

The Correlation, Receiver-Operating Characteristics (ROC) analysis and percentiles: Validation of moral disengagement scale for adolescents

Saima Riaz, Zaqia Bano

Department of Psychology, University of Gujrat, Pakistan

Objective: To investigate the construct and criterion validity of moral disengagement scale for adolescents and to establish the percentile norms of scale.

Methodology: Cross sectional research design was used and adolescents studying in educational institutes from age 12-19 years were included in the study which was carried out in three phases. In the first phase, construct related evidences of validity were collected by convergent and discriminant procedures. In the second phase, criterion validity was established by using Receiver-Operating Characteristic analysis (ROC). In the third phase, percentile norms were established and internal consistency was explored by item total correlation. Further reliability analysis was carried out.

Results: Correlation of Moral Disengagement scale for adolescent with Basic Empathy scale was inverse and significant ($p < 0.01$), while for

relational aggression and psychopathy was positive and significant ($p < 0.01$). The ROC area under the curve shown a value of .99 (95% confidence interval: .998 to 1.00) for Moral disengagement scale for adolescent and Moral disengagement scale by Bandura, which is considered as appropriate in discriminating the adjusted and non-adjusted cases. The values of correlation coefficient for subscales and total scale moral disengagement scale for adolescent are in appropriate range and highly significant ($p < 0.01$). Percentiles norms 50th percentile lies on score 61. So the cut off point for the current scale is 61.

Conclusions: Moral disengagement scale for adolescent is a valid and reliable measure. (Rawal Med J 202;45:323-326).

Keywords: Adolescents, Construct related evidences of validity, Moral Disengagement, Percentiles, Receiver-Operating Characteristic analysis.

INTRODUCTION

Moral disengagement is a course of influence that ethical values do not relate to oneself in a particular situation. The mechanisms of self-condemnation are disabled in this way by morally disengaged individuals. There are people who utilize the feelings of shame and guilt for character building, honesty, and matured closeness. While the rest use "moral disengagement" to refrain from guiltiness and embarrassment and keeping on behaving badly. These are social-cognitive mechanisms that let people to rationalize their deplorable and harmful acts to retain the self-image.¹ Bandura further explained that "mechanisms of moral disengagement" can arrange for ways to persuade their doer that those are acting ethically and they are in agreement with the values and ethics of their leaders.¹ Individuals disapprove and judge their acts compared to their self-formulated values and

contextual conditions, at that time they act in a manner that transfers them a perception of approval and pride.²

The moral standards which one adhere with do not function as a firm watchdog of moral behavior. Many psychosocial tactics are involved by which people selectively disengage ethical self-sanctions from cruel demeanor. These tactics further authorize them to do painful things with liberty, from the restraints of self-condemnation.³ The moral self-control mechanism can be disengaged. Selective initiation and detachment of self-approvals allow diverse sort of demeanor by individuals through the similar ethical values. People use diverse mechanisms to justify their morally disengaged acts.

Moral disengagement scale for adolescents was developed to check the level of moral disengagement in adolescents. It is a self-report

measure consisting of 24 item likert type scale with the response category of "Not at all agree", "very less agree", "Agree to some extent", "Agree" and "Always agree". All the items are worded positively with high scores showing high level of moral disengagement.⁴ The current study was conducted to validate the moral disengagement scale for adolescents.

METHODOLOGY

The study was conducted in the District of Gujrat, Pakistan. Target population was adolescents studying in educational institutes from age 12-19 years. Educational institutes were decided for selecting the sample because they encompass a huge variety of different segments of the population. Youngster from different areas, socioeconomic status and cultural backgrounds become together under a single roof. The multistage random sampling technique and random sampling technique were used.

Inclusion criteria comprised of the adolescents from age 12-19. Students under age 12 and above age 19, not studying in any educational institute, with any physical disability and diagnosed psychological problems which hinder them in responding were excluded from the study. The study was approved by the Advanced Studies and Research Board (ASRB) of the University. Permission was taken from the authorities of the different educational institutes and Informed consent was taken from all participants. The study was carried out in three phases: Phase I: Establishment of Construct validity, Phase II: Establishment of criterion validity of scale by using Receiver-Operating Characteristic analysis (ROC) and Phase III: Establishment of Percentile Norms.

Phase I: Establishment of Construct validity:

The construct validity was established by discriminant and convergent procedures. Moral disengagement is positively related to relational aggression^{5,6} and psychopathy^{7,8} while it is inversely linked with empathy.^{9,10} So Urdu version of scales on relational aggression, diverse adolescent relational aggression scale translated by Riaz,¹¹ psychopathy subscale of SD 3 and Basic empathy scale both translated by Gul-e-Sehar and Fatima¹² were implied for collecting convergent and discriminant

evidences.

Phase II: Establishment of criterion validity of scale by using Receiver-Operating Characteristic analysis (ROC): ROC analysis was used to find the optimal threshold score of the scale. Performance indices were measured against sensitivity, specificity, Positive Predictive Value (PPV) and Negative Predictive Value (NPV). All the performance indices were calculated using the best cut-off calculated by ROC analysis. Indigenously developed Moral disengagement scale for adolescents which is to be validated and moral disengagement scale for adolescents developed by Bandura¹⁴ was administered to 140 students.

