

The Impact of Impulsivity and Risk Taking on Crime Categories among Children in conflict with Law

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ABSTRACT

This study aims to investigate the role of impulsivity and risk-taking in differentiating crime categories among children in conflict with law in India. The objective was to examine whether these psychological traits predict the severity of crimes and to contribute to a nuanced understanding of juvenile offending for designing effective rehabilitation strategies. A quantitative, cross-sectional design was employed with data collected from 150 male juveniles aged 14-18 residing in observation homes in Delhi, India. Impulsivity was measured using the Impulsiveness Scale (Rai & Sharma, 2013, Hindi version), and risk-taking was assessed with the Risk-Taking Inventory (Nimbalkar & Helode, 2017, Hindi version). Analyses included Welch's One-Way ANOVA and Multinomial Logistic Regression. The results indicated significant differences in impulsivity ($F(2,98.0)=13.9, p<.001$) and risk-taking ($F(2,94.9)=4.39, p=0.015$) across crime categories. Post hoc tests revealed that serious offenders showed lower impulsivity compared to petty and heinous offenders, while risk-taking was highest in petty crimes compared to the other two categories. Multinomial Logistic Regression Analyses confirmed impulsivity ($\chi^2(2)=26.1, p<.001$) and risk-taking ($\chi^2(2)=9.98, p=0.007$) as significant predictors of crime category. These findings demonstrate that impulsivity and risk-taking are critical psychological traits influencing juvenile criminal behavior. Incorporating these factors into juvenile justice assessments and interventions is essential. Tailored strategies focusing on impulse control and risk management may reduce recidivism and better support reintegration.

Keywords: *Impulsivity, Risk Taking, Juvenile Delinquency, Children in Conflict with the Law; Juvenile Justice System*

INTRODUCTION

A young boy stands before a juvenile justice board, eyes downcast, shoulders hunched as the weight of his actions hangs heavy in the air. Was his crime a calculated act or the product of impulse? The Indian juvenile justice system faces this dilemma every day, as children in conflict with the law await judgment. More often than not, these children are entangled in socio-economic adversity, family dysfunction, and exposure to violence at critical stages of development. (Sharma, R., & Kumar, A., 2023). While placement in an observation home offers a chance at rehabilitation, understanding what brought them there remains a daunting challenge.

Why does one child engage in petty theft while another commits heinous acts? Is it purely environmental or do psychological traits also play a defining role? For many juveniles, impulsivity and risk-taking are not minor quirks but central factors shaping decision-making. These traits distort judgment, weaken foresight, and heighten susceptibility to peers common vulnerabilities in adolescence (Steinberg, 2008).

Impulsivity is linked with poor self-control, emotional reactivity, and a tendency to pursue immediate rewards. Risk-taking, by contrast, involves actions under uncertainty, often driven by thrill-seeking. Research shows adolescents, especially in high-risk environments, demonstrate heightened impulsivity and risk-taking, which strongly correlate with delinquency (Lambert et al., 2013; Romer et al., 2017). Neurological studies confirm this vulnerability, linking adolescent impulsivity to underdeveloped executive functioning in the prefrontal cortex (Casey et al., 2008). Indian research, though limited, reflects similar trends: Khan (2023) found that juveniles in conflict with the law exhibit poor future orientation and high reactivity, intensifying their vulnerability to crime compared to peers in similar socio-economic conditions.

The Indian context adds unique challenges. Widespread poverty, rapid urbanization, and fragile family structures interact with limited psychological frameworks, leaving gaps in understanding adolescent offending. (UNICEF India., 2022) The Juvenile Justice (Care and Protection of Children) Act, 2015 classifies offenses as petty, serious, or heinous, shaping both legal proceedings and rehabilitation. (Juvenile Justice [Care and Protection of Children] Act, 2015, ss., 2(33), 2(45), 2(54)). Yet, little research examines how impulsivity and risk-taking vary across these categories. Identifying these behavioural patterns is essential for tailoring interventions to each child's psychological profile.

The tripartite classification of crime also carries global relevance, mirroring severity-based frameworks across legal systems. (United Nations Office on Drugs and Crime [UNODC], 2021) Such shared categorization enhances comparative criminology, cross-border dialogue, and international cooperation in justice systems.

Guided by Jessor's Problem Behavior Theory (Jessor, 1987), this study investigates the relationship between impulsivity, risk-taking, and crime category among boys in Indian observation homes. Its aim is to deepen understanding of juvenile offending and to inform rehabilitation strategies that address both psychological and socio-environmental factors, offering pathways toward meaningful reintegration.

