Schizotypal Traits and the Dark Triad From an Ecological Perspective: A Nonclinical Sample Study

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Abstract
The Dark Triad is a collection of socially aversive personality traits, namely subclinical psychopathy, Machiavellianism, and subclinical narcissism. These deviant traits, however, contribute to the success of individuals with dark personality traits. Therefore, Dark Triad traits can be conceived as pseudopathologies. Schizotypal traits have also been studied from the perspective of behavioral adaptations. In this study, we investigated whether schizotypal traits were associated with the Dark Triad traits and how schizotypal symptoms can be considered as parts of dark interpersonal strategies that contribute to the individual success of people with dark personality traits. A sample of 277 university students (198 females and 79 males; $M_{\text{age}} = 20.64$; $SD_{\text{age}} = 2.15$) were recruited to fill out the Short Dark Triad and the Schizotypal Personality Questionnaire-Brief Revised. Statistical analyses revealed that Machiavellianism was positively associated with restricted emotional and social life. Narcissism was negatively associated with interpersonal problems. Psychopathy was positively associated with distorted perceptions/cognitions and disorganization. Results of the study are discussed within a behavioral ecology framework. This perspective emphasizes the adaptive values connected to schizotypal personality traits. We further discuss how these adaptive traits fit into strategies of individuals

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with Dark Triad traits, and how these schizotypal traits might restrict or further promote their individual success.

**Keywords**

Dark triad, schizotypal traits, pseudopathology, adaptive value, behavioral ecology

**Introduction**

Linking Dark Triad (DT) traits to dysfunctions of personality has been an extensive focus of research (e.g., Douglas, Bore, & Munro, 2012; McHoskey, 2001; Miller et al., 2010; see Furnham, Richards, & Paulhus, 2013 for a review). However, previous studies ignored the possible relationship between the DT and schizotypy. Moreover, we are the first to use a behavioral ecology framework—namely that of Life History Theory (Belsky, Steinberg, & Draper, 1991; Kaplan & Gangestad, 2005)—to understand the relationship between the DT and schizotypal traits. This approach considers DT traits as pseudopathologies—traits that are socially aversive and threaten the common good but have adaptive benefits for the individual (Crawford & Anderson, 1989; Jonason, Duineveld, & Middleton, 2015). In the presented study, we investigated how schizotypal traits contribute to dark individuals’ distinctive strategies that render them success as social parasites.

**Schizotypal personality**

In relatives of schizophrenic patients, pioneering psychiatrists of the 19th century noted odd personality features such as social isolation, impaired interpersonal functioning, and unusual content of thought and speech (Fanous, Gardner, Walsh, & Kendler, 2001). The constellation of the abovementioned symptoms is referred to as schizotypy (Meehl, 1990; Rado, 1953), i.e., a genetic vulnerability to schizophrenia. Contrasted to the disorganized nature of schizophrenia, schizotypy refers to a form of personality organization.

After separating its symptoms from those of borderline personality disorder, DSM-III (American Psychiatric Association, 1980) introduced schizotypal personality disorder (SPD). Currently in DSM-V (American Psychiatric Association, 2013), characteristic traits for SPD are as follows: (1) eccentricity, (2) cognitive dysregulation, (3) unusual perceptions, (4) unusual beliefs, (5) social withdrawal, (6) restricted affectivity, (7) intimacy avoidance, (8) suspiciousness, and (9) anxiousness. According to recent theorizing (Callaway, Cohen, Matthews, & Dinzeo, 2014; Cohen, Matthews, Najolia, & Brown, 2010; Fossati, Raine, Carretta, Leonardi, & Maffei, 2003; Kelley & Coursey, 1992; Raine & Allbutt, 1989), schizotypal traits represent elements of two (positive, i.e., psychotic-like manifestations and negative, i.e., deficit-like manifestations) or three (cognitive-perceptual deficits, interpersonal difficulties, and disorganization; see the
description of Schizotypal Personality Questionnaire-Brief Revised (SPQ-BR) for details) latent dimensions. Nevertheless, cognitive-perceptual deficits correspond to positive symptoms, whereas interpersonal difficulties correspond to negative symptoms. At the same time, schizotypy should not be considered only at the level of symptoms or as a liability to schizophrenia.