Phase III: Establishment of Percentile Norms: In this phase of study percentiles norms were established. Sample of 1110 students was selected from different school and colleges of Gujrat, Sialkot, Kharian. Indigenously developed Moral disengagement scale for adolescents⁴ was administered.

RESULTS

The ROC area under the curve shown a value of .99 (95% confidence interval: .998 to 1.00) for Moral disengagement scale and Moral disengagement scale by Bandura which is considered as appropriate in discriminating the adjusted and non-adjusted cases (Figure).

Figure. ROC curve for the Moral Disengagement scale for Adolescents.

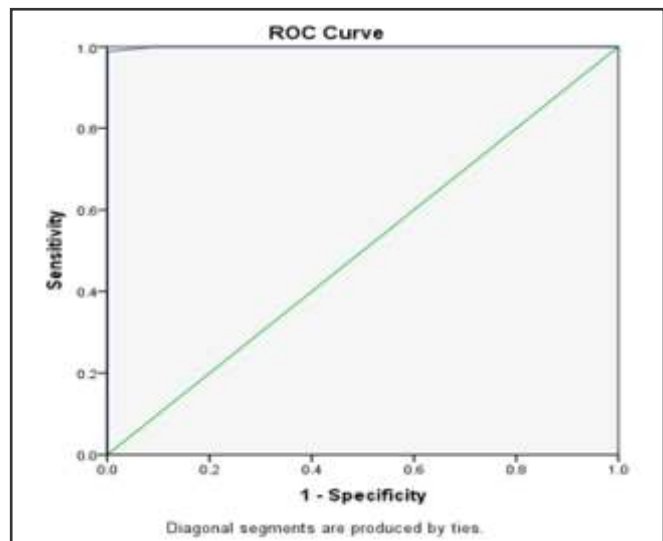


Table 1. Validity coefficient for Moral Disengagement Sale for Adolescents (N=140).

Cut off MD_DEV	Sensitivity %	Specificity %	Positive Predictive Value %	Negative predictive value %
38	88.07	20.00	96.00	7.14
40	81.65	40.00	96.74	9.09
42	73.39	60.00	97.56	9.38
44	69.72	60.00	97.44	8.33
46	64.22	60.00	97.22	7.14
48	60.55	60.00	97.06	6.52
50	52.29	60.00	96.61	5.45

Table 2. Percentiles for MDSA (N=1110).

Percentile	Score
5	34
10	37
25	48
50	61
75	73
90	84
95	91

Table 3. Correlation between subscales and total scale score (N=1110).

Subscale	Total items	Subscale correlation with total scale score
Displacement and diffusion of responsibility	6	.79**
Advantageous comparison	5	.75**
Dehumanization	4	.78**
Attribution of Blame	3	.72**
Moral Justification	3	.54**
Euphemistic Labeling	3	.65**

Table 1 indicates the validity coefficients for various thresholds for the MDSA. The cut-off point of 42 attained the high sensitivity and specificity. It can be concluded that the best discriminating performance of the MDSA acquired at the 42 cut-off point. It indicated that at the cut-off of 42, the MDSA correctly identifies 73.39% of adolescents with moral disengagement with the specificity of 60%. Percentiles for MDSA are shown in Table 2 and Correlation between subscales and total scale score is shown in Table 3. Cronbach alpha reliability of scale came out .88

DISCUSSION

The scale is comprehensible as it is in indigenously developed and in local language. Positive correlation exists between the moral disengagement scale for adolescents and diverse adolescent relational aggression scale and Psychopathy. For appropriate convergent validity, the correlation value must be in moderate range neither very high not low. Very low value is the indication of no relationship while a high correlational coefficient undermines the need of a new test. Value of 0.50 to 0.70 is considered appropriate.¹⁵ The value of convergent validity coefficient for psychopathy is in the recommended range while for relational aggression it is slightly low but highly significant. For discriminant validity, if there is little or no relation exist in the two constructs or there is inverse relationship it is evidence of discriminant validity.¹⁶ The basic empathy scale and moral disengagement scale for adolescents has inverse and highly significant correlation which is the evidence of discriminant validity of the scale.

The ROC analysis demonstrated that the area under the curve was 0.99. It was established that if the value of area under curve is in between 0.7 to 0.9 than the scale is at moderate level of accuracy¹⁷ and can be used in future. The ROC analysis confirmed that this scale is appropriate in discriminating the morally disengaged and not morally disengage adolescents. Further, the ROC curve of a good test is above the diagonal of the graph or towards the north-western corner of the graph.¹⁸ In the case of moral disengagement scale the curve is above the diagonal confirming the test as best.

To explore the usefulness of any test it is important to note the ability of the test in detecting an individual with the problem or exclusion of the individual without the problem. It can be discovered best with sensitivity, specificity, positive predictive value and negative predictive value.¹⁹ The study demonstrated that the optimal cut-off point of scale is 42 at the sensitivity of 73.39% and the specificity of 60%. At sensitivity of 73.39% the Positive Predicted Value (PPV) was 97.56 and Negative Predicted Value (NPV) of 9.38.

