



Psychometric properties of the French-Canadian version of the Dark Triad Dirty Dozen



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ABSTRACT

The Dark Triad is a term used to describe a constellation of undesirable personality traits (i.e., Machiavellianism, narcissism, and psychopathy) that have received considerable empirical attention during the past decade. The Dark Triad Dirty Dozen (DTDD) is a concise instrument developed to assess these traits which has shown good psychometric properties. The aim of this study (N = 394) was to translate and validate a French-Canadian adaptation of the Dirty Dozen (DTDD-FC). The DTDD-FC presented (1) good internal consistency and item properties; (2) a bifactor structure (i.e. items loading on each of their respective trait factor as well as with a global factor); (3) conclusive associations with nomological network surrounding each trait (i.e., convergent and discriminant validity coefficients) and social desirability; and (4) sex differences for psychopathy. Overall, the French-Canadian adaptation of the Dirty Dozen seems to be a valid and psychometrically sound measure of the Dark Triad traits, and is comparable to the original English version.

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1. Introduction

The “Dark Triad” is a term used to describe a cluster of undesirable personality traits found in clinical and subclinical populations (Paulhus & Williams, 2002). It is composed of three independent but related constructs sharing common socially malevolent character, phenotypical behaviors (e.g., manipulation, self-promotion), and conceptual similarities: Machiavellianism, psychopathy, and narcissism. Machiavellianism refers to ingenious, selfish, and manipulative people using deceitful strategies to pursue their goals. Psychopathy is characterized by selfishness, impulsivity, lack of remorse or empathy, shallowness, manipulateness, and callousness. Narcissistic people constantly search for attention and admiration, considering themselves as superior to others, often acting cruelly and without empathy. A growing body of literature documents the numerous impacts, mostly deleterious, of these traits in various areas of life for the person, but also for relatives and the entourage. For example, the Dark Triad traits were associated with cheating behaviors and plagiarism in educational environments (Nathanson, Paulhus, & Williams, 2006), with toxic leadership and

poor management skills in workplaces (O’Boyle, Forsyth, Banks, & McDaniel, 2012), and with marital dissatisfaction in mating context (Savard, Sabourin, & Lussier, 2011).

Initially, the Dark Triad dimensions were individually assessed by different instruments such as the Mach IV (Christie & Geis, 1970), the Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979), or the Self-Reported Psychopathy (SRP-II; Hare, Harpur, & Hemphill, 1989). However, this strategy multiplies response biases and is time-consuming. For these reasons, Jonason and Webster (2010) proposed a concise measure to assess the three core components of Dark Triad into a single instrument, the Dark Triad Dirty Dozen (DTDD), which is composed of 12 items, four for each Dark Triad trait.

Research supports the adequacy of the psychometric properties of the DTDD, including internal consistency, test-retest, and factor structure (Jonason, Kaufman, Webster, & Geher, 2013; Jonason & Luévano, 2013; Jonason & McCain, 2012; Jonason & Webster, 2010; Miller et al., 2012). Item response theory analyses showed that across samples, items discriminate adequately among people along their respective latent traits (Webster & Jonason, 2013). In addition, men systematically score higher than women do on Machiavellianism, narcissism, and especially, psychopathy (Carter, Campbell, Muncer, & Carter, 2015; Jonason & Webster, 2010). Various confirmatory factor analyses explored the latent structure of the DTDD, and the best fit was found for the bifactor model (Jonason & Luévano, 2013; Jonason et al., 2013; McLarnon & Tarraf, 2017). In this model, items load on both their

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respective dimension and a general factor, Dark Triad. Convergent validity of the DTDD was supported using a variety of validated instruments specifically assessing Machiavellianism, psychopathy, and narcissism (Jonason & Webster, 2010; Maples, Lamkin, & Miller, 2014), and with low rates of honesty/humility, conscientiousness, and agreeableness, and high rates of aggression and self-esteem (Jonason & McCain, 2012; Jonason & Webster, 2010; Jonason et al., 2013). Despite the presence of transparent items, no study focused on a possible influence of socially desirable responding to our knowledge. The English version was adapted in other languages, including Chinese (Yao-Guo, Qun-bo, Jing-Yi, Yuan-Zheng, & Xiao-Hong, 2015) and German (Küfner, Dufner, & Back, 2015), but most of these studies presented complementary but fragmented psychometric analyses. Because only few instruments assessing psychopathy or the Dark Triad traits are available in French and because it is a psychometrically sound and useful instrument, the present study aims at validating the French-Canadian version of the DTDD (i.e., DTDD-FC).

