


# The Facilitative Effect of Impulsiveness on the Dark Triad and Social Network Sites Addiction: The Dark Triad, Impulsiveness, SNS Addiction

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## ABSTRACT

This research investigated the relationships of the Dark Triad, impulsiveness, and social network site (SNS) addiction with adolescents. In particular, this research examined the indirect effects of the measured motor, attentional and nonplanning impulsiveness on the relationship of the Dark Triad and SNS addiction. To examine the possible antecedents of SNS addiction, 169 adolescents aged 14-17 were recruited for this research. After obtaining informed consents from their legal guardians, these adolescents completed the Dirty Dozen, the modified Bergen Facebook Addiction Scale, and the Barratt Impulsiveness Scale – version 11. Results showed that the Dark Triad composite score was positively correlated with SNS addiction and the different aspects of impulsiveness, while SNS addiction was positively correlated with motor impulsiveness. The indirect effect of motor impulsiveness on the relationship of the Dark Triad and SNS addiction was significant. The present findings provide theoretical insights to the development of SNS addiction.

## KEYWORDS

Adolescents, Dark Triad, Impulsiveness, SNS Addiction

## INTRODUCTION

Social network sites (SNS) addiction is a research area with extensive research due to its implications on various domains of functioning, such as users' psychological well-being (e.g. Lee et al., 2015). The ubiquitous SNS have attracted users from different age group, including those from younger age such as adolescents, due to rapid development of communication technology (Sampasa-Kanyinga & Lewis, 2015). Due to the vulnerability of this age group, research has extensively examine the impact of these ubiquitous online platforms on adolescents. Empirical findings revealed that users from this age group are vulnerable to SNS addiction (Błachnio & Przepiorka, 2016a; Błachnio et al., 2015; Jafarkarimi et al., 2016), and that adolescents are more likely to develop SNS addiction than

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young adults (Jafarkarimi et al., 2016). Consequently, risk factors of SNS addiction amongst young users have been important scopes for empirical research. The vast literature implies that personality traits are common indicators of SNS usages (e.g. Ross et al., 2009), including vulnerability to SNS addiction (e.g. Błachnio & Przepiorka, 2016a). In this light, this research focuses on the relationship of personality and SNS addiction, with adolescents as the sample.

Despite the vulnerability of adolescents, empirical research mainly focused on young adults (e.g. Andreassen et al., 2012) due to their availability as research participants. Thus, the present research addressed this gap by examining the significance of personality traits in predicting SNS addiction with adolescents. Specifically, this study focused on the significance of the Dark Triad in predicting SNS addiction since these traits are indicative of vulnerability to problematic use of SNS (Kircaburun et al., 2018) and SNS addiction (Chung et al., 2019, Lee, 2019), and possessed more predictive power than the conventional Five-Factor Model (Lee, 2019). The present study also posited the indirect effect impulsiveness on the relationship of the Dark Triad and SNS addiction among adolescents.

## Personality Traits and SNS

Research on the influences of personality traits on the development of SNS usages and their problematic aspects remain significant since these findings are highly applicable to identify individuals who are vulnerable to heavy use of SNS (Amichai-Hamburger & Vinitzky, 2010). Despite the significance of the Five-Factor model, the small effect size accounted by these broad five domains implicate for their limited influence on SNS usage, pressing for investigation with other personality traits (Ross et al., 2009; Skues et al., 2012). Consequently, investigations have extended into subclinical traits such as narcissism (Andreassen et al., 2017; Casale et al., 2016), which significantly explained more variance of SNS addiction than the conventional Five-Factor model (e.g. Lee, 2019). From this line of research, there was a strong conceptual link of SNS addiction and impulsiveness, since this form of addiction was described as an irresistible urge (Hoffman et al., 2012). Subsequent empirical investigations have supported the conceptual link of impulsiveness and SNS addiction (Błachnio & Przepiorka, 2016b; Cudo et al., 2019; Delaney et al., 2018; Rothen et al., 2018; Turel & Qahri-Saremi, 2018; Wu et al., 2013). In light of this, highly impulsive individuals are prone to unrestraint use of SNS. Although significant results were found, the weak effect sizes accounted by these subclinical traits suggested that there are unaccounted traits with more influence. In the vast efforts to elaborate the conceptual links of personality traits and SNS usages, the influence of the Dark Triad has been widely investigated. Findings have supported that the Dark Triad accounted for additional variance above the Five-Factor model in predicting human values (Kajonius et al., 2015), social outcomes such as prejudice (Hodson et al., 2009; Koehn et al., 2019) and perceived attractiveness (Carter et al., 2014), and SNS addiction (Lee, 2019). These findings indicated that the Dark Triad traits exert greater influence on social behaviours over the Five-Factor model, highlighting the importance of these traits in addressing the limited influence of personality traits in predicting SNS usages (Ross et al., 2009; Skues et al., 2012).