Percentile norms were established on the sample of 1110 adolescent students. 50th percentile lies on

score 61. So the cut off point for the current scale is 61. Correlation between the subscale and total scale scores of moral disengagement scale for adolescent ranges from .54 to .79 which is highly significant ($p < 0.01$). Alpha reliability coefficient of the scale is .88 which is good.

Limitations of study were that only three cities were taken for data collection so the percentile norms are not appropriate for the whole population. Furthermore, only adolescent students were included in the sample so the scale is for educated population only. Recommendation for future researcher are to expand the data collection in other cities of Pakistan and also use it for all adolescents including the illiterate adolescents.

CONCLUSION

Moral disengagement scale for adolescent is a valid measure and reliable measure.

Author contributions:

Conception and design: Saima Riaz, Zaqia Bano
Collection and assembly of data: Saima Riaz
Analysis and interpretation of the data: Saima Riaz, Zaqia Bano
Drafting of the article: Saima Riaz
Critical revision of the article for important intellectual content: Saima Riaz, Zaqia Bano
Statistical expertise: Saima Riaz, Zaqia Bano
Final approval and guarantor of the article: Zaqia Bano
Corresponding author email: Saima Riaz:
Saima.riaz@uog.edu.pk
Conflict of Interest: None declared
Rec. Date: Jun 27, 2019 Revision Rec. Date: Dec 6, 2019 Accept Date: Feb 16, 2020

REFERENCES

- Bandura A. Selective Moral Disengagement in the Exercise of Moral Agency. *J Moral Educ* 2002; 31:1-19.
- Cartledge S, Bowman-Grieve L, Palasinski M. The Mechanisms of moral disengagement in George W. Bush's "war on terror" rhetoric. *The Qualitative Report* 2015;20:1905-21.
- Bandura A. Moral disengagement: How people do harm and live with themselves. New York, USA: Worth publishers; 2016. p.50
- Riaz S, Bano Z. Development and psychometric properties of Moral Disengagement Scale for Adolescents. *Pak J Psychol* 2018;49:3-22.
- Kokkinos CM, Voulgaridou I, Mandrali M, Parousidou C. Interactive links between relational aggression, theory of mind, and moral disengagement among early adolescents. *Psychol Sch* 2016; 53:253-69.
- Orue I, Calvete E. Psychopathic traits and moral disengagement interact to predict bullying and cyberbullying among adolescents. *J Interpers Violence* 2016;56:1-11.
- Petrucelli I, Barbaranelli C, Costantino V, Gherardini A, Grilli S, Craparo G, et al. Moral Disengagement and Psychopathy: A Study on Offenders in Italian Jails. *Psychiatr Psychol Law* 2017;24:670-81.
- Dhingra k, Debowska A, Sharratt K, Hyland P, Kola-Palmer S. Psychopathy, gang membership, and moral disengagement among juvenile offenders. *J Crim Psychol* 2015;5:13-24.
- Gaelle O, Charlotte JS, De Backer, Heidi V. Online celebrity aggression: A combination of low empathy and high moral disengagement? The relationship between empathy and moral disengagement and adolescents' online celebrity aggression. *Comput Human Behav* 2018;89:61-9.
- Haddock AD, Jimerson SR. An Examination of Differences in Moral Disengagement and Empathy Among Bullying Participant Groups. *J Relatsh Res* 2017; 8. Available from <https://doi.org/10.1017/jrr.2017.15>.
- Riaz H. Impact of dysfunctional family system of externalizing behavior problems and mental health among adolescents. M Phil [Dissertation]. University of Sargodha, Sargodha; 2014.
- Gul-e-Sehar, Fatima I. Dark Triad Personality Traits as predictors of bullying and victimization in adolescents. *J Behav Sci* 2016;26:51.
- Lindsay G. Researching children's perspectives: Ethical issues. In: A. Lewis & G. Lindsay (Eds.), *Researching Children's Perspectives*. 2000 (pp. 3-20). Buckingham: Milton Keynes.
- Bandura A, Barbaranelli C, Caprara GV, Pastorelli C. Mechanisms of moral disengagement in the exercise of moral agency. *J Pers Soc Psychol* 1996;71:364-74.
- Carlson KD, Herdman AO. Understanding the Impact of Convergent Validity on Research Results. *Org Res Methods* 2012;15:17-32.
- Lund Research Limited 2012. "What is divergent validity?," viewed on 22 September 2018, <http://dissertation.laerd.com/convergent-and-divergent-validity-p2.php>.
- Streiner DL, Cairney, J. What's under the ROC? An introduction to Receiver Operating Characteristics Curves, *Can J Psychiatry* 2007;52:121-8.
- Pintea S, Moldovan R. The Receiver-Operating Characteristic (ROC) analysis: Fundamentals and applications in clinical psychology. *J Cogn Behav Psychother* 2009;9:49-66.
- Akobeng, AK Understanding diagnostic tests 1: sensitivity, specificity and predictive values. *Acta Paediatr* 2007;96:338-41.