The traditional procedure of back-translation was used (Van De Vijver, 2016), after which analyses were performed, pertaining to (1) internal consistency and item properties (i.e., using classical test theory and item response theory); (2) the factor structure; (3) nomological assessments; and (4) differences between men and women. We predicted higher correlations between items within the same dimension, coinciding with high internal consistency coefficients for the dimensions and on the whole. We also hypothesized that items should discriminate at different levels of Dark Triad traits. According to previous results noted above, a bifactor structure is expected, showing items loading on the three underlying inter-correlated specific constructs and on a higher-order Dark Triad construct (Jonason & Luévano, 2013; McLarnon & Tarraf, 2017).

We also predicted that Machiavellianism, psychopathy, and narcissism should be associated with primary psychopathy (i.e., grandiosity, shallowness, manipulateness, lack of remorse, low anxiety) and with low agreeableness, considering the insensitive, cold, and manipulative nature of psychopaths. Machiavellianism and psychopathy should be positively correlated with secondary psychopathy (i.e., antisocial behaviors, impulsiveness, irresponsibility, etc.) and negatively with conscientiousness because of the impulsivity and lack of self-reflection implicitly measured by these subscales (Jonason et al., 2013). Researchers have reported that narcissists are self-absorbed and overly sensitive, emotionally labile, extraverted and self-enhancing, but crave admiration from others (Rogoza, Wyszynska, Mačkiewicz, & Ciecuch, 2016). In this context, we predicted that narcissism should be positively correlated with extraversion and emotional instability (i.e., neuroticism). In general, associations between an instrument and social desirability are unwelcome, but because the DTDD items are transparent and should activate the manipulative tendencies inherent to these personality traits, positive associations with impression management might be observed. The sense of grandiosity and the internalization of positive reports of one's self, associated with the Dark Triad, led us to predict that the DTDD-FC scale, especially narcissism, should be positively associated with self-deception. As for sex differences, evolutionary psychologists argued that Dark Triad traits are part of an adaptive suite of individual differences that facilitate short-term mating in men, in particular (Jonason, Li, Webster, & Schmitt, 2009). It was also suggested that there are systematic differences on personality traits for men and women (Costa, Terracciano, & McCrae, 2001), especially in the darker aspects of human nature (Carter et al., 2015; Jonason et al., 2009). In consequence, we hypothesized that men should score higher on Machiavellianism, psychopathy (especially), and narcissism.

2. Method

2.1. Participants and procedure

A sample of 394 (319 women) French-Canadian university students aged from 18 to 67 years old ($M = 26.75$; $SD = 7.83$) participated

voluntarily. Most of the participants were bachelor degree students (62%), with a few master degree students (24.3%) and doctorate students (11.6%). More than half were also employed (59%), and worked 19 hours per week, on average. Ninety-five percent used French-Canadian as their first language.

Participants were recruited via an institutional e-mail, leading to an online survey including a consent form. Data was collected anonymously and computerized via the Limesurvey online platform. No compensation or incentive was offered for their participation. Participants were informed that we were validating a personality questionnaire (hence, undesirable personality traits were not mentioned to minimize biases). This study was approved by the university ethics committee.

2.2. Translation procedure of the DTDD

Preliminary translation of the scale from English to French-Canadian was made by two of the authors, who are fully bilingual, ensuring to use standard French and avoiding lexically specific French-Canadian items or expressions and words that could be semantically different. Four experts in the field of personality (three university professors and one psychologist) were asked: to evaluate if each item was representative of its underlying construct (i.e., Machiavellianism, psychopathy, narcissism); to judge if the French-Canadian version of each item was equivalent to the original English version; and to give their comments or suggestions about each item (clarity, relevance, etc.). The preliminary French-Canadian-version was also submitted to a university student to verify the intelligibility of each item. This process resulted in minor linguistic corrections. A back-translation procedure was then performed by an English native who was a qualified translator, without prior access to the original scale. The main author compared the two versions and determined that there were no discrepancies in their content.

2.3. Measures

In addition to the DTDD, the French-Canadian adaptation of the Levenson Self-Report Psychopathy Scale (LSRP; Savard, Lussier, & Sabourin, 2014) was used. It is a 26-item questionnaire with a four-point Likert scale (1 = *Totally disagree*; 4 = *Totally agree*), designed to assess psychopathic features in community samples. Items scores were averaged to obtain primary (Cronbach's $\alpha = .77$) and secondary psychopathy ($\alpha = .69$) indexes. The Primary Psychopathy scale evaluates selfish, manipulative, and malevolent attitudes towards others. The Secondary Psychopathy scale contains items related to an impulsive and self-defeating lifestyle.