Research has established that adolescents are more vulnerable to these traits due to developmental and neurological factors (Shulman et al., 2016). However, limited studies in the Indian context have systematically examined how these behaviours vary across crime categories, leaving a critical gap in tailoring interventions.

METHODOLOGY

The objective of this study is to investigate the relationship between impulsivity, risk-taking behavior, and crime category among boys residing in Indian observation homes, drawing on Jessor's Problem Behavior Theory (Jessor, 1987). It also aims to contribute to a deeper understanding of juvenile

offending in India and to inform the design of rehabilitation strategies that integrate psychological and socio-demographic factors for effective reintegration.

The following hypotheses were developed to be tested in the given study:

- H 1:** There will a significant difference in level of impulsivity across categories of crimes.
- H 2:** There will a significant difference in level of risk taking across categories of crimes.
- H 3:** Impulsivity will be a predictive factor for category of crime
- H 4:** Risk taking will be a predictive factor for category of crime

The study employed a quantitative, cross-sectional design using assessment tools in observation homes. Purposive sampling was used to collect data from Males aged between 14 and 18 years residing in Observation Homes of Delhi, India. The study sample comprised 150 participants, evenly distributed across three crime categories (Petty, Serious, and Heinous) i.e. 50 individuals in each category. Impulsivity was measured using the Impulsiveness Scale by S.N. Rai & Alka Sharma (Hindi Version) and risk taking behavior was measured using Risk-Taking Inventory by Dr. K.P. Nimbalkar & Dr. R.D. Helode (Hindi Version). All data were analyzed using the Jamovi Version 2.7.

Permissions were procured from the Women and Child Department (WCD) for access to children in conflict with law residing in observation homes in Delhi, India. Each child was given a briefed about the study and verbal consent was taken followed by a repo formation session followed by implementation of the tools.

RESULTS

Prior to testing the hypotheses, preliminary Shapiro -Wilk analyses were conducted to examine the distribution of the continuous variables, Impulsivity and Risk Taking. Followed by a robust One-Way ANOVA (Welch's F) conducted to test the differences in impulsivity (H₁) and risk taking (H₂) across categories of crime, followed by Multinomial Logistic Regression to assess the predictive ability of impulsivity (H₃) and risk taking (H₄) on the category of crime.

Table I
Shapiro -Wilk Tests of normality

Variable(s)	N	Median	Skewness	W	p
Impulsivity	150	15	0.0381	0.960	< .001 ***
Risk Taking	150	16	0.316	0.976	< .0011 **

Note. * p < .05, ** p < .01, *** p < .001

Figure I
Histogram Density Plot of Impulsivity

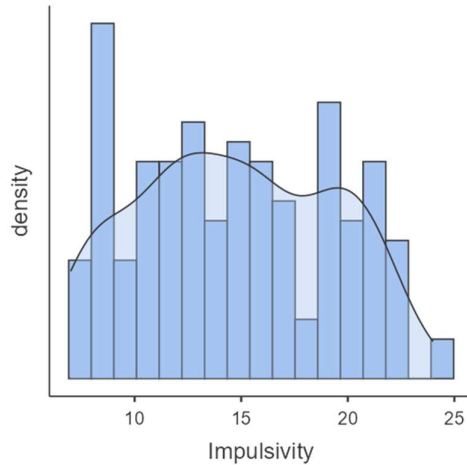
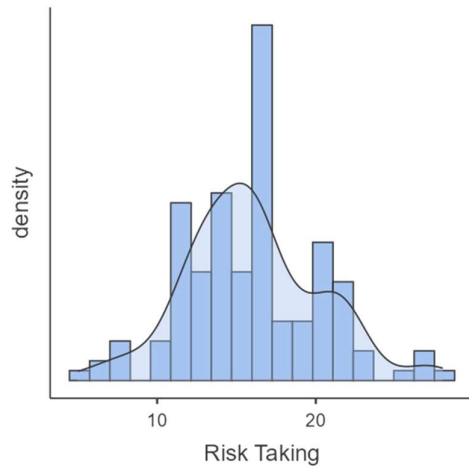


Figure II

Histogram Density Plot of Risk Taking



The Shapiro-Wilk tests for normality, presented in Table I, indicated that both Impulsivity ($W=0.960, p<.001$) and Risk Taking ($W=0.976, p<.001$) were statistically non-normal ($N=150$). However, visual inspection of the histogram density plots (Figure I and Figure II) supported that the distributions were approximately symmetric and not severely non-normal this taken together with the Central Limit Theorem (CLT) and the moderate sample size ($N=150$), the use of parametric tests was deemed appropriate, as they are robust to minor deviations from normality.