## The Effect of the Dark Triad in Social Media Context

The Dark Triad consists of three socially aversive traits known as psychopathy, narcissism, and Machiavellianism (Paulhus & Williams, 2002). Psychopathy refers to the lack of empathy, callousness, and erratic behaviours (Hare, 2003). Narcissism refers to a sense of entitlement, dominance, and a grandiose self-view (Raskin & Terry, 1988). Machiavellianism indicates the tendency to manipulate others for own benefit (Christie & Geis, 1970). Findings from extensive research revealed several social implications of these three aversive traits. Conceptually, individuals with salient dark features are highly impulsive (Crysel et al., 2013; Jones & Paulhus, 2011; Jonason & Tost, 2010; Malesza & Ostaszewski, 2016), which rendered their susceptibility to high-risk behaviours (Jones, 2014), and their aggressiveness and hostility towards others (Baughman et al., 2012; Pailing et al., 2014). Despite the aversive outcomes, individuals with salient dark traits are highly competent in social interaction

(Jonason & Webster, 2012), allowing them to exploit their social contacts (Jonason & Schmitt, 2012; Jones, 2013), including to obtain short-term sexual gratification (Jonason et al., 2010; Jonason et al., 2009; Jonason et al., 2012; Jonason, et al., 2011). To widen their connection to gratify their needs, individuals with salient dark traits tend to exploit features on SNS. Evidences supported that these individuals tend to exploit self-promotional features on SNS such as selfie (Fox & Rooney, 2015) to gratify their grandiosity. Additionally, individuals with high dark traits utilize SNS to identify prospective short-term relationships (Timmermans et al., 2018), and to inflict aggression on others by humiliating and insulting their peers online (Bogolyubova et al., 2018; March et al., 2017; Pabian et al., 2015). The reviewed findings clearly indicate the potential impact of dark traits on SNS addiction, where individuals with salient dark traits are highly dependent on these online platforms.

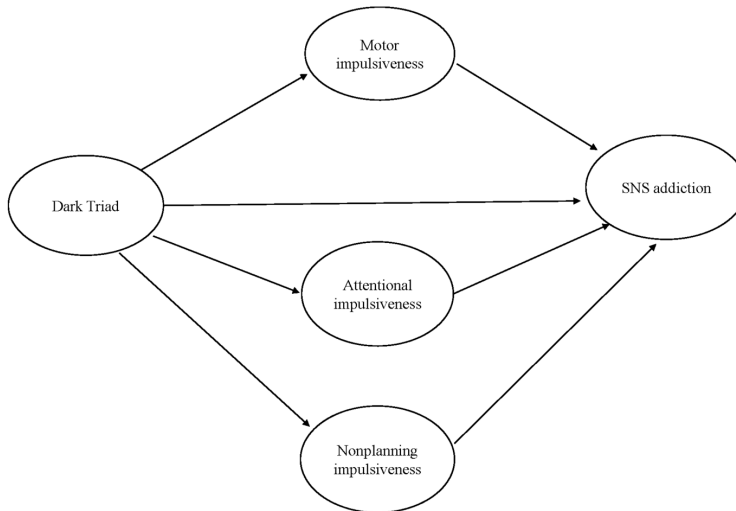
## The Present Research

At the present, evidences have supported that individuals with a high Dark Triad are vulnerable to problematic use of SNS (Kircaburun et al., 2018) and SNS addiction (Chung et al., 2019; Lee, 2019). This vulnerability has been linked to the impulsiveness of the Dark Triad (Crysel et al., 2013; Jones & Paulhus, 2011; Jonason & Tost, 2010; Malesza & Ostaszewski, 2016). Relatedly, the impulsiveness display by individuals with high dark traits is indicative of heightened risk of SNS addiction (Błachnio & Przepiorka, 2016b; Delaney, Stein, & Gruber, 2018; Hoffman et al., 2012; Wu et al., 2013). Hence, theoretically, the Dark Triad that facilitates impulsiveness is indicative of the risk of SNS addiction (Chung et al., 2019; Lee, 2019). The proposed link of the Dark Triad, impulsiveness, and SNS addiction remain unexplored albeit previous recommendation (Lee, 2019). Thus, the present research posits that the Dark Triad exerts its influence on SNS addiction through the associated impulsiveness among adolescents.

