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Adaptation and Psychometric Assessment of Short Dark Triad Questionnaire In The Indian Context

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ABSTRACT:

Background: Numerous research endeavors have explored how well the SD3 applies across diverse cultural settings, spanning from Portugal and Serbia to Delhi, the UK, and Kolkata. This study, with a particular focus on validating the tool in the Indian context, contributes to the existing body of research and expands upon the limited studies conducted in India.

Materials and methods*:* To gather data for this research, 652 secondary school students from West Bengal attending coeducational institutions, aged between 14 and 18, were randomly chosen. Participants were selected based on a predefined factor structure. The initial stage involved cleaning the data obtained from the research tool and transferring it to SPSS version 23.0, a user-friendly statistical software program.

Results: Analyzing a total of twenty-six items, the study identified three distinct factors: "Machiavellianism," "Narcissism," and "Psychopathy," consistent with the original SD3 scale. The findings suggest that the Indian adaptation of the scale is both valid and reliable for assessing Dark Personalities among adolescents aged 14 to 18.

Conclusion: The psychometric analysis reveals that the current scale possesses sufficient qualities to evaluate dark personality traits in Indian teenagers. This scale holds promise as a significant tool for gauging the prevalence and underlying mechanisms of psychosocial factors contributing to dark personality traits among adolescents in school settings.

Keywords: narcissism, machiavellianism, psychopathy, dark triad

1. Introduction

Personality traits have predictive value for significant life outcomes, such as involvement in criminal activities and antisocial behavior (Burt et.al., 2008). These characteristics are often associated with both substance abuse and persistent antisocial behavior (Krueger, 1999). In their 1950 research, Schuessler and Cressey analyzed 42% of the available "personality tests" and observed significant disparities in personality traits between criminals and noncriminals. Waldo et al., (1967) found that 81% of more recent studies exploring the link between personality traits and criminal behavior were able to differentiate between these two groups. According to Miller et al., (2001) revealed that 80% of personality assessments conducted during that period identified substantial differences between noncriminals and criminals.

The term "dark triad" encapsulates three discrete yet interrelated facets of maladaptive personality: "Narcissism" , "Machiavellianism" and "Psychopathy" (Paulhus et.al., 2002). According to observations by Zettler et al., (2013) these traits have been linked to negative behaviors in professional settings, including deceit and workplace misconduct. According to Schyns (2015), recent research highlights the importance of comprehending the situations and environments in which dark triad personality traits may be advantageous.

Wilson et al., (1996) propose that "Machiavellianism" is characterized by traits such as cunning, conceit, and wit, often employing deceitful methods to advance personal objectives. "Psychopathy" as defined by Tariq et.al., (2021) encompasses impulsivity, superficiality, a lack of empathy or remorse, and manipulative tendencies. According to Tariq et.al., (2021) individuals with narcissistic traits often exhibit a sense of superiority, seek validation and praise, and may display callous, unempathetic behavior to garner attention. Hare (2003) further divides psychopathy into two interrelated factors: "Secondary Psychopathy" characterized by antisocial behavioral tendencies, and "Primary Psychopathy" characterized by ruthless and deceitful conduct.

2. Materials And Methods

Study Design and Setting
The aim of this cross-sectional study was to assess the psychometric properties of the SD3 (Jones et.al., 2014) scale among secondary school students.

Study Participants and Sampling
Convenience sampling was employed to select 700 secondary school students from West Bengal, aged between 14 and 18. While 652 participants responded to the surveys initially distributed, 48 questionnaires were excluded due to incomplete or erroneous data. Thus, the final dataset comprised 652 responses from the 700 secondary school students. It's worth mentioning that Bentler et al., (1987) as cited by Arifin et al., (2016) recommended a minimum subjects-to-item ratio of 10:1.

Data Collection Tool and Technique
The SD3 model encompasses 27 traits that collectively capture the Dark Triad. These traits are grouped into three components—"Machiavellianism" "Narcissism" and "Psychopathy" —each consisting of nine items. These items were developed by Jones et.al., (2014). Participants utilize a Likert scale ranging from 1 to 5, where 1 denotes "strongly disagree" and 5 denotes "strongly agree," to indicate their level of agreement with the statements associated with each component.