Big Five personality traits were measured with the French-Canadian adaptation of the NEO-FFI (Sabourin & Lussier, 1992). The 60 items assessing neuroticism ($\alpha = .85$), extraversion ($\alpha = .76$), agreeableness ($\alpha = .67$), openness ($\alpha = .68$), and conscientiousness ($\alpha = .80$) are answered using a five-point Likert scale (0 = *Totally disagree*; 4 = *Totally agree*). Items were averaged in order to compute each dimension score.

A brief (21 items) and adapted French-Canadian version of the Balanced Inventory for Desirable Responding (BIDR; D'Amours-Raymond, 2011) was used to assess self-deception and impression management on a seven-point Likert scale (1 = *Totally false*; 7 = *Totally true*). We used the recode procedure proposed by Paulhus (1984) in order to dichotomize items. Because dichotomization does not consider the possibility that items bear different levels of endorsement and because polytomous scores yield better psychometric properties (Vispoel & Kim, 2014), current analyses were also done by averaging item scores for the two scales. Cronbach's alphas for the Self-Deceptive Enhancement and for the Impression Management scales were respectively .59 and .70 (if scored dichotomously, KR-20 = .50 and .62, respectively).

Table 1
Descriptive statistics, sex differences, internal consistency, discrimination and difficulty parameters for the Canadian-French version of the Dark Triad Dirty Dozen items with classical test theory and item response theory, and inter-item correlations (N = 362–391)

	Classical test theory			Item response theory								Inter-item correlations			
	M	SD	ISC	a	b ₁	b ₂	b ₃	b ₄	b ₅	b ₆	b ₇	b ₈			
Machiavellianism ($\alpha = .82, M = 2.84, SD = 1.62, t_{sex} (391) = 1.95, p = .08, \text{Hedges' } g = 0.28$)													2	3	4
1	3.15	2.11	.66	2.48	−0.65	−0.28	0.23	0.53	0.79	1.34	2.27	2.91	.53	.50	.56
2	2.48	1.93	.65	2.18	−0.27	0.13	0.73	1.05	1.31	1.70	2.26	2.97		.50	.58
3	3.75	2.25	.62	1.85	−1.00	−0.72	−0.23	0.17	0.54	1.14	2.08	2.80			.51
4	2.00	1.66	.68	2.90	0.22	0.55	1.02	1.28	1.59	2.04	2.51	2.89			
Psychopathy ($\alpha = .72, M = 2.55, SD = 1.55, t_{sex} (389) = 3.74, p < .01, \text{Hedges' } g = 0.54$)													6	7	8
5	2.47	2.14	.47	1.41	−0.04	0.31	0.86	1.19	1.58	2.02	2.40	2.94	.38	.45	.24
6	1.79	1.58	.56	2.05	0.47	0.79	1.33	1.66	1.95	2.16	2.49	2.97		.55	.30
7	2.45	2.00	.64	2.64	−0.07	0.16	0.59	0.91	1.24	1.67	2.12	2.67			.42
8	3.30	2.36	.43	1.24	−0.76	−0.38	0.20	0.55	0.93	1.62	2.40	2.98			
Narcissism ($\alpha = .84, M = 4.31, SD = 1.80, t_{sex} (390) = -1.22, p = .20, \text{Hedges' } g = -0.16$)													10	11	12
9	5.03	2.23	.75	3.81	−1.65	−1.34	−0.83	−0.48	−0.16	0.36	0.95	1.46	.77	.62	.47
10	4.80	2.16	.71	2.96	−1.61	−1.33	−0.84	−0.45	−0.06	0.49	1.19	1.86		.54	.46
11	4.65	2.38	.66	1.90	−1.44	−1.16	−0.67	−0.34	−0.01	0.51	1.27	2.13			.51
12	2.77	2.06	.55	1.36	−0.44	−0.08	0.50	0.93	1.42	2.03	2.73	3.81			

Note. ISC = Item-scale correlations (corrected). A nine-point Likert scale (1 = *Totally disagree*; 9 = *Totally agree*) was used; a = discrimination parameters; b = Item difficulty parameters.