The research will examine the proposed relationships of the Dark Triad, impulsiveness, and SNS addiction with adolescents. As depicted previously, the rapid development of communication technology resulted the convenient access to SNS (Sampasa-Kanyinga & Lewis, 2015). Consequently, users from younger age group, such as adolescents, that share the same convenient access to SNS as their older counterparts are at risk of developing SNS addiction (Błachnio & Przepiorka, 2016a; Błachnio et al., 2015; Jafarkarimi et al., 2016). In relation to the Dark Triad, research has supported the saliency of the dark traits in childhood and adolescents (De Clercq et al., 2017). A contributing aspect to the saliency of these traits is the quality of parenting care received at young age (Jonason et al., 2014). The fostered dark traits are highly relevant to the development of children and adolescents' theory of mind skills that allow them to gain dominance and social status (Stellwagen & Kerig, 2013). Consistent with findings made with young adults (e.g. Crysel et al., 2013), adolescents with salient Dark Triad traits are highly impulsive (Malesza & Ostaszewski, 2016; Muris et al., 2013) and are more likely to engage in high risk behaviours (Chabrol et al., 2015; Wright et al., 2017). Evidences have supported that the conceptualization of the Dark Triad for young adults and adolescents is similar, indicating that this dark construct of personality is valid for adolescents and vigorous investigation with this age group is imperative to deepen the present perspective (Klimstra et al., 2014).

Based on the review of literature, this research aims to examine the relationships of the Dark Triad, SNS addiction, and impulsiveness with adolescents. In addition, the present research will explore the indirect effects of the measured impulsiveness on the influence of the Dark Triad on SNS addiction. Figure 1 depicts the conceptual model of the present research. This model portrays the direct link of the Dark Triad and SNS addiction, which is consistent with previous findings on the facilitative effect of the dark traits (Chung et al., 2019; Lee, 2019). In the same model, the Dark Triad link to impulsiveness, as suggested by previous findings on the impulsive nature of the dark personality (Crysel et al., 2013; Jones & Paulhus, 2011; Jonason & Tost, 2010; Malesza & Ostaszewski, 2016). The impulsiveness link to SNS addiction, as previous research has revealed that impulsiveness as a risk factor of SNS addiction (Błachnio & Przepiorka, 2016b; Cudo et al., 2019; Delaney et al., 2018; Rothen et al., 2018; Turel & Qahri-Saremi, 2018; Wu et al., 2013).

Figure 1. Conceptual model depicting the indirect effect of impulsiveness on the relationship of the Dark Triad and SNS addiction



## METHOD

### Participants

Participants were 169 adolescents (male = 89, 53%; female = 79, 46%, not mentioned = 1, 1%). Majority of the participants were Chinese ( $n = 112$ , 66%), followed by Malay ( $n = 31$ , 18%), Indian ( $n = 18$ , 11%), and those from other ethnic groups ( $n = 8$ , 5%). The age range was 14-17 ( $M = 15.40$ ,  $SD = .97$ ).

### Procedure

Permission to conduct the survey was obtained from the principal of a private school in Kuala Lumpur. Informed consents were obtained from participants' legal guardians. After obtaining the informed consents, participants were required to complete the questionnaire given. To ensure anonymity, no identifier was assigned to the questionnaire. Hence, withdrawal from this study is impossible after the submission of the questionnaire. No monetary reward was offered to the participants.

Data analyses were conducted with SPSS 25. The total and specific indirect effects of impulsiveness on the Dark Triad and SNS addiction were estimated with PROCESS v3.0 (Hayes, 2017; see also Preacher and Hayes, 2008). Significance of the estimated effects was assessed with bootstrap analysis with 5000 replications. The significance of the estimated effects is supported if the range for the 95% percentile CI does not contain zero (Hayes, 2017; Preacher & Hayes, 2008).

### Measures

Demographic details such as age, gender and ethnicity, were collected at the beginning of the questionnaire.