Ethical Consideration

The study obtained approval from the Ethical Committee of Lovely Professional University, with the assigned approval number LPU/IEC-LPU/2024/1/14.

3. Result

Demographic Data

Participants included 652 secondary school adolescents (14–18 years), with a percentage of 50% girls and 50% boys. The percentage of secondary students aged 14 years, 15 years, 16 years, 17 years and 18 years are 10.7 %, 9.5 %, 32.1 %, 38.5 % and 9.2 % respectively. All demographic data were presented in Table 1.

Table 1. Demographic data

Variable	Categories	n	%
Gender	Boys	326	50
	Girls	326	50
Age	14	70	10.7
	15	62	9.5
	16	209	32.1
	17	251	38.5
	18	60	9.2

Table – 2: Reliability data regarding the SD3-27

Dimension	Items	ITCC(DW)	ICA(DW)	ITCC	ICA(27 entries)
"Machiavellianism"	M1	0.972		0.579	
	M2	0.969		0.565	
	M3	0.811		0.507	
	M4	0.939		0.534	
	M5	0.962	0.989	0.579	
	M6	0.969		0.576	
	M7	0.962		0.565	
	M8	0.962		0.591	
	M9	0.988		0.588	
"Narcissism"	N1	0.778		0.333	
	N2	0.763		0.379	
	N3	0.762		0.353	0.892
	N4	0.768		0.316	
	N5	0.788	0.943	0.337	
	N6	0.737		0.341	
	N7	0.819		0.315	
	N8	0.824		0.333	
	N9	0.788		0.382	
"Psychopathy"	P1	0.791		0.526	
	P2	0.868		0.547	
	P3	0.704	0.924	0.437	
	P4	0.853		0.51	
	P5	0.849		0.514	

	P6	0.754		0.489	
	P7	0.734		0.429	
	P8	0.027		0.084	
	P9	0.837		0.487	

Note: ITCC(DW) = "Item-Total Correlation Corrected (Dimension-wise)", ICA(DW) = "Index of Cronbach's Alpha (Dimension-wise)" ITCC = "Item-Total Correlation Corrected" ICA(27 entries) = " Index of Cronbach's Alpha (27 entries)"

The researchers utilized AMOS version 23 and SPSS software to analyze the data. The SD3-27 scale exhibited strong internal consistency in the Indian sample, with a Cronbach's alpha coefficient of 0.892. Table 2 provided a revised item-total correlation analysis and details on how removing specific items impacted Cronbach's alpha values. Following the recommendation by Yasir (2016), item P8 in the "Psychopathy" dimension was excluded from further analysis due to its adjusted item-total correlation falling below 0.30. However, all other data from the study were retained for subsequent analysis.

Reintroducing item P8, as described by Jones et.al., (2014) with a "Callous effect," following the recommendations of Kyriazos et al., (2018) and Kline (2018), as cited by Chakraborty et al., (2021) led to an improvement in internal consistency within the psychological construct. Utilizing Cronbach's alpha coefficient, this improvement was assessed at 0.60. According to George et.al., (2019) definition of Cronbach's alpha, values higher than 0.80 are considered acceptable (Gupta et al., 2019). Additionally, Kim et al., (2016) suggest that internal consistency is deemed exceptional when it exceeds 0.9 and decent when it falls between 0.7 and 0.9.

After removing item P8 from the "Psychopathy" dimension, Cronbach's Alpha was recalculated for each of the three Dark Triad personality traits. The updated Cronbach's Alpha values for psychopathy, narcissism, and Machiavellianism were 0.924, 0.989, and 0.943, respectively. Additionally, the total Dark Triad scale Cronbach's Alpha index, including all dimensions and revised item sets, was 0.892. This adjustment demonstrates that the scale's internal consistency improved following the elimination of item P8 from the Psychopathy dimension.