3. Results

Item analysis (see Table 1) indicated that items from a same subscale strongly correlate with each other (except item 8 that showed only moderate correlations with other items of the Psychopathy subscale). Internal consistency was good for the whole scale ($\alpha = .83$), as well for the subscales ($\alpha = .72$ to $.84$). Discrimination parameters in classical test theory are satisfactory (i.e., corrected item-scale correlations) as well as in item response theory (i.e., parameter *a*). Item difficulty parameters (*b*), estimated with libirt (version 1.3; Germain, Valois, & Abdous, 2011), are distributed at different levels along the true score distribution, hence items are complementary in discriminating levels of Dark Triad traits.

Exploratory factor analysis¹ (performed with IBM SPSS version 23) with oblique rotation (promax) revealed three correlated dimensions with items loading on their expected factor with coefficients from .42 to .92 (see Table 2). Prior to rotation, Machiavellianism, psychopathy, and narcissism accounted respectively for 14.45%, 5.51%, and 32.57% of variance. As expected and previously demonstrated (Jonason & Luévano, 2013; Jonason et al., 2013), confirmatory factor analyses (performed with Mplus 6.12; Fig. 1) revealed that these dimensions are best described by a corrected bifactor model² (see Fig. 1; $\chi^2/df = 2.25$, CFI = .96, TLI = .94, RMSEA = .06, 90% CI = [.04, .07]; BIC = 18553.72; see Reise, Morizot, & Hays, 2007), compared to a three-correlated-factors model or a hierarchical model ($\chi^2/df = 2.92$, CFI = .93, TLI = .91, RMSEA = .07, 90% CI = [.06, .08]; BIC = 18577.63), with $\Delta\chi^2(9) = 43.09, p < .01$. Machiavellianism items (items 1–3) loaded more on the global Dark Triad factor than on the Machiavellianism factor, while item 4 loaded only on the global Dark Triad factor.

Convergent validity was seen through positive correlations with primary and secondary psychopathy, as measured with the LSRP (Table 3), and through negative correlations with agreeableness and conscientiousness. The positive association between narcissism and neuroticism was confirmed, but not the one with extraversion. Discriminant validity was observed in psychopathy's low negative correlation with extraversion and in the absence of correlations between the three dimensions and self-deceptive enhancement and openness. Contrary to

¹ Note that common factor analysis was preferred to principal component analysis because it considers both common variance and measurement error, and is more generalizable to confirmatory factor analysis (Floyd & Widaman, 1995). Therefore more suited for replicating the structure of an existing scale.

² The bifactor model could not converge without optimization. During optimization, item 4 did not significantly load on the Machiavellianism factor, only on the Dark Triad factor.

expectations, DDTD-FC subscales were negatively correlated with Impression Management. To control for the shared variance among the Dark Triad traits, multivariate regression using path analysis was performed (see Fig. 2). Machiavellianism and psychopathy were distinctly associated with Agreeableness and Conscientiousness (negatively), and with primary and secondary psychopathy, but not narcissism.

And last, men (compared to women) scored higher on psychopathy ($M = 3.24, SD = 1.81$ for men versus $M = 2.40, SD = 1.44$ for women) and marginally higher on Machiavellianism ($M = 3.22, SD = 1.91$ for men versus $M = 2.76, SD = 1.53$ for women), with respectively medium and small effect sizes (see Table 1). No sex difference was detected for narcissism ($M = 4.08, SD = 1.86$ for men and $M = 4.37, SD = 1.78$ for women).

4. Discussion

The main objective of the study was to propose and validate a French-Canadian version of the Dark Triad Dirty Dozen (DTDD-FC) that is comparable to the original English version (Jonason & Webster, 2010), and subsequently remedies the lack of French-language questionnaires measuring the Dark Triad traits. Therefore, information was collected about internal consistency and item parameters, factor structure, convergent and discriminant validity, and differences between women and men.

First, internal consistency coefficients were quite similar to the original English version (Jonason & Webster, 2010) and items discriminate well along different endorsement levels, suggesting they are relevant and complementary. The moderate correlations obtained between item 8 and other items of the psychopathy subscale could be explained by differential understanding of the meaning of the word “cynical”, also previously identified as ambiguous by Jonason and Luévano (2013). In this context, the replacement of item 8 by one found in the adolescent version developed by Muris, Meesters, and Timmermans (2013); “*I am cynical and mocking towards others*” should be considered in further studies. However, such an item might be “double-barreled” in nature, which can be problematic. On the other hand, inter-item correlation between item 9 and 10 was higher than what is generally recommended (Boyle, 2016). This could suggest a semantic overlap in the content of each item, which may be a good thing on condition that validity is also supported, which is the case with the DTDD-FC (Boyle, 2016). However, it mostly reflects that participants did not distinguish between “being admired” by others and “having others’ attention”. Reformulation of one of these items could improve the instrument's psychometric qualities, and should be supported by a readability analysis.