The Dark Triad personality was measured with the Dirty Dozen (Jonason & Webster, 2010). The 12 items were rated on a 5-point scale (1 = Not at all, 5 = Very much). A sample item is "I tend to lack remorse". It consists of three subscales, namely Machiavellianism ( $\alpha = .68$ ), psychopathy ( $\alpha = .51$ ), and narcissism ( $\alpha = .76$ ). Psychometric properties of this scale, which include structural and

test-retest reliability, and convergent and discriminant validity, were supported (Jonason & Webster, 2010). In this study, the composite score of the Dark Triad was used ( $\alpha = .75$ ) since it has greater validity than the subscales (Jonason et al., 2013).

SNS addiction was measured with the modified Bergen Facebook Addiction Scale (Andreassen et al., 2012). The six items were rated on a 5-point scale (1 = Very rarely, 5 = Very often). A sample item is “How often during the last year have you spent more time on SNS than initially intended?”. Psychometric properties of this scale, which include test-retest reliability, convergent and discriminant validity, were supported (Andreassen et al., 2012). With the present sample, this measure exhibited high internal consistency ( $\alpha = .82$ ).

Impulsivity was measured with the Barratt Impulsiveness Scale – version 11 (Patton et al., 1995). The 30 items were rated on a 4-point scale (1 = Rarely/Never, 4 = Almost always/Always). A sample item is “I plan task carefully”. This measure consists of three subscales that reflect on attentional impulsiveness (inability to concentrate;  $\alpha = .53$ ), motor impulsiveness (acting without thinking;  $\alpha = .52$ ), and nonplanning impulsiveness (lack of future orientation;  $\alpha = .54$ ). Psychometric properties of this scale, which include test-retest reliability, convergent and concurrent validity, were supported (Stanford et al., 2009).

## RESULTS

### Data Cleaning

The percentages of missing values ranged from 3% - 9.5%. Little’s (1988) MCAR test indicated that these values were missing at random,  $\chi^2(28) = 21.62, p = .79$ . Thus, they were estimated with EM imputation. Outliers were identified with (1) z score larger than 3.29, (2) a  $p < .001$  for Mahalanobis’ distance, and (3) a Cook’s distance larger than 1.00 (Tabachnick & Fidell, 2012). One univariate outlier was detected for attentional impulsiveness. This extreme value was transformed into a smaller value to reduce its impact on the data. Mahalanobis’ distance and Cook’s distance indicated the absence of multivariate outlier. Normality was assumed if the variables exhibit the skewness  $< \pm 2$  and kurtosis  $< \pm 3$  (Kline, 2005). The range of skewness (-.44 - .54) and kurtosis (-.70 - .39) indicated that the variables were normally distributed. Pearson’s correlations revealed that all variables were positively correlated. From the effect sizes, there was no indication of redundancy or multicollinearity. Overall, there was no violation of the assumptions for the analysis of indirect effects (Hayes, 2017; see also Preacher and Hayes, 2008).

### Descriptive Statistics and Correlations

Descriptive statistics and Pearson’s correlations were summarized in Table 1. As shown in Table 1, the Dark Triad composite score was positively correlated with SNS addiction. This suggests that adolescents with salient dark personality are prone to SNS addiction. Additionally, the Dark Triad was positively correlated with the different aspects of impulsivity. This implies that adolescents with prominent dark features are highly impulsive. Lastly, SNS addiction was significantly correlated with motor impulsiveness. It did not correlate significantly with other aspects of impulsiveness.

### Total and Indirect Effects

Figure 2 depicts the multiple mediation model. As shown in Figure 2, the direct effect of the Dark Triad ( $b = .29, p = .01, 95\% \text{ CI } [.07, .51]$ ) on SNS addiction was significant,  $R^2 = .04, F(1, 167) = 6.85, p = .01$ . The Dark Triad ( $b = .18, p < .001, 95\% \text{ CI } [.06, .29]$ ) predicted attentional impulsiveness significantly,  $R^2 = .05, F(1, 167) = 8.93, p < .001$ . Subsequently, the Dark Triad ( $b = .14, p = .01, 95\% \text{ CI } [.04, .24]$ ) predicted motor impulsiveness significantly,  $R^2 = .04, F(1, 167) = 7.82, p = .01$ . The Dark Triad ( $b = .12, p = .02, 95\% \text{ CI } [.02, .22]$ ) also predicted nonplanning impulsiveness significantly,  $R^2 = .03, F(1, 167) = 5.30, p = .02$ . Overall, the Dark Triad significantly predicted all of the measured aspects of impulsiveness. The overall predictive model of the Dark Triad and the aspects