Exploratory Factor Analysis (Efa)

Table 3 presents descriptive statistics for the SD3-26 scale along with the factor loadings obtained through CFA. EFA was performed on a subset of 326 secondary school students. Using varimax rotation and Kaiser Normalization, three factors were extracted and labeled as "Machiavellianism," "Narcissism," and "Psychopathy." Items that did not meet the threshold of 0.4 for factor loadings, as per the criteria established by Chan et al., (2017) were excluded from the analysis.

In Table 3, it is observed that all factor loadings within the three dimensions exceeded 0.4, with no instances of cross-loadings. Collectively, these variables explained 78.304% of the variance. The primary component contributed to 32.887% of the variance, while the subsequent two components explained 24.691% and 20.726% of the variance, respectively. The first three eigenvalues retrieved and retained were 8.551, 6.420, and 5.389.

Hutcheson et.al., (1999) as cited by Karaca et al., (2022) suggest that a Kaiser-Meyer-Olkin (KMO) measure falling within the range of 0.7 to 0.8 denotes a good sample size, while a range of 0.8 to 0.9 denotes quality. A KMO measure exceeding 0.9 is considered notable. The KMO score of 0.925 obtained for the study indicates that the sample size and data collected were adequate for conducting factor analysis (Karaca et al., 2022).

According Taherdoost et al., (2022) factor analysis is deemed inappropriate unless the results of Bartlett's test of sphericity chi-square are statistically significant, typically at a significance

level of p < 0.05. Moreover, the absence of an identity matrix in the matrix further supports the suitability of factor analysis, as emphasized by the aforementioned authors.

Table– 3: Factor loadings resulting from data and CFA on the SD3-26

	Items	Mean	SD	Factor loading		
				Mach	Nar	Psy
Mach	M1	4.1196	0.7154	0.977		
	M2	4.1196	0.7154	0.976		
	M3	4.0675	0.79714	0.842		
	M4	4.1227	0.68183	0.95		
	M5	4.1196	0.7154	0.97		
	M6	4.1196	0.7154	0.974		
	M7	4.1196	0.7154	0.969		
	M8	4.1196	0.7154	0.969		
	M9	4.1288	0.69413	0.99		
Nar	N1	3.5828	0.68222		0.826	
	N2	3.5644	0.67516		0.816	
	N3	3.5828	0.66394		0.813	
	N4	3.5828	0.67314		0.819	
	N5	3.5859	0.66355		0.838	
	N6	3.6104	0.65521		0.792	
	N7	3.5982	0.64297		0.86	
	N8	3.5951	0.6482		0.866	
	N9	3.5828	0.66855		0.833	
Psy	P1	3.7699	0.81476			0.843
	P2	3.8067	0.82055			0.906
	P3	3.819	0.83817			0.768
	P4	3.7975	0.82767			0.895
	P5	3.7761	0.84244			0.894
	P6	3.8221	0.82216			0.811
	P7	3.8221	0.82589			0.796
	P9	3.7914	0.84091			0.887
Eigen Values				8.551	6.42	5.389
% of variance				32.889	24.691	20.726
Cumulative %				32.887	57.578	78.304

Note: Mach="Machiavellianism", Nar= "Narcissism", Psy = "Psychopathy"

Confirmatory Factor Analysis (CFA)

According to Gupta et al., (2019) Confirmatory Factor Analysis (CFA) is a structural equation modeling method known as the "linear structural relationship model". In this investigation, CFA was conducted on a sample of 326 secondary school pupils.

To determine whether the model was adequate, the fit indexes were carefully examined. As to Hu et.al., (1999) standards, a suitable model ought to fulfill the subsequent requirements: a PClose value greater than 0.05 (0.015 in this case); a Standardized Root Mean Square Residual (SRMR) below 0.08 (0.037 in this study); a Root Mean Square Error of Approximation (RMSEA) lower than 0.06 (0.059 observed); a Tucker-Lewis Index (TLI) exceeding 0.95 (0.966 in this example); and a Comparative Fit Index (CFI) greater than 0.95 (0.969 in this