Table 2
Factor loadings, communalities (h^2) and inter-factor correlations from exploratory factor analysis of the Canadian-French version of the Dark Triad Dirty Dozen

Items	Factor pattern matrix coefficients			h^2
	Machiavellianism	Psychopathy	Narcissism	
1. J'ai tendance à manipuler les gens pour avoir ce que je veux (I tend to manipulate others to get my way)	.69	.00	.06	.51
2. J'ai utilisé la tromperie et le mensonge pour parvenir à mes fins (I have used deceit or lied to get my way)	.70	.09	-.05	.54
3. J'ai utilisé la flatterie pour obtenir ce que je voulais (I have use flattery to get my way)	.74	-.11	.04	.49
4. J'ai tendance à exploiter les autres pour atteindre mes objectifs (I tend to exploit others towards my own end)	.69	.21	-.04	.66
5. J'ai tendance à éprouver peu de remords (I tend to lack remorse)	.13	.49	-.08	.31
6. J'ai tendance à ne pas trop accorder d'attention à la moralité de mes actions (I tend to be unconcerned with the morality of my actions)	-.01	.69	-.01	.46
7. J'ai tendance à être dur et insensible (I tend to be callous or insensitive)	-.09	.87	.03	.68
8. J'ai tendance à être cynique (I tend to be cynical)	.07	.43	.10	.25
9. Je suis porté(e) à rechercher l'admiration des autres (I tend to want others to admire me)	-.10	.06	.92	.80
10. J'ai tendance à vouloir que les autres m'accordent de l'attention (I tend to want others to pay attention to me)	-.03	-.05	.84	.68
11. J'ai tendance à rechercher le prestige et un statut particulier (I tend to seek prestige or status)	.07	.04	.68	.51
12. J'ai tendance à attendre des traitements de faveur de la part des autres (I tend to expect special favors from others)	.33	-.06	.46	.42
Inter-factor correlations				
Machiavellianism		.58**	.42*	
Psychopathy			.17*	

Note. Original items are in italics. The oblique rotation method was Promax with Kaiser normalization. The extraction method was Principal Axis Factoring. The boldfaced loadings correspond to the expected structure.

* $p < .01$.
** $p < .001$.

The three-factor structure was clearly reproduced both in exploratory and confirmatory factor analyses. Even if the three-correlated-factor structure showed acceptable goodness-of-fit coefficients, a bifactorial model better fits the data. This supports previous studies that Dark Triad responses reflecting the combined influence of the specific factors of Machiavellianism, psychopathy, and narcissism, and the presence of an overarching global factor, which may represent underlying malevolent tendencies (Jonason & Luévano, 2013; McLarnon & Tarraf, 2017; O'Boyle et al., 2012). However, item 4 (i.e., *I tend to exploit others towards*

my own end) did not load on Machiavellianism, suggesting that it is more related to a common factor and less to the items in its dimension. Therefore, the exploitative lifestyle depicted in item 4 may be too abstract (examples of behaviors could be useful to clarify the item) or represents a core characteristic of shared variance of the Dark Triad traits. Indeed, exploitative tendencies should be observed in each specific trait, but in different ways, or might occur for different reasons. The other Machiavellianism items also loaded more on the common factor than on their respective trait factor. Interpersonal attitudes described