Table II

Welch's One-Way ANOVA of Impulsivity and Risk Taking across Category of Crime

Variable(s)	F	df1	df2	p
Impulsivity	13.9	2	98.0	<.001***
Risk Taking	4.39	2	94.9	0.015*

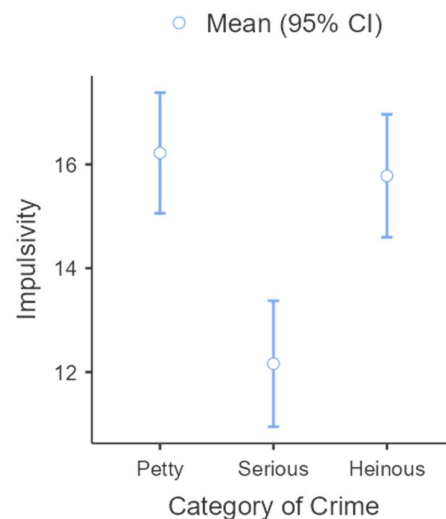
Note. * $p < .05$, ** $p < .01$, *** $p < .001$

A Welch's One-Way ANOVA was conducted to compare impulsivity scores across the categories of crime which indicated a statistically significant difference in impulsivity levels across the category of crimes, $F(2,98.0)=13.9, p<.001$. Thus, Hypothesis 1 (H_1) i.e. There will a significant difference in level of impulsivity across categories of crimes is accepted. Another Welch's One-Way ANOVA was conducted which indicated a statistically significant difference in risk taking scores across the categories of crime, $F(2,94.9)=4.39, p=0.015$. Thus, Hypothesis 2 (H_2) i.e. There will a significant difference in level of risk taking across categories of crimes is accepted.

Table III*Tukey Post-Hoc Test – Impulsivity*

Category of Crime		Petty	Serious	Heinous
Petty	Mean difference	—	4.06***	0.440
	p-value	—	<.001	0.858
Serious	Mean difference	—	—	-3.620***
	p-value	—	—	<.001
Heinous	Mean difference	—	—	—
	p-value	—	—	—

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Figure III*Descriptive Plot of impulsivity across category of crimes*

Post-hoc comparisons using the Tukey HSD test (Table III) showed that the mean impulsivity score for the Petty crime category was significantly higher than the Serious crime category (mean difference = 4.06, $p<.001$). There was no significant difference in impulsivity between the Petty and Heinous crime categories (mean difference = 0.440, $p=0.858$). The Serious crime category also had significantly lower impulsivity scores than the Heinous crime category (mean difference = -3.620, $p<.001$). As illustrated in Figure III, impulsivity was lowest in the serious crime category.

Table IV

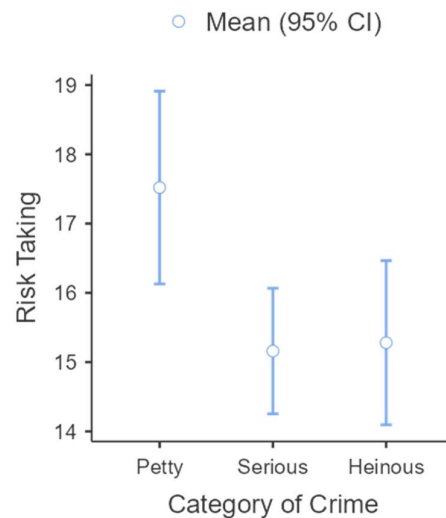
Tukey Post-Hoc Test – Risk Taking

Category of Crime		Petty	Serious	Heinous
Petty	Mean difference	—	2.36*	2.240*
	p-value	—	0.014	0.021
Serious	Mean difference		—	-0.120
	p-value		—	0.989
Heinous	Mean difference			—
	p-value			—

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Figure IV

Descriptive Plot of Risk-Taking across category of crimes



Post-hoc comparisons using the Tukey HSD test (Table IV) indicated that the mean risk taking score for the Petty crime category was significantly higher than both the Serious (mean difference = 2.36, $p=0.014$) and Heinous (mean difference = 2.240, $p=0.021$) crime categories. There was no statistically significant difference in risk taking between the Serious and Heinous crime categories (mean difference = -0.120 , $p=0.989$). Figure IV illustrates these descriptive differences.