Positive and negative symptoms of schizotypal personality are present in subclinical form in the general population and are associated with various indices of interpersonal and overall functioning, e.g., neuropsychological variables, family relations, and Big Five personality traits (Dinn, Harris, Aycicegi, Greene, & Andover, 2002; Kwapil, Brown, Silvia, Myin-Germey, & Barrantes-Vidal, 2012; Ross, Lutz, & Bailley, 2002; Skodol et al., 2002). Representatives of evolutionary psychopathology have also explained why individually detrimental schizotypal traits might have survived through the history of evolution. According to Del Giudice and his colleagues (Del Giudice, Angeleri, Brizio, & Elena, 2010; Del Giudice, Klimczuk, Traficante, & Maestripieri, 2014), schizotypal traits might have been favored by sexual selection, and accordingly these traits have been suggested to be advantageous in mating and reproduction. Benefits of positive schizotypal symptoms in mating may have come from its relationship with creativity which improves courtship skills. Since positive symptoms of schizotypy are rather connected to acquiring mates than to keeping them, these traits are suggested to promote short-term investment. Thus, positive symptoms of schizotypy represent a manifestation of fast life history strategies. In their evolutionary theory of socialization, Belsky et al. (1991) suggest that individuals use parental practices to calibrate their life history strategy to environmental conditions. Individuals from environments where they have restricted or unpredictable access to resources will adopt a fast life history strategy. This strategy will lead to opportunistic and exploitative interpersonal relationships in general and to low commitment in romantic relationships.

On the other hand, negative schizotypal traits are rather associated with long-term allocation of resources, e.g., parental investment. This resource allocation strategy could be a component of slow life history strategy (Belsky et al., 1991) with trusting interpersonal relationships and commitment on the level of values and interpersonal bonds as well. The third component—disorganization—refers to disorganized thoughts and cognitive slippage, i.e., the loosening of categorical boundaries (Cohen et al., 2010). Although the thought processing style described by disorganization is very similar to divergent thinking including remote associations, there are no consistent results with regard to the relationship between disorganization and creativity (Batey & Furnham, 2008).

This theorizing about the adaptive nature of schizotypal traits can be principally applied to the subclinical range of schizotypal traits rather than to schizophrenic patients. In clinical populations, the expression of schizotypal traits presumably exceeds the extent of adaptiveness and becomes disadvantageous for the individual, requiring hospitalization and psychopharmacological treatment.
The DT

The DT (Paulhus & Williams, 2002) is a collection of personality traits including subclinical psychopathy, subclinical narcissism, and Machiavellianism. According to the existing literature, the common core of the DT is disagreeableness (Paulhus & Williams, 2002), callous–unemotional traits (Jones & Figueredo, 2013), or the lack of honesty and humility (Book, Visser, & Volk, 2015; Lee & Ashton, 2014). Beyond these common characteristics, psychopaths seek stimulation, lack proper behavioral and cognitive control, and act in antagonistic ways (Neumann & Hare, 2008). Narcissists have a grandiose image of themselves; they feel entitled to have the attention of their social environment to ensure permanent approval (Rhodewalt & Peterson, 2011). Machiavellianism is considered to be a strategic variant of the DT with calculated (i.e., long term) social manipulation (Jones & Paulhus, 2011a). In further distinguishing the components of the DT, Paulhus and Williams (2002) used the five-factor model of personality. They found that while disagreeableness was a common core of the DT, psychopaths and narcissists but not Machiavellian individuals were extraverted and open to experience. Lack of conscientiousness characterized Machiavellianism and psychopathy but not narcissism. Moreover, only psychopaths reported themselves to be emotionally stable.

From an evolutionary point of view, fast life history strategy can be considered to be common to all DT traits (Jonason, Koenig, & Tost, 2010). As described earlier, this strategy is related to opportunistic and exploitative interpersonal behavior, low commitment to romantic partners, and to low parental investment. However, with a closer investigation of the goals and the temporal orientation of dark personalities, the relation between DT traits and fast life history strategy can be reevaluated. According to Jones and Paulhus (2011b), narcissists are motivated by ego-identity goals, whereas psychopaths and Machiavellians strive for material rewards. Moreover, temporal focus of Machiavellians is more long-term oriented than that of psychopaths. Although psychopaths act as predators and function in a fast search-and-prey mode, Machiavellian individuals are more like parasites with long-term goals; they infiltrate, deceive, and exploit on the long run (Jones, 2014). These characteristics of dark individuals are in line with assumptions of Furnham et al. (2013) who suggest that “Machiavellianism and narcissism include facets that lessen the socially undesirable and costly aspects of having a fast life strategy” (p. 206).