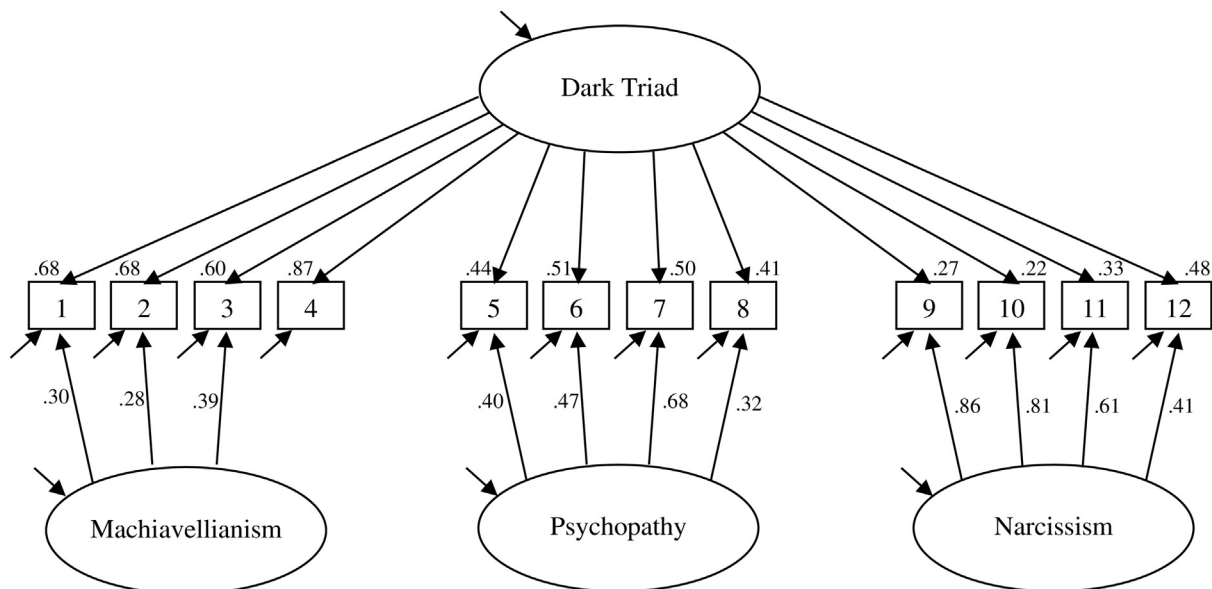


Fig. 1. Bifactor confirmatory factor analysis for the Canadian-French version of the Dark Triad Dirty Dozen with standardized loadings ($p < .01$).

Table 3

Bivariate correlations of Canadian-French version of the Dark Triad Dirty Dozen global score and subscales (Machiavellianism, psychopathy, and narcissism) with subscales of the LSRP, the NEO-FFI, and the BIDR.

	DTDD-FC subscales			
	Machiavellianism	Psychopathy	Narcissism	Dirty Dozen
LSRP				
Primary psychopathy	.53*	.48*	.24*	.54*
Secondary psychopathy	.26*	.30*	.20*	.37*
NEO-FFI				
Neuroticism	.10	.08	.30*	.22*
Extraversion	-.01	-.18*	.07	-.05
Openness	.01	.02	-.02	-.01
Agreeableness	-.46*	-.43*	-.21*	-.49*
Conscientiousness	-.17*	-.20*	-.07	-.19*
BIDR ^a				
Self-Deception scale	-.06	.08	-.08	-.02
Impression management	-.39*	-.22*	-.14*	-.33*

Note. LSRP = Levenson Self-Reported Psychopathy Scale; BIDR = Balanced Inventory for Desirable Responding.

^a Both scoring methods of the BIDR (dichotomized and scale) yielded comparable correlations with DTDD-FC scales. Therefore, we only reported correlations obtained with the dichotomized scoring procedure.

* $p < .001$.

in the Machiavellianism items strongly describe relational tendencies also found in theoretical definitions of psychopathy and narcissism, hence might lack specificity. These results faithfully reproduced those obtained in the original English version and subsequent further tests (Jonason & Luévano, 2013; Jonason & Webster, 2010; Jonason et al., 2013).

Convergent validity analyses results support the insensitive, manipulative, and selfish attributes assigned to the Dark Triad by the negative associations with agreeableness and conscientiousness, and the positive links with neuroticism and psychopathy. The Dark Triad traits, as assessed by the DTDD-FC, seem to constitute the indicators of a unified construct similar to the metatrait *Stability*, comprising the shared variance of agreeableness, neuroticism (reversed), and conscientiousness, those traits covarying with each other. It describes individuals with volatility, limited compassion and politeness, and low rates of industriousness and orderliness (Jonason et al., 2013). Interesting distinctions can also be made on three NEO-FFI factors (i.e., Neuroticism, Extraversion, and Conscientiousness). Indeed, Machiavellianism and psychopathy traits are both associated with disorderly, lack reliability, and low self-control but not narcissism as previously observed (Jonason & Tost, 2010). Moreover, people with high psychopathic traits are often introverted and independent, as well as less likely to appreciate large groups (low score on extraversion) as previously observed (Jonason et al., 2013). Narcissistic traits were associated with heightened emotional instability and distress, supporting the self-absorbed, overly sensitive, and emotionally labile characteristics described in literature (Rogoza et al., 2016). Narcissism was not correlated with extraversion, which is consistent with prior work suggesting that the DTDD narcissism subscale taps vulnerable narcissism (Maples et al., 2014; Miller & Maples, 2011).