Table V

Multinomial Logistic Regression Model Fit Measures for impulsivity and Risk Taking

Model	Deviance	AIC	R^2_N	Overall Model Test		
				χ^2	df	p

1	303	311	0.108	26.1	2	<.001 ***
2	320	328	0.0422	9.98	2	0.007**

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Note. Model 1 : Impulsivity , Model 2 : Risk Taking

The overall model (Model 1) containing Impulsivity as the predictor was statistically significant ($\chi^2(2)=26.1$, $p<.001$). The model's Nagelkerke R^2 was 0.108. The overall model (Model 2) containing Risk Taking as the predictor was statistically significant ($\chi^2(2)=9.98$, $p=0.007$). The model's Nagelkerke R^2 was 0.0422.

Table VI

Multinomial Logistic Regression Coefficients of Impulsivity across Category of Crime

Category of Crime	Predictor	Estimate	SE	Z	p
Serious - Petty	Intercept	3.2422	0.7821	4.146	<.001***
	Impulsivity	-0.2294	0.0534	-4.295	<.001***
Heinous - Petty	Intercept	0.3890	0.7796	0.499	0.618
	Impulsivity	-0.0243	0.0471	-0.516	0.606
Serious - Heinous	Intercept	2.8532	0.7562	3.773	<.001***
	Impulsivity	-0.2051	0.0524	-3.911	<.001***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

As shown in Table VI, Impulsivity was a significant predictor when comparing the Serious crime category to the Petty crime category ($Z=-4.295$, $p<.001$), with the negative coefficient (Estimate = -0.2294) suggesting that higher impulsivity is associated with a lower log-odds of being in the Serious crime category compared to the Petty crime category. Impulsivity was not a significant predictor when comparing the Heinous crime category to the Petty crime category ($Z=-0.516$, $p=0.606$). Finally, Impulsivity was a significant predictor when comparing the Serious crime category to the Heinous crime category ($Z=-3.911$, $p<.001$), with the negative coefficient (Estimate = -0.2051) indicating that higher impulsivity is associated with a lower log-odds of being in the Serious crime category compared to the Heinous crime category. Thus, Hypothesis 3 (H_3) i.e. Impulsivity will be a predictive factor for category of crimes is accepted.

Table VII

Multinomial Logistic Regression Coefficients of Risk Taking across Category of Crime

Category of Crime	Predictor	Estimate	SE	Z	p
Serious - Petty	Intercept	2.238	0.8546	2.62	0.009**
	Risk Taking	-0.137	0.0510	-2.69	0.007**
Heinous - Petty	Intercept	2.123	0.8518	2.49	0.013*
	Risk Taking	-0.130	0.0506	-2.56	0.010**
Serious - Heinous	Intercept	0.11505	0.7900	0.146	0.884

Category of Crime	Predictor	Estimate	SE	Z	p
	Risk Taking	-0.00756	0.0502	-0.151	0.880

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

As shown in Table VII, Risk Taking was a significant predictor when comparing the Serious crime category to the Petty crime category ($Z=-2.69$, $p=0.007$) and when comparing the Heinous crime category to the Petty crime category ($Z=-2.56$, $p=0.010$). The negative coefficients in both cases (Estimate = -0.137 and -0.130 , respectively) suggest that higher risk taking is associated with a lower log-odds of being in the Serious or Heinous crime category compared to the Petty crime category. Risk Taking was not a significant predictor when comparing the Serious crime category to the Heinous crime category ($Z=-0.151$, $p=0.880$). Thus, Hypothesis 4 (H_4) i.e. Risk taking will be a predictive factor for category of crime is accepted.

DISCUSSION

This study explores the relationship between impulsivity, risk-taking, and crime categories. The findings reveal significant variations across crime categories, offering insights into the psychological basis of delinquency.

These outcomes resonate with existing literature emphasizing impulsivity as a robust correlate of offending and externalizing behavior (Zimmerman, 2009). Zimmerman's framework underscores that impulsivity operates not in isolation but through interactions with environmental and situational contexts—a "trait $\times$ context" model that aligns with the variation observed across petty, serious, and heinous offenses. Recent research by Fantin et al. (2024) similarly demonstrates that impulsiveness can mediate the pathway from substance use to criminal behavior, amplifying legal involvement and behavioral disinhibition.

The predictive role of impulsivity observed here is also consistent with the General Theory of Crime, which conceptualizes low self-control as the central antecedent of delinquent behavior. Yet, this study extends that model by showing that impulsivity appears more proximal to immediate offending behavior, whereas risk-taking may be a broader dispositional trait requiring specific situational triggers (Dhami & Mandel, 2012). The "crime as risk-taking" perspective supports this, viewing criminal decisions as calculated trade-offs between potential rewards and perceived risks a mechanism evident in the inverse relationship found in this study, where higher risk-taking specifically characterized less severe, petty offenses rather than escalating with crime severity.