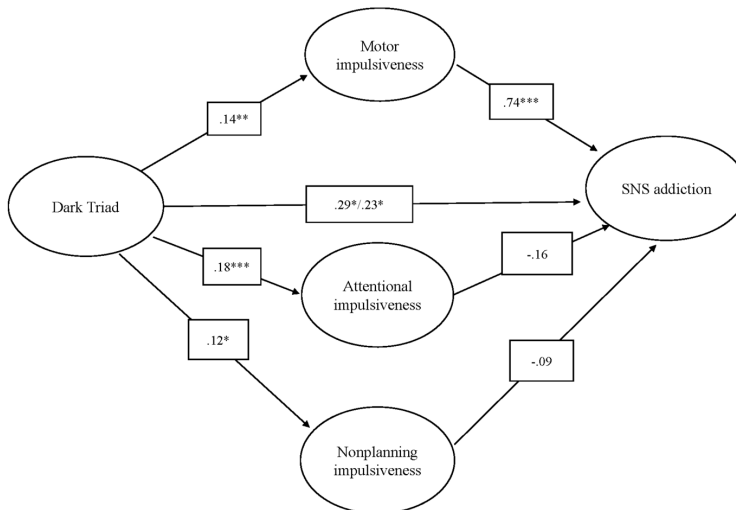
Table 1. Descriptive Statistics and Correlations (N = 169)

Variables	M(SD)	1	2	3	4	5
1.Dark Triad composite	2.49(.56)	1	.19**	.23**	.21**	.17*
2.SNS addiction	1.95(.82)	–	1	.05	.33**	.01
3.Attentional impulsiveness	2.41(.44)	–	–	1	.33**	.24**
4.Motor impulsiveness	2.21(.37)	–	–	–	1	.13
5.Nonplanning impulsiveness	2.36(.38)	–	–	–	–	1

NOTE: \* $p < .05$ , \*\* $p < .01$

of impulsiveness was significant,  $R^2 = .14$ ,  $F(4, 164) = 6.45$ ,  $p < .001$ . The direct effect of the Dark Triad ( $b = .23$ ,  $p = .04$ , 95% CI [.01, .45]) on SNS addiction remain significant when the measured aspects of impulsiveness were included into the predictive model. Attentional impulsiveness ( $b = -.16$ ,  $p = .29$ , 95% CI [-.45, .14]) and nonplanning impulsiveness ( $b = -.09$ ,  $p = .60$ , 95% CI [-.401, .23]) were not significant predictors of SNS addiction. Only the measured motor impulsiveness ( $b = .74$ ,  $p < .001$ , 95% CI [.00, .39]) significantly predicted SNS addiction.

Figure 2. Conceptual model with the direct effects of the Dark Triad on impulsiveness and SNS addiction, and impulsiveness on SNS addiction.



The estimated indirect effects and the range of 95% CI were summarized in Table 2. As shown in Table 2, the total indirect effect of  $.07$ , 95% CI [-.03, .18], was not significant. The significance of specific indirect effects were examined since a significant total indirect effect is not mandatory (Preacher & Hayes, 2008).

**Table 2. Indirect Effects of the Measured Impulsiveness on the Relationship of the Dark Triad and SNS Addiction (N = 169)**

Mediators	Indirect effect	95% percentile CI	
		Lower limit	Upper limit
Total	.07	-.03	.18
Attentional impulsiveness	-.03	-.10	.03
Motor impulsiveness	.10	.03	.20
Nonplanning impulsiveness	-.01	-.05	.03

As shown in Table 2, the indirect effects of attentional impulsiveness (indirect effect = -.03, 95% CI [-.10, .03]) and nonplanning impulsiveness (indirect effect = -.01, 95% CI [-.05, .03]) were not significant. Only the indirect effect of motor impulsiveness (indirect effect = .10, 95% CI [.03, .20]) was significant.

## DISCUSSION

The present research examined the indirect effects of the measured impulsiveness on the relationship of the Dark Triad and SNS addiction with adolescents. The present research also addressed the gap from similar previous attempt that hypothetically linked the impulsiveness of the Dark Triad with SNS addiction (Lee, 2019). The present findings are consistent with previous findings. Firstly, the positive relationship of the Dark Triad and SNS addiction is consistent with previous findings (Chung et al., 2019; Lee, 2019). This finding indicates that adolescents with salient dark features are vulnerable to SNS addiction. Additionally, the positive relationships of the Dark Triad and the measured impulsiveness are consistent with past findings that have associated the dark personality with impulsiveness (Crysel et al., 2013; Jones & Paulhus, 2011; Jonason & Tost, 2010; Malesza & Ostaszewski, 2016). This supports that the dark traits emerged at early stage of development (De Clercq et al., 2017), and manifested into the corresponding behavioural outcomes, such as impulsiveness (Malesza & Ostaszewski, 2016; Muris et al., 2013).

