, whereas psychopathy and status-driven risk taking predicted a fast strategy. Additionally, Machiavellianism did not uniquely predict LHS. However, contrary to our expectation, everyday sadism also failed to uniquely predict LHS.

Exploratory Analyses

Given our results, and considering more intently the speculations described by Jonason et al. (2017a), we decided to run some additional analyses. Specifically, we thought that it would be fruitful to test whether Machiavellianism and psychopathy were redundant in predicting LHS. If so, two criteria

Table 1 Descriptive statistics for all measures and sex differences

	Total		Women		Men			
	N	*M* (SD)	*n*	*M* (SD)	*n*	*M* (SD)	*t*	*d*
Mini-K	366	5.12 (0.75)	191	5.22 (0.73)	166	5.02 (0.73)	2.70**	0.27
Machiavellianism	365	3.14 (0.62)	190	3.02 (0.62)	166	3.29 (0.60)	− 4.19**	0.44
Narcissism	366	2.83 (0.58)	191	2.72 (0.59)	166	2.96 (0.55)	− 3.99**	0.42
Psychopathy	366	2.31 (0.59)	191	2.14 (0.57)	166	2.50 (0.57)	− 5.93**	0.63
Sadism	366	2.18 (0.57)	191	1.98 (0.50)	166	2.41 (0.55)	− 7.79**	0.82
SDRT	366	2.58 (0.56)	191	2.39 (0.51)	166	2.78 (0.54)	− 7.11**	0.74

Participant sex coded as 1 = women, 0 = men. Independent samples *t* test results significant at $^{**}p < 0.01$, two-tailed. Cohen's *d* values for effect size provided for sex differences. SDRT = status-driven risk taking

Table 2 Zero-order correlations between all variables

	1.	2.	3.	4.	5.	6.
1. Mini-K	1.0					
2. Machiavellianism	−0.19**	1.0				
3. Narcissism	0.07	0.25**	1.0			
4. Psychopathy	−0.40**	0.50**	0.31**	1.0		
5. Sadism	−0.34**	0.47**	0.21**	0.61**	1.0	
6. SDRT	−0.37**	0.39**	0.30**	0.54**	0.53**	1.0

Zero-order correlations significant at $^{**}p < 0.01$, two-tailed

needed to be met. First, in predicting LHS, introducing Machiavellianism into a linear regression model with psychopathy as the first predictor should reduce the magnitude of the beta coefficient and there should be no significant change in R^2 (i.e., the coefficient of determination), indicating that the second predictor is not accounting for a significant amount of additional variability in the criterion. Second, introducing psychopathy into a regression model with Machiavellianism as the first predictor of LHS should also reduce the magnitude of a positive or negative beta coefficient with no significant change in R^2. Together, this would represent a redundancy situation (Conger 1974; Paulhus et al. 2004; Tzelgov and Henik 1991). We used linear regression analyses to test this possibility. Machiavellianism by itself negatively predicted the Mini-K (indicating a fast LHS; see Table 4). The inclusion of psychopathy into the regression model resulted in a significant change in R^2 and rendered Machiavellianism a non-significant predictor of LHS. Psychopathy by itself negatively predicted the Mini-K (signaling a fast strategy) but psychopathy's beta weight did not change with the inclusion of Machiavellianism into the regression model, and there was no significant change in R^2. These results indicate that Machiavellianism and psychopathy were not redundant in predicting LHS (Paulhus et al. 2004).

Table 3 Multiple regression analysis

	β	t	p
Sex	−0.02	−0.30	0.761
Machiavellianism	0.03	0.52	0.521
Narcissism	0.24	4.88	< 0.001
Psychopathy	−0.30	−4.64	< 0.001
Sadism	−0.10	−1.55	0.121
Status-driven risk taking	−0.24	−4.10	< 0.001
F		19.38	< 0.001
R^2		0.25	
Machiavellianism × sex	0.10	1.89	0.060
Narcissism × sex	−0.03	−0.63	0.531
Psychopathy × sex	0.06	1.04	0.301
Sadism × sex	0.04	0.75	0.457
Status-driven risk taking × sex	−0.07	−1.16	0.248
F		11.61	< 0.001
R^2 Δ		0.02	0.083