Relationship between schizotypal personality and psychopathy, narcissism, and Machiavellianism

Separately each component of the DT has already been investigated in relation with schizotypal personality. Considering psychopathy, results are unambiguous. Schizotypy—especially cognitive-perceptual distortions and disorganization—is
positively related to self-centered impulsivity but negatively with fearless dominance (Ragsdale & Bedwell, 2013; Ragsdale, Mitchell, Cassisi, & Bedwell, 2013). Imaginative personality—the dimensional counterpart of SPD—is positively related to secondary psychopathy, i.e., the psychopathy factor including erratic lifestyle and antisocial behavior (Douglas et al., 2012; Hare, 1991).

With respect to narcissism, positive correlations were found between grandiose narcissistic traits (i.e., overt self-enhancement, denial of vulnerability, entitlement, defensive aggression, and devaluation of others (Dickinson & Pincus, 2003)) and positive schizotypy, whereas vulnerable narcissism (i.e., a subtype of narcissism characterized by grandiose expectations hidden behind the mask of shyness (Dickinson & Pincus, 2003)) was associated with both positive and negative schizotypal traits (Douglas et al., 2012; Miller, Gentile, Wilson, & Campbell, 2013; Wright et al., 2013). However, in studies using the DSM-5 dimensional approach to personality disorders (American Psychiatric Association, 2013), only vulnerable narcissism remained associated with schizotypal traits after controlling for DSM-5 narcissistic personality traits (Miller et al., 2013; Wright et al., 2013).

Considering the relationship between Machiavellianism and the schizophrenia spectrum is rather ambiguous. On one hand, studies by Mazza, De Risio, Tozzi, Roncone, and Casacchia (2003) and Sullivan and Allen (1999) found that people affected by schizophrenia show decreased levels of Machiavellianism compared to healthy controls. On the other hand, studies in normative samples (McHoskey, 2001; Montag et al., 2015) reported positive correlations between Machiavellianism and schizotypal traits—especially interpersonal difficulties and disorganization.

Aims of the Study and Hypotheses

Based on the above reviewed literature, the aim of our study was to reveal specific relationships between schizotypal personality traits and DT traits. Although components of the DT were previously investigated in relation to schizotypal traits, our study can be considered as novel out of two reasons. First, previous investigations (see previous section for a review) studied the relationship between schizotypy and the separated components of the DT (i.e., psychopathy, narcissism, and Machiavellianism). Thus, our study is the first in trying to reveal the relationship between schizotypal traits and the DT as a conceptual composite. Second, our study is the first to support the investigation with a common ecological model, namely that of life history strategies.

Based on the aforementioned literature review, we formulated hypotheses considering each DT trait. Based on their eccentric and reckless nature, we expected psychopathic traits to be related to relatively elevated levels of positive schizotypal traits, i.e., cognitive-perceptual deficits (Hypothesis 1a). Moreover,
psychopathy—characterized by impaired cognitive control—was also expected to be associated with higher levels of disorganization (Hypothesis 1b).

Based on the findings that narcissists try to reach their ego-identity goals through attention and admiration from their social environment (Rhodewalt & Peterson, 2011), we expected an inverse relation between narcissism and negative schizotypal traits, i.e., traits connected to social withdrawal (Hypothesis 2). The strategic or long-term-oriented nature of Machiavellian individuals (Jones & Paulhus, 2011a, 2011b), we expected Machiavellian individuals to be characterized with a cautious and cool-headed way of being. Therefore, we expected Machiavellianism to be inversely related to positive schizotypy and disorganization (Hypothesis 3).

Participants and Procedure

Participants, procedure, and ethical approval

After giving their informed consent, 277 undergraduate students (71.48% females) from the University of Pécs (Hungary) participated in the study. Their average age was 20.64 years (SD = 2.15; min = 18; max = 30). They filled out the questionnaires in small groups ranging from 15 to 30 in size. Participants were recruited from the introductory psychology courses as a convenience sample. Participation was anonymous and voluntary, and participants received no reward in any form. The study was approved by the Regional and Local Research Ethics Committee of the Clinical Centre at the University of Pécs (Approval No. 4598). Only participants with complete data were included in the study. Besides the measures reported in this study, other questionnaires were also filled out by participants with the aim to develop a Hungarian adaptation of the Schizotypal Personality Questionnaire-Brief Revised (Cohen et al., 2010).