The DTDD-FC seems to be moderately negatively associated with impression management, contrary to predictions, suggesting that people endorsing Dark Triad traits act in an ego-syntonic way as though they do not value social acceptance and do not try to hide their genuine personality. As some authors noted, the inverse relation between the Dark Triad traits and social desirability, especially impression management, simply reflects the true nature of undesirable personality traits (Verschuere et al., 2014). The anonymous nature of the data collection could also have encouraged participants to endorse Dark Triad traits. None of the scales were associated with self-deceptive enhancement. This suggests that people characterized by high levels of the traits do

not deceive themselves about who they really are, and do not care if others see them as they are (i.e., they are egosyntonic traits). To our knowledge, this is the first study to analyze self-deceptive enhancement and impression management with the DTDD.

Women's scores on Psychopathy subscale were lower than men's were. The difference between sex groups on those traits is well-documented (Carter et al., 2015; Jonason & Webster, 2010; Yao-Guo et al., 2015). The main explanation is that Dark Triad traits represent male-typical social and sexual strategies (Carter et al., 2015; Jonason & Webster, 2012; Jonason et al., 2009). This difference might also be attributable to different manifestations of Dark Triad traits between sex groups as proposed by previous authors (Jonason & Webster, 2012; Verona, Bresin, & Patrick, 2013). For example, manipulative women (with high Machiavellianism and psychopathy) might be more likely to be flirtatious, whereas men are more likely to engage in cunning behaviors. Also, conduct disorders and impulsivity associated to psychopathy in women are more characterized by running away, self-harm, manipulation, and complicity in crimes, whereas men are most likely to be aggressive and violent. More work is needed to determine the mediating and moderating factors of the relationships between the Dark Triad traits and behaviors in men and women.

4.1. Limitations

Regardless of the strong psychometric similarities with the original version, we urge bearing in mind some limitations. First, we did not recruit an equal sex ratio of participants in our sample to compute structural invariance analyses, which could have helped to clarify if the differences between men and women's mean scores are caused by differential item functioning (Raju, Laffitte, & Byrne, 2002). Prior work, albeit exploratory in nature, has obtained different factor solutions for men and women (Carter et al., 2015), where the original three-factor solution replicated in women, but a two-factor structure (Machiavellianism-psychopathy altogether, and narcissism separated) emerged for men. The merging of Machiavellianism and psychopathy items into the same factor could explain why Machiavellianism items better fit with the higher-order, global Dark Triad factor rather than the subscales in CFA. Further study on DTDD-FC should include exploratory and confirmatory factor analyses, separately for women and men, with larger samples.

Second, the sample used for this study was only composed of university students. This step was indispensable to truly compare the French version with the original English version, which was also validated with students, but it still restricts the generalization of results. Different response patterns might be observed in more heterogeneous samples. In addition, the voluntary nature of the study, offering no rewards, could have biased the sample. Such participants may possess a greater degree of altruism compared to what is found in average student populations who receive course credit for their participation, and consequently, a lower degree of Dark Triad.

Third, the cross-sectional design of the study does not allow the examination of the instrument's stability, nor if any change occurred in the factor structure over time. The use of prospective, longitudinal designs in future studies, using test-retest reliability estimates, would be helpful to fill these gaps. A considerable addition to convergent validity would be to correlate the DTDD-FC scales with well-validated French-Canadian measures assessing specifically Machiavellianism and narcissism.

Because the development of the DTDD-FC was based on a rigorous back-translation procedure using standard French, we are confident about the instrument's generalizability in various French-speaking communities. However, a careful approach would be to pretest items for comparability and interpretability before using it in another French culture.