We also considered whether a suppression situation existed between narcissism and psychopathy in predicting LHS. A suppressor situation can be defined as a circumstance where a predictor variable's zero-order correlation with the criterion (i.e., its validity) is non-significant, but when entered simultaneously into a regression model with another predictor it improves one or both validities (Paulhus et al. 2004; Tzelgov and Henik 1991). There are different kinds of suppressor effects (see Paulhus et al. 2004 for further discussion) and given our results we decided to test whether narcissism and psychopathy cooperatively suppressed one another in predicting LHS. Cooperative suppression occurs when two predictors correlate positively with one another, but have opposite signs in relation to the outcome variable (Cohen and Cohen 1975; Paulhus et al. 2004). Including both predictors in a regression model controls for their overlap and increases their predictive power (i.e., their beta weights). Alone, narcissism did not significantly predict LHS; however, when psychopathy was included in the regression model, then narcissism positively predicted LHS (indicating a slow strategy), resulting in a significant change in R^2 (Table 4). Alone, psychopathy negatively predicted the Mini-K (conveying a fast strategy), and its beta weight increased in magnitude with the inclusion of narcissism, which corresponded to a significant change in R^2. We used the Sobel test to examine whether the suppressor effects were statistically significant (MacKinnon et al. 2000). The effect of narcissism on a slow LHS increased significantly when psychopathy was included in the regression model ($z = -4.16$, $p < 0.001$), while the effect of psychopathy on a fast LHS increased significantly with the addition of narcissism in the model ($z = 3.15$, $p = 0.002$). These results support that narcissism and psychopathy were cooperatively suppressing one another in predicting LHS.

Following the argument by Jonason et al. (2017b) regarding the significant overlap between psychopathy and sadism, we also endeavored to examine whether the relation between these two traits represented a redundancy situation in predicting LHS. Everyday sadism alone negatively predicted the Mini-K (indicating a fast LHS) and its beta coefficient was reduced with the inclusion of psychopathy in the regression model; however, this did result in a significant change in R^2 (Table 4). In addition, psychopathy negatively predicted the Mini-K (conveying a fast strategy), and its beta coefficient was reduced with the inclusion of sadism; however, again there was a significant change in R^2. Therefore, there is mixed evidence that everyday sadism and psychopathy were redundant in predicting LHS. Both variables reduced the beta coefficient of the other predictor (indicating redundancy), but they

Table 4 Redundancy and suppressor regression analyses

	Y = LHS					
Model 1	X_1 = Machiavellianism			X_1 = psychopathy		
	β alone	β with psychopathy	R^2 Δ	β alone	β with Machiavellianism	R^2 Δ
	− 0.20**	0.00	0.12**	− 0.40**	− 0.40**	0.00
Model 2	X_1 = narcissism			X_1 = psychopathy		
	β alone	β with psychopathy	R^2 Δ	β alone	β with narcissism	R^2 Δ
	0.07	0.21**	0.19**	− 0.40**	− 0.46**	0.04**
Model 3	X_1 = sadism			X_1 = psychopathy		
	β alone	β with psychopathy	R^2 Δ	β alone	β with sadism	R^2 Δ
	− 0.34**	− 0.16*	0.06**	− 0.40**	− 0.30**	0.02*

Standardized beta coefficients (β) and F-statistics significant at $^*p < 0.05$ and $^{**}p < 0.001$, two-tailed

also accounted for a significant amount of additional variability in predicting the criterion (suggesting an absence of redundancy; Paulhus et al. 2004; Tzelgov and Henik 1991).

Discussion

Life history theory (MacArthur and Wilson 1967; Pianka 1970) is a powerful lens through which the adaptive costs and benefits of personality may be investigated. We set out to examine whether the traits of the Dark Triad (Paulhus and Williams 2002) collectively signal a fast LHS or whether Machiavellianism, narcissism, and psychopathy vary in terms of their life history "speed" among young adults (Book et al. 2015; Jonason et al. 2017a; McDonald et al. 2012). Additionally, we wanted to study the predictive power of a variety of dark personalities and so assessed everyday sadism (Buckels et al. 2013) and status-driven risk taking (Ashton et al. 2010; Visser et al. 2014) in relation to LHS in conjunction with the triad. When the shared variance between each dark personality trait was controlled, in partial support of our hypothesis, Dark Triad psychopathy and status-driven risk taking predicted a fast strategy, whereas Dark Triad narcissism predicted a slow LHS. In addition, Dark Triad Machiavellianism did not predict life history. Contrary to our expectation, sadism did not emerge as a unique multivariate predictor of a fast LHS amidst the other dark personality traits. Moderation analyses revealed that none of the relations between LHS and the dark traits were significantly moderated by biological sex. These results support the argument that the traits of the Dark Triad are differentially associated with LHS and that this nuance is lost when viewed and assessed as a unitary construct (i.e., a Dark Triad composite; Jonason et al. 2017a).