Neuropsychological evidence strengthens this interpretation. Syngelaki et al. (2009) report that violent offenders often display deficits in executive control and prefrontal cortical functioning, which are associated with impulsive, disadvantageous decision-making patterns. Similarly, Wang et al. (2024) identify distinct impulsivity subtypes across forms of violence, suggesting that impulsivity is not a uniform construct but a multifaceted one linked differently to crime types. These neurocognitive findings provide a biological substrate for the behavioral distinctions observed here, wherein impulsivity showed stronger predictive power than general risk-taking.

From an interpretive standpoint, petty crimes may be driven largely by situational impulsivity, opportunistic actions with minimal foresight—while serious or heinous crimes might involve greater planning, intent, and moral disengagement. This gradation reflects a shift from reactive to instrumental offending, where the influence of raw impulsivity diminishes as cognitive mediation and social learning increase. (Hydler, 2020).

The weaker differentiation of risk-taking across serious and heinous categories further suggests that structural and contextual variables (e.g., opportunity, social modeling, environmental pressures) moderate the relationship between risk propensity and actual offending behavior.

Finally, the modest effect sizes (R^2 values) observed indicate that while impulsivity and risk-taking contribute meaningfully to differentiating crime severity, they are far from exhaustive explanatory variables. Psychological constructs such as moral reasoning, criminal cognition, and empathy, as well as contextual factors like co-offending networks, socioeconomic strain, and exposure to violence, likely play critical mediating roles.

For instance, Cen et al. (2025) found that moral disengagement and distorted criminal cognition distinctly influence risk-taking tendencies among violent and non-violent offenders, suggesting a layered interaction between cognitive, emotional, and contextual factors in predicting offense type.

CONCLUSION

In sum, this study demonstrates that impulsivity and risk taking are significantly associated with differences in crime categories and modestly predictive of crime category with impulsivity showing a stronger and more consistent role. The elevated impulsivity and risk taking observed in petty offenders suggest that early intervention targeting impulse control and decision processing could help prevent escalation and different type of intervention might benefit individuals at different levels.

Practically, the pattern suggests two complementary prevention and assessment strategies: first, early interventions that target self-control and executive functions (to reduce impulsive reactivity and momentary risk taking) are likely to be most useful for preventing or reducing petty offending (Diamond, 2011; Rieser et al., 2019).

Second, assessment protocols for serious and heinous offending should go beyond broad impulsivity or general risk indices and include measures of planning/premeditation, psychopathic traits, substance use, prior criminal experience, and co-offending networks (Azevedo et al., 2020; Barra et al., 2022; Defoe et al., 2021) because impulsivity explained more variance than risk taking in the present models (Model 1 $R^2 \approx .108$ vs. Model 2 $R^2 \approx .042$), screening and brief cognitive-behavioral or executive-function interventions (e.g., inhibitory control training, mindfulness, structured skills programs) may yield more immediate impact in populations at risk for low-severity, opportunistic offending (Diamond, 2011; Rieser et al., 2019).

Limitations and Future Directions

Several cautions and clear next steps follow: (a) the multinomial models explain a modest fraction of variance (Nagelkerke $R^2 \approx .11$ for impulsivity, $\approx .04$ for risk taking), so impulsivity and risk taking are important but partial contributors — future work should integrate multi-level predictors (psychopathy, substance problems, social networks, opportunity structures) to improve explanatory power (Barra et al., 2022; Goodley et al., 2022). Cross-sectional design prevents causal claims longitudinal, prospective studies are needed to test whether impulsivity and risk taking predict escalation or desistence across criminal careers (Rieser et al., 2019; Defoe et al., 2021). (c) Measurement breadth matters: using multidimensional impulsivity measures (attentional, motor, non-planning) and domain-specific risk tasks (behavioral lab tasks plus real-world indices) will sharpen inference about which facets drive different offences (Rieser et al., 2019; Shulman et al., 2015). (d) Finally, intervention research should test whether executive-function and impulse-regulation programs reduce petty offending and whether different treatment emphases (e.g., planning/problem solving vs. inhibition

training) are needed for higher severity offenders (Diamond, 2011; Barra et al., 2022). Together these steps would clarify mechanisms, improve prediction, and guide tailored prevention and rehabilitation.

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