The present findings found that the measured attentional and nonplanning impulsiveness did not correlate significantly with SNS addiction. Only the measured motor impulsiveness correlated significantly with SNS addiction. Henceforth, the obtained results corroborated previous findings on the facilitative role of impulsiveness on SNS addiction (Błachnio & Przepiorka, 2016b; Cudo et al., 2019; Delaney et al., 2018; Rothen et al., 2018; Turel & Qahri-Saremi, 2018; Wu et al., 2013). These findings contributed to the vast literature by supporting that different aspects of impulsiveness relate differently to SNS addiction. The present findings also highlighted that the theoretical distinction amongst aspects of impulsiveness is crucial. Although there is an overlap amongst the facets, each of them retain their own uniqueness that is crucial to subsequent interpretations (Patton et al., 1995). Moreover, the measurements of impulsiveness have significant theoretical implication to research. For instance, previous research revealed that behavioural indicator of impulsiveness did not significantly correlate with SNS addiction (Chung et al., 2019), which may have led to dismissal of the theoretical link of SNS addiction and impulsiveness. As mentioned by Stanford et al. (2009), self-report measures such as the Barratt Impulsiveness Scale – version 11 (Patton et al., 1995) assess impulsiveness over extended period of time and reflect directly on the subjective experiences associated with impulsiveness, whereas behavioural procedures assess state-dependent aspects of impulsivity (Dougherty, Mathias, & Marsh 2003).

### Indirect Effects of Impulsiveness

The significance of the total indirect effects of the measured impulsiveness on the relationship of the Dark Triad and SNS addiction was not supported by the analysis. This finding suggests that the

model consists both a mediation effect and a suppression effect (Preacher and Hayes, 2008). The suppression effects are notable in the direct effects of attentional and nonplanning impulsiveness on SNS addiction, where the analysis revealed that these aspects of impulsiveness reduce the likelihood to develop SNS addiction. These results are opposing previous findings on the facilitative role of impulsiveness in SNS addiction (Błachnio & Przepiorka, 2016b; Hoffman et al., 2012; Wu et al., 2013). In the same model, the direct effect of motor impulsiveness on SNS addiction was the highest of all the effects examined. This suggests that the entry of attentional and nonplanning impulsiveness enhanced the positive association of motor impulsiveness and SNS addiction. This indicates that the shared variances amongst these aspects of impulsiveness were removed, bolstering the facilitative effect of motor impulsiveness on SNS addiction. Therefore, the suppression had weakened the direct effects of attentional and nonplanning impulsiveness on SNS addiction, and their indirect effects on the relationship of the Dark Triad and SNS addiction. This resembles a case of classical suppression (Horst, 1941; Paulhus et al., 2004). In this light, only the specific indirect effect of motor impulsiveness on the relationship of the Dark Triad and SNS addiction was significant.