Dark Triad Machiavellianism, as measured with the SD3 (Jones and Paulhus 2014), is defined by a cynical worldview, long-term planning, reputation, and coalition building (Jones and Paulhus 2009), which does not evidently signal a fast or slow LHS (Book et al. 2015). Strategizing, consideration for one's reputation, and banding together with allies in the interim to achieve a long-term goal, all theoretically appear to be linked to a slow LHS (Figueredo et al. 2006), whereas cynicism, immorality, and a proclivity to exploit others seem to indicate a fast strategy. Like Jonason et al. (2017a), we found that Machiavellianism shared a small correlation with a fast LHS that was reduced to non-significance when the shared variance among several other dark personality traits was controlled. Therefore, it seems unlikely that Machiavellianism unequivocally signals a fast strategy (e.g., Figueredo et al. 2005; McDonald et al. 2012), perhaps due to the fast (e.g., cynicism) and slow components (e.g., alliance formation) canceling one another out in the context of a multiple regression with other dark personality traits (Jonason et al. 2017a). In our exploratory analyses, we also considered whether Machiavellianism and psychopathy may be redundant in predicting LHS (Jonason et al. 2017b; Persson et al. 2017). Evidence suggested that these two dark traits were not redundant with one another. Instead, psychopathy appears to be a much stronger bivariate and multivariate predictor of a fast strategy than Machiavellianism, which has been found and emphasized by other authors (e.g., Jonason et al. 2010), and that Machiavellianism may contain a mixture of fast and slow qualities (Book et al. 2015; Hawley 2003, 2006; Jones and Paulhus 2009, 2011).

Dark Triad narcissism, as assessed with the SD3, is linked to leadership ability, self-enhancement, feelings of superiority, and entitlement (Jones and Paulhus 2009, 2014). This grandiose variant of narcissism has been associated with a slow strategy in previous work (Jonason et al. 2017a). In the current study, we found that narcissism did not predict LHS on its own, but uniquely predicted a slow strategy when entered simultaneously into a multiple regression model with several other dark personality traits. This result suggests that Dark Triad narcissism is slower than Machiavellianism and psychopathy, but that it is likely not a genuinely slow trait. Rather, Dark Triad narcissism may contain a mixture of some fast (e.g., short-term mating) and slow components (e.g., leadership ability, self-sufficiency, and authority; Jonason et al.

2017a). Therefore, measurement instruments that emphasize particular facets or forms of narcissism (e.g., grandiose versus vulnerable; Miller et al. 2011) at the neglect of others likely impact the relations between this dark trait and LHS.

Because narcissism had a non-significant bivariate relation with LHS and a significant multivariate effect on a slow strategy, in addition to psychopathy being the strongest bivariate and multivariate predictor of a fast strategy, we considered and tested whether narcissism and psychopathy cooperatively suppressed one another in predicting LHS (Cohen and Cohen 1975; Paulhus et al. 2004; Tzelgov and Henik 1991). Evidence suggested that narcissism and psychopathy were cooperatively suppressing one another in predicting LHS, as both of their beta coefficients increased with the addition of the other in a linear regression model. Therefore, the shared variance in narcissism and psychopathy likely corresponds to a fast strategy. When this shared variance is removed, "psychopathy-free" Dark Triad narcissism appears to relate primarily to a slow strategy, whereas "narcissism-free" Dark Triad psychopathy is more strongly connected to a fast strategy (Paulhus et al. 2004).