Measures

Short DT (SD3; Jones & Paulhus, 2014). SD3 is a 27-item self-report measure of three socially aversive personality traits. The three scales—each with nine items evaluated on a 5-point Likert-scale—measure Machiavellianism (e.g., “Most people can be manipulated”), narcissism (e.g., “I know that I am special because everyone keeps telling me so”), and psychopathy (e.g., “Payback needs to be quick and nasty”). In our study, correlations between Machiavellianism and psychopathy (r = .63; p < .001), between Machiavellianism and narcissism (r = .36; p < .001), and between narcissism and psychopathy (r = .51; p < .001) were of expected direction and strength (for comparison, see Furnham et al., 2013). Internal reliability of all three scales was acceptable (Table 1). SD3 was adapted to Hungarian with the forward–backward translation method and was used in several previous studies (e.g., Birkás & Csathó, 2015; Birkás, Láng,
Schizotypal Personality Questionnaire-Brief Revised. SPQ-BR is a 32-item measure of several different facets of schizotypal personality traits (Cohen et al., 2010). Participants rated items describing characteristics of schizotypal personality on a five-point Likert scale. The questionnaire originally contains seven subordinate scales (i.e., odd/eccentric behavior, odd speech, constricted affect/no close friends, excessive social anxiety, unusual perceptual experiences, magical thinking, and ideas of reference/suspiciousness). In line with the suggested theoretical model (i.e., that of life history strategies), we decided to use three superordinate factors (Callaway et al., 2014; Cohen et al., 2010): (1) Cognitive-perceptual deficits (i.e., positive symptoms—unusual perceptual experiences, magical thinking, ideas of reference/suspiciousness); (2) interpersonal difficulties (i.e., negative symptoms—constricted affect/no close friends and excessive social anxiety); and (3) disorganization (i.e., odd/eccentric behavior, odd speech). Internal consistency was excellent for each factor (Table 1). We were ignorant of any previous study that used SPQ-BR in Hungarian. The Hungarian version was prepared with the forward–backward translation method. According to the results of a confirmatory factor analysis, the model (three interrelated scales) of the Hungarian translation had a satisfactory fit (Hu & Bentler, 1995): $\chi^2 (447) = 746.91$, p < .001; TLI = .90; CFI = .91; RMSEA = .06 (90% CI = .05–.07).

<table>
<thead>
<tr>
<th>Measured Variables</th>
<th>M (SD)</th>
<th>Range</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>Cronbach’s $\alpha$</th>
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<tr>
<td>SD3 scales</td>
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<tr>
<td>Machiavellianism</td>
<td>27.66 (5.85)</td>
<td>9 to 45</td>
<td>-.18</td>
<td>.06</td>
<td>.70</td>
</tr>
<tr>
<td>Psychopathy</td>
<td>20.03 (6.26)</td>
<td>9 to 41</td>
<td>.70</td>
<td>.19</td>
<td>.75</td>
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<tr>
<td>Narcissism</td>
<td>22.85 (5.83)</td>
<td>10 to 39</td>
<td>.07</td>
<td>-.58</td>
<td>.76</td>
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<tr>
<td>SPQ-BR factors</td>
<td></td>
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<td>Cognitive-perceptual deficits</td>
<td>- .98 (.67)</td>
<td>-2.00 to 1.36</td>
<td>1.176</td>
<td>1.094</td>
<td>.86</td>
</tr>
<tr>
<td>Interpersonal difficulties</td>
<td>-.66 (.80)</td>
<td>-2.00 to 1.88</td>
<td>.576</td>
<td>-.063</td>
<td>.89</td>
</tr>
<tr>
<td>Disorganization</td>
<td>-.73 (.89)</td>
<td>-2.00 to 1.50</td>
<td>.612</td>
<td>-.472</td>
<td>.87</td>
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SD3: Short Dark Triad; SPQ-BR: Schizotypal Personality Questionnaire-Brief Revised. Note. SE = .18 and .36 for each variable for skewness and kurtosis, respectively.
Statistical analyses

We used IBM SPSS for Windows 22.0 for statistical analyses. We used multivariate analyses of variance (MANOVAs) to test gender differences on the DT and schizotypal personality variables as two interrelated sets of variables. We used ANOVAs to test gender differences on the specific variables and used Hedges’ gs to demonstrate the effect size. We also used Pearson’s correlations and hierarchical multiple linear regressions to test the relationship between components of the DT and the different factors of schizotypal personality. Hierarchical multiple linear regressions were used to control the effects of gender and the remaining two components of the DT.