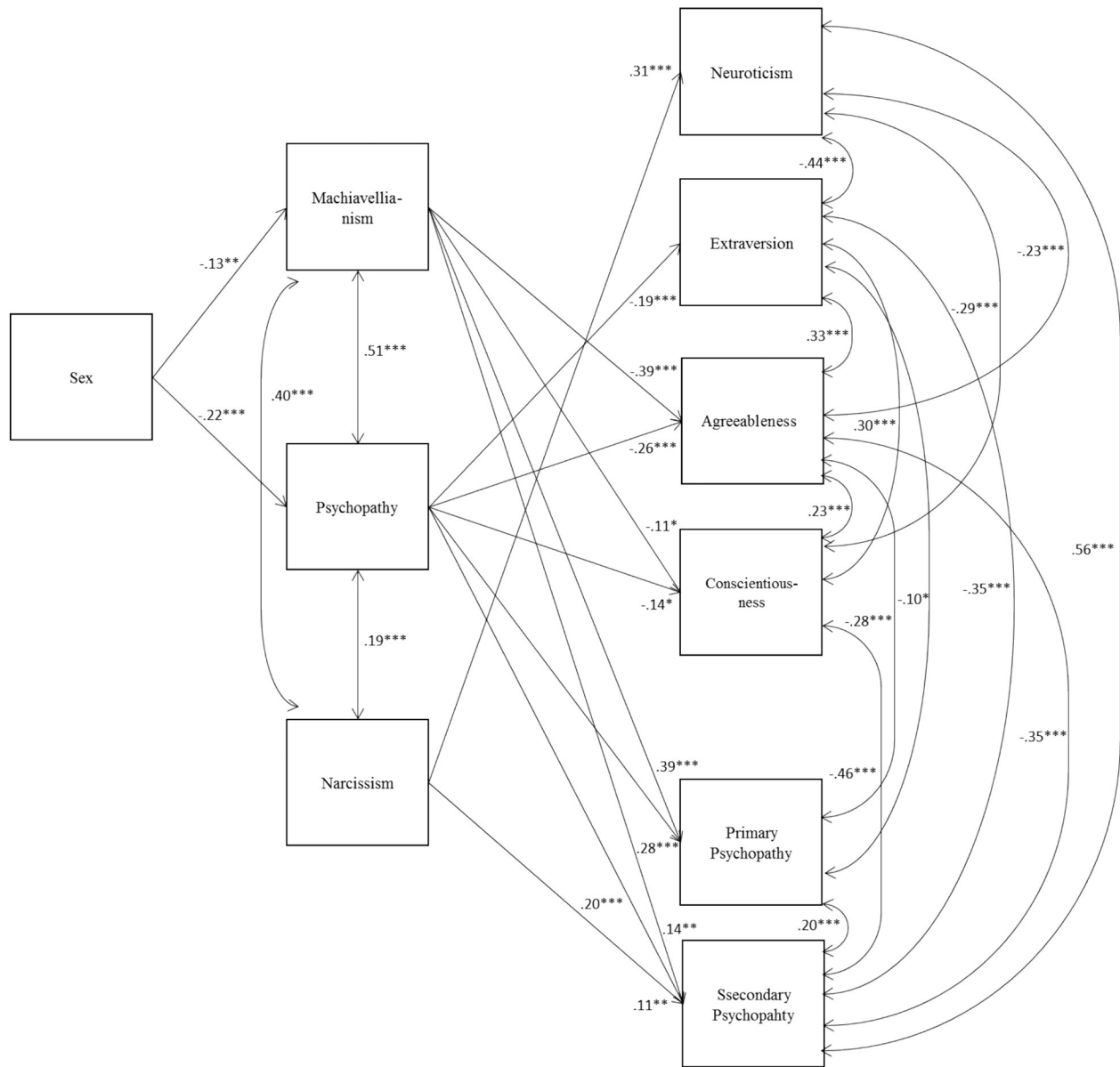


Fig. 2. Multivariate regression performed with path analysis in structural equation modeling to determine associations between Canadian-French version of the Dark Triad Dirty Dozen subscales (Machiavellianism, psychopathy, and narcissism), the NEO-FFI, and the Levenson Self-Reported Psychopathy subscales, controlling for sex (registered as a dichotomous variable; men = 0, women = 1) and age. Because age and openness were not associated with Dark Triad, they were not included in the final model. Fit indexes: CFI = .992, NNFI = .978, SRMR = .030, RMSEA = .037, 95% [.000, .068]. * $p < .05$. ** $p < .01$. *** $p < .001$.

5. Conclusion

Despite the aforementioned limitations, our findings offer evidence that the French-Canadian Dirty Dozen version assesses the Dark Triad personality traits with adequate psychometric properties. It performs similarly to the original English version, with its strengths and limitations. The availability of a reliable, brief, and valid measure of Machiavellianism, psychopathy, and narcissism can contribute to cross-cultural research in the growing literature on pathological personality traits in the general population, and fill the absence of this type of instrument in French-speaking communities (including Canada, France, and Belgium). Keeping in mind that the DTDD-FC is a brief measure, hence does not capture the entire construct of Dark Triad traits (Maples et al., 2014), it still seems to be an interesting and concise instrument that can be included in larger assessment batteries for the screening of undesirable personality traits in non-clinical samples, to pursue both research and clinical goals.

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