Of the three aspects of impulsiveness, only the measured motor impulsiveness exerted significant influence on the relationship of the Dark Triad and SNS addiction. The saliency of these three aspects of impulsiveness are indicative of neurocognitive deficits (Stanford et al., 2009). In general, the three aspects of impulsiveness outlined by the Barratt Impulsiveness Scale – version 11 (Patton et al., 1995) were all related to deficits in different aspects of executive functioning (Cheung, Mitsis, & Halperin, 2004; Whitney, Jameson, & Hinson, 2004). In particular, non-planning and attentional impulsiveness relate strongly with strategic planning, whereas motor impulsiveness was associated with poor impulse control (Spinella, 2005). Deficiency in impulse regulation is an instrumental feature of the Dark Triad (e.g. Crysel et al., 2013), which accounted for the preference for immediate reward and gratification amongst individuals with salient dark traits (Birkás & Csathó, 2015; Jonason et al., 2010). Hence, individuals with salient dark traits have been described with attention deficit and poor executive functioning (Jonason et al., 2010). The significance of the Dark Triad as predictor of motor impulsiveness is consistent with these findings. This implies that adolescents with high levels of the Dark Triad are at risk of certain neurocognitive deficits. The present finding suggests that these adolescents are highly impulsive. The significant direct effect of the Dark Triad on SNS addiction is consistent with previous findings (Chung et al., 2019; Lee, 2019). However, the significant indirect effect of motor impulsiveness dismissed the parsimonious direct effect. The significant indirect effect of motor impulsiveness suggests that the impulsivity associated with the Dark Triad facilitated SNS addiction. This finding is instrumental in addressing a gap from previous research, where the poor self-regulation of the Dark Triad has been proposed as the underlying risk factor of SNS addiction (Lee, 2019). This finding supports the hypothetical indirect effect of impulsiveness on the direct effect of the Dark Triad and SNS addiction. The significant indirect effect of motor impulsiveness is consistent with previous findings on the rudimentary role of impulsiveness in shaping SNS addiction (Błachnio & Przepiorka, 2016b; Cudo et al., 2019; Delaney et al., 2018; Rothen et al., 2018; Turel & Qahri-Saremi, 2018; Wu et al., 2013). This result also supported that deficit in executive functioning, which is associated with motor impulsiveness (Spinella, 2005), is fundamental to development of SNS addiction (Błachnio & Przepiorka, 2016b; Cudo et al., 2019; Delaney et al., 2018; Rothen et al., 2018; Turel & Qahri-Saremi, 2018; Wu et al., 2013).

Overall, the obtained results extend previous findings on excessive SNS use due to unregulated urges (Hoffman et al., 2012). The present research extends that adolescents with salient dark personality are prone to SNS addiction due to underlying impulsiveness, which may have neurocognitive origins. The present findings also supported the notion of SNS OCD proposed previously, which is characterized by excessive use of SNS induced by OCD-related thoughts (Lee et al., 2015). Theoretically, motor impulsiveness (e.g. Cheung et al., 2004) and obsessive beliefs (e.g. Bradbury, Cassin, & Rector, 2011) are associated with deficits in executive functioning. Therefore, it is plausible that adolescents with prominent dark personality are vulnerable to the deleterious effects of SNS addiction, such as



depression (e.g. Jelenchick, Eickhoff, & Moreno, 2013). As this is out of the present scope, future verifications are needed.

## Theoretical Implications

The present findings support the influence of the Dark Triad on adolescents' SNS addiction. Underlying this relationship is the impulsiveness that has been linked to both dark personality (Crysel et al., 2013; Jones & Paulhus, 2011; Jonason & Tost, 2010; Malesza & Ostaszewski, 2016) and SNS addiction (Błachnio & Przepiorka, 2016b; Cudo et al., 2019; Delaney et al., 2018; Rothen et al., 2018; Turel & Qahri-Saremi, 2018; Wu et al., 2013). The present research posited that the Dark Triad facilitates risk factors such as impulsiveness (Błachnio & Przepiorka, 2016b; Cudo et al., 2019; Delaney et al., 2018; Rothen et al., 2018; Turel & Qahri-Saremi, 2018; Wu et al., 2013) that are instrumental to the development of SNS addiction. Therefore, adolescents with salient dark personality are vulnerable to addictive use of SNS due to the aversive aspects of the Dark Triad. This illustrates the complexity of the influence of the dark personality on SNS usages. Hence, assuming the direct relationship of personality and SNS addiction may severely limit the theoretical interpretations of the results. This research strongly recommend future research to elaborate the conceptual link of personality and SNS addiction through the inclusion of intervening variables. However, the effect sizes of the direct and indirect effects indicate that the Dark Triad and the measured impulsiveness have limited explanatory power. As indicated from the results, of the three aspects of impulsiveness, only motor impulsiveness exerted significant influence on the relationship of the Dark Triad and SNS addiction. This imply that different aspects of impulsiveness exert different effects on the aforementioned relationship. As the measured motor impulsiveness is one of the facets of impulsiveness, the small effect size imply that other aspects of impulsiveness are more influential. Therefore, this limitation presents a prospect for future research, which consolidated the aforementioned recommendation to expand the conceptual link of personality and SNS addiction with other plausible risk factors as intervening variables. The present findings imply that deficits in executive functioning underlie the proneness to SNS addiction amongst adolescent with salient dark personality. In support of this view, deficits in executive functioning induced impulsivity (e.g. Bickel, Jarmolowicz, Mueller, Gatchalian, & McClure, 2012) that is instrumental to SNS addiction (e.g. Błachnio & Przepiorka, 2016b). However, these findings could not concretely support neurocognitive deficits as the underlying factors that induce addictive SNS use. This concern has been acknowledged in previous research, which remain unaddressed at the present (Delaney et al., 2018). This marks a prospect for future research.