Dark Triad psychopathy is associated with impulsivity, callousness, antisociality, and short-term manipulation (Jones and Paulhus 2009, 2014), falling more in line with secondary, as opposed to primary, psychopathy (Levenson et al. 1995). This kind of psychopathy has been consistently linked to a fast LHS and indicators of a fast strategy in previous research (Figueredo et al. 2006), which we found further support for in the current study. Although Dark Triad psychopathy may contain a quality of a slow strategy (fearless dominance; McDonald et al. 2012), our results are in line with those found by other researchers that psychopathy is the strongest bivariate and multivariate predictor of a fast LHS when the shared variance among several dark personality traits is controlled (e.g., Jonason et al. 2010, 2017a). Furthermore, this result supports the argument that psychopathy is a "darker" and more socially damaging personality trait than the other members of the Dark Triad (Rauthmann and Kolar 2012).

Although correlating with a fast strategy, everyday sadism did not uniquely predict LHS in our multiple regression model with the other dark personality characteristics. Therefore, taking enjoyment in the pain of others and finding entertaining societally sanctioned forms of violence and cruelty (e.g., mixed martial arts; Buckels et al. 2013) does not appear to be a strong driver of a fast life history when measured alongside other dark personalities. Some authors have argued that sadism and psychopathy are redundant with one another (e.g., Persson et al. 2017), which would help to clarify the mixed bivariate and multivariate results described above in the current study. In our exploratory analyses, we found that, when predicting a fast strategy, there was some evidence that everyday sadism and psychopathy were redundant with one another, as both beta coefficients were reduced when entered into a regression model together in comparison to the bivariate context (Conger 1974; Paulhus et al. 2004; Tzelgov and Henik 1991). However, both psychopathy and sadism accounted for a significant amount of additional variability above one another in predicting a fast strategy. Therefore, there may be something unique about each trait in relation to a fast strategy, but it is clear that both traits tap very similar qualities in line with a fast LHS. In contrast, status-driven risk taking both correlated with and was a unique multivariate predictor of a fast LHS amidst several dark personality traits. Therefore, the tendency to seek status and material wealth by engaging in short-term high-risk activities (e.g., working with explosives in exchange for higher pay; Ashton et al. 2010; Visser et al. 2014) is associated with a fast strategy. This finding is interesting because, although a drive for status, prestige, and resources can be associated with a slow LHS, acquiring these things may ultimately depend on the relative level, and timing, of the risk(s) involved. It would be fruitful in future research to examine what level of danger is acceptable for those with a slow LHS before the benefits of gaining status and wealth are deemed to be too risky, and whether the timing of the risk impacts this decision.

Limitations and Implications

Several limitations of the current work are worth noting. We relied on a convenience sample of Canadian university students, which limits the generalizability and representativeness of our findings. The cross-sectional nature of the research also precluded an analysis of potential causal mechanisms, as well as the stability of personality traits and LHS across time within participants. Furthermore, our psychometric measure of LHS (i.e., the Mini-K; Figueredo et al. 2006) is an abridged version of a more comprehensive instrument (i.e., the Arizona Life-History Battery; Figueredo et al. 2004), which prevented an examination of the facets of LHS (e.g., experiences in close relationships, kin involvement, etc.). However, the Mini-K has been demonstrated to be a psychometrically sound self-report measure cross-culturally (Figueredo et al. 2015; Richardson et al. 2017). In addition, we did not account for random responding among our participants, which could have potentially affected the relations between variables, such as those between narcissism and psychopathy (Holtzman and Donnellan 2017). Moreover, we did not include other measures for narcissism (e.g., Narcissistic Personality Inventory; Raskin and Terry 1988) and psychopathy (e.g., the Primary Psychopathy Scale; Levenson et al. 1995), preventing a more detailed analysis of the subtypes of psychopathy (i.e., primary and secondary) and the individual facets of narcissism (e.g., leadership/authority and exhibitionism/entitlement), which likely vary in their life history "speed" (McDonald et al. 2012; Jonason et al. 2017a). Future investigations are needed

to address this gap. Importantly, in our exploratory analyses, we examined redundancy and cooperative suppression in the context of the traditional three-variate scenario (i.e., two predictors and one criterion), which does not necessarily apply when additional predictors create a complex pattern of changes (Paulhus et al. 2004; Shieh 2006; Tzelgov and Henik 1991). Few researchers have examined redundancy and suppressor effects in cases where $p > 2$, and since the traits of the Dark Triad tend to be assessed simultaneously, it would be beneficial for future researchers to investigate if similar or different redundancy and suppressor effects emerge in the context of multiple regression.