instance). Taken together, these indices demonstrate a strong alignment between the model and the data, confirming the validity of the confirmatory factor analysis.
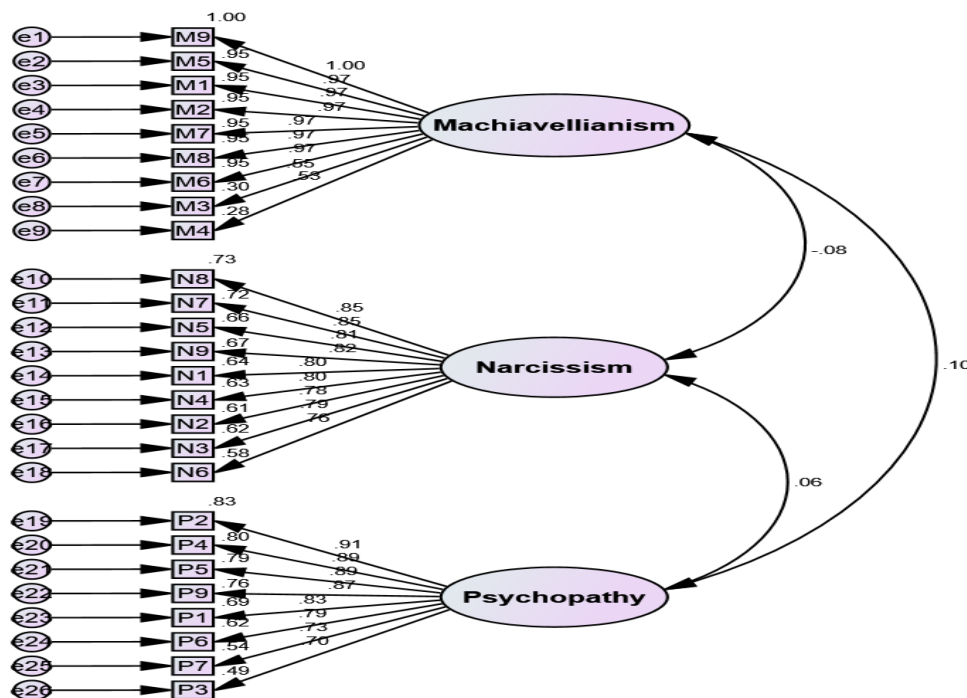

Figure 1: 3-Factor structure with factor laodings

Validity:

Gupta et al., (2019) emphasize the importance of evaluating both discriminant and convergent validity, along with experimental validity and reliability, to establish construct validity thoroughly.

Table-4: Summary of Validity Indices for Dark Triad Dimensions

Dimension	AVE	ASV	MaxR(H)	CR	MSV
Mach	0.807	0.203	1.000	0.973	0.010
Nar	0.651	0.185	0.945	0.944	0.006
Psy	0.689	0.006	0.956	0.946	0.010

Note: Mach="Machiavellianism", Nar= "Narcissism", Psy = "Psychopathy"

According to Hair et al., (2012) metrics such as Composite Reliability (CR) and Average Variance Extracted (AVE) are utilized to evaluate convergent validity, which indicates the strength of the relationship among items measuring a concept. If a construct's AVE exceeds 0.5 and its CR is greater than the AVE, it demonstrates convergent validity. Each concept presented in Table 4 exhibits AVE and CR values surpassing 0.5 and 0.7, respectively, satisfying the criteria for convergent validity.

Discriminant validity evaluates the distinctiveness of a construct compared to others. In this assessment, metrics such as Average Shared Variance (ASV), Maximum Shared Variance (MSV), and Average Variance Extracted (AVE) are utilized. According to Hair et al., (2012) and Jain et al., (2021) for discriminant validity to be established, each construct must meet the following criteria: ASV > AVE and MSV > AVE. Table 4 presents data indicating that the AVE for each construct surpasses its MSV and ASV statistics, thus confirming the discriminant validity of the scale.