Although the present findings have supported that the Dark Triad is facilitative of SNS addiction through motor impulsiveness, there is no indication that this form of behavioural addiction is maladaptive to adolescents. Albeit the associated aversive outcomes of the Dark Triad (e.g. Bogolyubova et al., 2018), the behavioural outcomes associated to salient Dark Triad are mainly directed to the benefits of these individuals (e.g. Jonason & Schmitt, 2012). Hence, individuals with salient dark personality have the inclination to benefit themselves at the expenses of others, and tend to avoid outcomes that are detrimental to themselves (Moshagen, Hilbig, & Zettler, 2018). Empirical findings have supported this inclination, where SNS have served as medium to gratify their personal needs for short-term relationships (Timmermans et al., 2018), and to self-affirm by inflicting aggression on others (Bogolyubova et al., 2018; March et al., 2017; Pabian et al., 2015). Reflecting from this, it is plausible that adolescents with high Dark Triad relied heavily on SNS to increase potential benefits and gratifications from their contacts on SNS. Hence, heavy use of SNS may not be a sign of pathology, but a form of adaptive behaviour, where these online platforms have been actively utilized to maximize social benefits. The present research has neglected this possibility, which paves the prospect for future research. However, the present findings supported the maladaptive aspects of the Dark Triad, where such individuals tend to be highly impulsive, resulting in failure to regulate usage of SNS. To further illustrate the complex relationships of the dark personality, impulsiveness, and addiction towards SNS, future research can consider the roles of individual dark

traits and their corresponding facets (see Furnham, Richards, & Paulhus, 2013). This aspect was not pursued in this research, since the use of subscales may weakened psychometrics of the scale used to assess the dark personality (Jonason et al., 2013). In fact, measurements of dark personality have been criticized for their inadequacy (e.g. Muris, Merckelbach, Otgaar, & Meijer, 2017). Hitherto, this limitation is not unique to the present research.

## **LIMITATIONS AND CONCLUSION**

Despite the theoretical implications of the present findings, a few limitations should be noted. Firstly, the correlational design employed does not allow for causal interpretations of the findings. Future research that intends to extend the present investigation can benefit from experimental and longitudinal designs. Secondly, adolescents have responding styles that distort psychometrics of psychological measures (Navarro-González et al., 2016). This is evident in the Barratt Impulsiveness Scale – version 11's subscales with poor Cronbach's  $\alpha$  (Patton et al., 1995), which may have indirectly contaminated the present results. Therefore, researchers should note that validation of psychological measures with Malaysian sample is an important aspect that can be pursued. Moreover, the validity of the theoretical construct of the Dark Triad is relatively fragile within Asian countries (Arseneault & Catano, 2019). Pairing with issues with measurements of the dark traits (e.g. Muris et al., 2017), the interpretations of the present results are vague. Although this aspect may have weakened the validity of the present research, it does not discount the theoretical contributions of this research. Thirdly, the present research posited that the link of the Dark Triad is facilitative of SNS addiction due to deficit in executive functioning. This aspect requires further validation as this research did not attempt to gauge the levels of executive functioning. As there are various aspects of executive functioning, it is imperative to disentangle the specific cognitive aspects that induce SNS addiction. Fourthly, although adolescents with salient dark traits are prone to SNS addiction, there is no indication that the heavy use of these online platforms is reflecting on any pathological aspects. The heavy use of SNS may reflect on the ongoing efforts to edit the contents on SNS for the sake of social desirability (Fox & Rooney, 2015), which can be adaptive to the adolescents' social influence. The pathological aspects of SNS usage for individuals with salient dark features should be addressed in future research.

Consistent with previous findings, the Dark Triad is facilitative of SNS addiction (Chung et al., 2019; Lee, 2019). The present research found the significant indirect effect of motor impulsiveness on the relationship of the Dark Triad and SNS addiction. This finding implicates the complexity of the influence of personality traits on the associated behavioural outcomes. However, there is no indication that such a heavy use of SNS is pathological. Further efforts are required to address the pathological aspects of addictive SNS use amongst users with a high level of the Dark Triad. Despite the significant indirect effect of the measured motor impulsiveness, the effect sizes suggest for further exploration with different intervening variables.

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