The current work has several noteworthy theoretical and practical implications. We point to the variability and theoretical clarity that can be lost when solely examining the Dark Triad as an aggregate of major personality characteristics in relation to life history. Indeed, previous researchers have cautioned that a single dimension approach to personality and LHS may be problematic due to the complexity inherent in these constructs and their relations with one another (e.g., Holtzman and Senne 2014; Holtzman and Strube 2013; Jonason et al. 2017a). We present evidence that Machiavellianism may not indisputably signify a fast LHS as previously suggested, but likely embodies a mélange of fast (e.g., exploitativeness) and slow qualities (i.e., long-term strategizing), which becomes apparent when the shared variance among Machiavellianism and several other dark personality traits is controlled (Jonason et al. 2017a). We also showed that Machiavellianism is not redundant with psychopathy in predicting LHS. The finding that narcissism and psychopathy cooperatively suppressed one another when predicting LHS is novel and suggests that narcissism is not genuinely slow, but slower than Machiavellianism and psychopathy because it likely contains several qualities linked to a slow strategy (e.g., leadership ability) that manifest in the presence of other dark personality traits. It may be that narcissism was selected for because it supported a dominance-based, short-term mating strategy linked to a fast strategy (Holtzman and Strube 2011) or that narcissism contributed to leadership ability, agency, confidence, and self-sufficiency in line with a slow LHS. Like Book et al. (2016), we found that everyday sadism is connected to a fast LHS at the bivariate level, and shed some novel light on a potential redundancy situation between sadism and psychopathy in predicting LHS. Furthermore, to our knowledge, we are the first the examine LHS in relation to status-driven risk taking as another dark personality trait (Visser et al. 2014), which appears to be another key driver of a fast strategy alongside psychopathy.

As recommended when assessing the members of the Dark Triad (Furnham et al. 2013), we endeavored to examine the unique variance associated with each of the dark traits in predicting LHS as opposed to the total variance associated with each personality characteristic. Because our data were analyzed to investigate the unique contribution of each dark trait to LHS, our analyses may not speak to how these traits relate to LHS when their total (unique and shared) variance is measured. Although this does limit some practical uses of our results (e.g., a lone measure of Machiavellianism is likely to predict a fast LHS), our findings do allow us to better highlight the unique evolutionary pressures that may have been associated with each dark trait.

Conclusion

The unique components of Dark Triad Machiavellianism (Jones and Paulhus 2009, 2014) do not appear to strongly relate to a fast or slow strategy. This finding supports the idea that Machiavellianism may contain elements of both strategies that emerge in context-specific ways, which becomes salient when the shared variance among several dark personality traits is controlled for (Book et al. 2015; Hawley 2003, 2006; Jonason et al. 2017a; Jones and Paulhus 2011). The grandiose variant of narcissism embodied in the Dark Triad emerges as a unique predictor of a slow strategy when analyzed alongside other dark personality characteristics. In fact, Dark Triad narcissism and psychopathy may cooperatively suppress one another in predicting LHS. This indicates that the unique components of narcissism are likely slower than the unique aspects of Machiavellianism and psychopathy in terms of its life history "speed." Similar to Machiavellianism, the global concept of narcissism may therefore contain elements of both a fast a slow strategy (McDonald et al. 2012). The impulsive and antisocial variant of psychopathy (i.e., secondary psychopathy; Levenson et al. 1995) captured by Dark Triad psychopathy principally denotes a fast LHS associated with short-term mating, risk taking, and exploitation. Everyday sadism alone correlated with a fast strategy at the bivariate level, but this dark trait may be redundant with psychopathy in predicting LHS. A motivation toward taking dangerous risks to acquire status and material wealth (i.e., status-driven risk taking; Ashton et al. 2010) is predictive of a fast LHS both by itself and amidst several other dark personality traits. The above findings provide insight into how a range of varying cross-culturally validated personality characteristics may have evolved through the mechanisms of natural and sexual selection, as well as the adaptive benefits that they might have conferred in ancestral environments.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Informed Consent Informed consent was obtained from all adult participants.

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