Results

Descriptive statistics, characteristics of distributions, and internal reliability indices were computed for all measured variables (Table 1). Skewness and kurtosis for each variable were below |2|, which means that data can be considered to be normally distributed (Gravetter & Wallnau, 2014). Because both DT and schizotypal traits are sex biased (e.g., Jonason, Li, & Buss, 2010; Jonason, Li, Webster, & Schmitt, 2009; Miller & Burns, 1995; Raine, 1992), we used MANOVAs to examine whether there were sex differences on schizotypal personality factors or DT traits. MANOVAs showed a significant sex difference in schizotypal personality factors (Wilk’s $\lambda = .892; F(3, 273) = 11.070; p < .001; \text{partial } \eta^2 = .108$) and a marginally significant sex difference in the DT (Wilk’s $\lambda = .973; F(3, 273) = 2.553; p = .056; \text{partial } \eta^2 = .027$). ANOVAs revealed that each schizotypal personality trait was less characteristic of men than women (Table 2). With respect to DT traits (Table 2), Machiavellianism and psychopathy were found to be more characteristic of men than women. No sex differences emerged with respect to narcissism.

To test the unique relationship of each component of the DT with the factors of schizotypal personality, we used both Pearson’s correlation and multiple linear regressions (Table 3). Correlations revealed that cognitive-perceptual deficits were positively but weakly related to psychopathy and narcissism. Interpersonal difficulties were negatively correlated with narcissism with a moderate strength. Finally, disorganization was positively but weakly related to psychopathy.

After controlling for the effect of sex, the presence of more pronounced psychopathic traits predicted more frequent experience of distorted cognitions and perceptions and more disorganized behavior. Higher levels of Machiavellianism predicted more constricted emotions and interpersonal relationships, whereas more pronounced narcissism predicted less interpersonal difficulties and less self-reported symptoms of disorganization.
Discussion

Because of the limited strength of correlations and the theoretical and actual overlap between the DT traits, we relied only on the results of multiple linear regressions in discussing our results. Both hypotheses regarding psychopathy were supported by the results of our study. Participants who reported higher...
levels of psychopathy also reported higher levels of cognitive-perceptual deficits (Hypothesis 1a) and disorganization (Hypothesis 1B). These results are in line with the findings of previous studies (Douglas et al., 2012; Ragsdale & Bedwell, 2013; Ragsdale et al., 2013) that reported positive relationships between secondary psychopathy and positive and disorganized symptoms of schizotypy.

At the same time, cognitive-perceptual deficits and disorganization can also be considered as contributors to a psychopathic interpersonal strategy. With its relatedness to creativity (Nettle, 2001) and courtship success (Shaner, Miller, & Mintz, 2004), moderate positive schizotypal traits can contribute to the superficial charm of psychopathic individuals (Cleckley, 1941). Moreover, verbal creativity can also enable psychopaths to be successful liars and deceivers (Hare, 1999). However, the potentially disturbing presence of disorganization also restricts the range of strategies that can be successfully applied by individuals who have pronounced psychopathic traits. Lacking adequate emotional and behavioral regulation, individuals with psychopathic traits are impulsive and reckless (Hare, 1999). Their eventual experimenting with long-term strategies might be strongly hindered by disorganization. Therefore, it is a here-and-now-oriented, predator-like strategy that remains a viable option for psychopaths (Jones, 2014). Babiak, Neumann, and Hare (2010) can also be cited in support of this idea. In their study with managers and executives, they found that psychopathy was positively correlated with charisma and creative presentation style, but on the long run, psychopathy was related to worse collegial evaluations.

Our hypothesis considering narcissism (Hypothesis 2) was also confirmed. More narcissistic individuals reported less interpersonal difficulties. Whereas having several friends and expressive emotionality can be part of a grandiose self-perception of narcissistic individuals (Rhodewalt & Peterson, 2011), there are also alternative explanations for the inverse relationship between narcissism and interpersonal difficulties.