Table- 5: An overview of the validation studies conducted by various researchers

Study	Participants		Items Removed Due to Low Factor Loading	Item No.s deleted in the present study
Pechorro et al., (2019)	412 young individuals from Portugal	Portugal	Because of their low loadings and low corrected item-total correlations, M1, M2, N6, N9, P1, and P2 were eliminated.	The P8 item of the Psychopathy dimension was excluded due to its low Corrected Item-Total Correlation.
Siddiqui et al., (2020)	Study 1: 490 males, 337 females, aged 18-21	Delhi, India	Fourteen items were removed from the assessment due to their low factor loading. Specifically, items 1, 2, 4, 7, 8, and 9 related to Machiavellianism, items 2, 5, 6, 8, and 9 related to Narcissism, and items 5, 6, and 7 related to Psychopathy were eliminated.	
	Study 2: 230 males, 149 females, aged 18-22			
	Study 3: 131 females, 37 males, aged 17-35			
Douglass et al., (2023)	343 individuals (56.90 % female) aged between 18 and 54 years	United Kingdom	None	
Dinić et al., (2018)	409 Serbian participants aged between 19 and 49 years	Serbia	None	
Zhang et al., (2020)	Study 1: Undergradute, Study 2: University students	Jiangsu, China	One item, specifically the P8 item of the Psychopathy dimension, was removed from the analysis due to its inadequate factor loading.	

This table summarizes the validation studies conducted by different researchers and indicates whether any items were removed from the SD3 scale due to low factor loading. As observed, in some studies, items were removed, while in others, no items were eliminated despite low factor loading.

4. Discussion

The objective of this research was to assess the reproducibility of the SD3 measure within an Indian population and to elucidate its underlying structure based on the three-factor model proposed by Jones et.al., (2014). The results of the Indian model revealed favorable psychometric properties and a robust structure for the measure. The primary aim of this study was to scrutinize the factor structure, convergent and discriminant validity, and overall validity of the SD3 questionnaire. Strong alignment was observed between the three-factor model devised by Jones et al., (2014) and the SD3 factor structure using confirmatory factor analysis (CFA).

Paulhus et.al., (2002) identified a strong correlation between these components and the three theoretical dimensions. Furthermore, model fit indices such as RMSEA and GFI indicated a good or reasonable fit for the model, along with the χ^2/df ratio. The study employed a methodologically rigorous questionnaire with the objective of statistically validating the Short Dark Triad (SD3) scale to assess the Dark Triad Personalities of Indian secondary school pupils. As a result, the scale met all criteria for validation specific to the Indian context, including validity, reliability, exploratory factor analysis (EFA), and confirmatory factor analysis (CFA).

Limitations And Suggestions For Future Research

Several limitations were present in our research. Firstly, employing a larger sample size could have yielded more precise results for confirmatory factor analysis, despite maintaining a consistent sample size. Furthermore, although college and university students are also potential users of the Short Dark Triad (SD3) scale, our study exclusively concentrated on secondary school students. Additionally, future research could enhance the generalizability of findings by replicating our work with time-series designs, longitudinal methodologies, and experimental settings.

Indeed, the utilization of self-reported questionnaires for data collection introduces the potential for response bias, representing another limitation. To mitigate these drawbacks, assessing test-retest reliability and comparing it with Jones et.al., (2014) findings could ensure internal consistency. Moreover, researchers might employ this measure in future studies to explore how Dark Triad personality traits influence teenage Indian students, thereby shedding light on the psychological characteristics of this demographic.

5. Conclusion

The success of the SD3 questionnaire in the Indian context is discussed, with the exception of one item (P8) related to the "Callous affect" dimension of psychopathy, which was excluded due to its low corrected item-total correlation (<0.30). Specifically, the statement, "I enjoy having sex with people I hardly know," was deemed less suitable in the Indian context. However, this assertion has been utilized across various contexts and sample sizes by Douglass et al., (2023) Zhang et al., (2020) and Pechoro et al., (2019). This data could serve as valuable insight for future studies aiming to assess adolescents' SD3 and potentially predict different behaviors and life trajectories. Consequently, our study may serve as a reference when applying the SD3 to teenage populations in subsequent research endeavors.

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