In terms of interpersonal features, grandiose narcissism (the construct measured by the Narcissism scale of SD3) was found to be related to dramatic traits with exaggerated emotions and attachment styles reflective of a positive image of the self (Dickinson & Pincus, 2003). While on the long run the interpersonal success of narcissistic individuals can be questioned, at zero acquaintance narcissistic individuals make very good impressions (Back, Schmukle, & Egloff, 2010; Paulhus, 1998). Moreover, at the first glance, people find the same trait valuable in narcissism that becomes the most disliked feature in long-term relationships, i.e., exploitativeness and entitlement (Back et al., 2010). Because entitled and exploitative nature becomes more and more disturbing with time (Back et al., 2010; Paulhus, 1998), narcissistic individuals are not interested in long-term interpersonal relationships. Positive interpersonal feedback from superficial relationships might ensure enough fuel for narcissistic individuals to maintain their sense of grandiosity. This idea is also in line with
the pioneering conceptualization of narcissist’s reactions to real or imagined criticism (Kernberg, 1976). Kernberg (1976) argued that grandiose narcissistic individuals would react in a hostile way, if they felt that they were criticized. This aggressive reaction enables them on one hand to distance themselves from their attackers and on the other hand to protect their vulnerable self. The above-described line of reasoning about the positive but superficial nature of narcissists’ interpersonal relationships gains further support from the evolutionary psychopathology. Negative schizotypal traits can be considered as indicators of a long-term resource allocation strategy (Del Giudice et al., 2010, 2014), thus, we conclude that narcissists are not interested in investigating in relationships on the long run. What they want is rather approval from anyone than commitment from or to a distinguished person.

The hypothesis with respect to Machiavellianism (Hypothesis 3) was disconfirmed. Instead of finding the predicted inverse relationship between Machiavellianism and disorganization and positive symptoms, we found that individuals who reported higher levels of Machiavellianism also reported higher levels of interpersonal difficulties. This finding is supported by several previous findings on Machiavellian individuals’ interpersonal attitudes. Studies have repeatedly found that Machiavellian individuals show dismissing or fearful attachment (Ináncsi, Láng, & Bereczkei, 2015; Jonason, Lyons, & Bethell, 2014), have intense fear of fusion (Láng, 2015), and show restricted expression and understanding of emotions (Szijjarto & Bereczkei, 2015; Wastell & Booth, 2003). All of these characteristics can be a great hindrance in interpersonal relationships.

Although from a clinical point of view, all these features are risk factors for psychological symptoms and ill-being, from an approach addressing adaptive traits, the lack of emotional involvement and closeness in Machiavellian individuals might be an advantageous part of their strategy. Avoidance of close relationships and experiencing deep emotions might enable them to remain cold-blooded even in highly arousing situations (McIlwain, 2003), e.g., when deceiving or when accused of exploitation. This enables Machiavellians to exploit their victims not only occasionally but also on the long run. This result is also in line with the evolutionary approach to negative schizotypal traits as indicators of a long-term resource allocation strategy (Del Giudice et al., 2010, 2014).

Limitations and future directions

Some limitations of the study have to be addressed as well. First, our study was cross-sectional and relied solely on self-reported data from 277 university students. Therefore, we must remain cautious in generalizing our results. Results from the current study are best applied to moderate levels of both schizotypal symptoms and DT traits. Future studies should test the relationship between
schizotypal and DT traits in samples with potentially increased levels of these traits (i.e., clinical or incarcerated samples).

Second, sex differences in our sample were somewhat divergent from those in the existing literature considering both DT traits and schizotypal traits. Whereas the majority of previous studies reported sex differences in all three DT traits (e.g., Jonason, Li, Webster, & Schmitt, 2009; Jonason, Li, & Buss, 2010; but see e.g., Jonason, Valentine, Li, & Harbeson, 2011 as an exception), in our study, men reported only higher levels of Machiavellianism and psychopathy compared to women. On the other hand, women reported more frequent symptoms on all dimensions of schizotypal personality, including positive and negative symptom dimensions. This is only partly in line with previous research (e.g., Miller & Burns, 1995; Raine, 1992), where men tended to report more negative symptoms, while women reported more positive symptoms of schizotypy. These results suggest that our sample could have been atypical in some sense, which would also prevent the generalization of our results. Therefore, future studies with larger sample sizes should test the relation between schizotypal and DT traits separately for men and women. Third, no validity scales were used in this study. This limits confidence in the validity of the measures used, and we can only rely on previous studies (e.g., Cohen et al., 2010; Jones & Paulhus, 2014) that support the ecological validity of these measures.

**Merits and conclusions**

Along with the aforementioned limitations, this study is the first to investigate the relationship between schizotypal symptoms and each of the DT traits in a single study. This design enabled us to detect where do DT traits overlap and what are their unique contribution to schizotypal personality traits. Moreover—and in contrast with previous studies—our study did not only address the superficial similarities between these traits but integrated information in a theoretically meaningful way. Using Life History Theory (Belsky et al., 1991; Kaplan & Gangestad, 2005), and with respect to DT traits as pseudo-pathologies (Jonason et al., 2015), schizotypal symptoms can be considered as ingredients of dark personalities' strategies that are against common good but are still beneficial for the individual in certain contexts.

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