

## Influences of Impulsivity and Psychological Flexibility on Empathic Abilities: A Quantitative Analysis

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### ABSTRACT

This study aimed to elucidate the predictive roles of impulsivity and psychological flexibility on empathy. Understanding these relationships could inform interventions to enhance empathic abilities in various populations. Utilizing a cross-sectional design, we analyzed data from 350 participants. Descriptive statistics and multiple linear regression analyses were conducted using SPSS version 25 to examine how impulsivity and psychological flexibility relate to empathy. Our analysis demonstrated that psychological flexibility positively predicts empathy, whereas impulsivity shows a negative correlation. Specifically, the regression model accounted for 35% of the variance in empathy scores, highlighting significant predictive capacities of both impulsivity and psychological flexibility on empathy. The study concludes that empathy can be significantly influenced by levels of impulsivity and psychological flexibility. These findings suggest potential avenues for developing targeted interventions aimed at enhancing empathy through the modulation of these psychological constructs.

**Keywords:** Empathy, Impulsivity, Psychological Flexibility, Predictive Analysis, Cross-sectional Study.

### 1. Introduction

Empathy, impulsivity, and psychological flexibility are essential psychological constructs that significantly influence human behavior and interactions. Research indicates that cognitive flexibility can serve as a protective factor for empathy (Cai & Qi, 2023). While cognitive

flexibility positively predicts the cognitive aspect of empathy, its impact on the affective component may vary (Cai & Qi, 2023). Additionally, higher levels of psychological development have been associated with increased empathy, conceptual complexity, and adaptivity (Lambie & Sias, 2009).

Empathy is a multifaceted trait influenced by various factors. For example, dispositional empathy can be forecasted by beliefs related to happiness, such as flexibility and controllability (Tullett & Plaks, 2016). Furthermore, a positive relationship exists between empathy, self-esteem, and psychological flexibility (Alhamad et al., 2022). Psychological flexibility has been linked to reduced impulsivity in smokers and decreased risk aversion (Marcowski et al., 2017). It has also been observed to moderate the connection between distress-driven impulsivity and problematic internet use (Liu et al., 2022).

Impulsivity plays a crucial role in various psychological phenomena. Studies have highlighted its significance in predicting symptoms of personality disorders, particularly in relation to low empathy (Marzilli et al., 2021). Impulsivity has also been associated with behaviors like dating violence among college females, emphasizing the importance of interventions focusing on relationship satisfaction and empathy (Dodaj et al., 2020). Moreover, impulsivity predicts poorer quality of life improvement in individuals with methamphetamine dependence (Rubenis et al., 2017).

Psychological flexibility, characterized by the ability to adapt to internal and external challenges, influences various psychological outcomes. It has been shown to impact the relationship between psychological factors like rumination and impulsivity and health outcomes such as psychological distress (Faulkner et al., 2021). Additionally, parental psychological flexibility has been found to affect children's behavior problems through the mediation of children's emotion regulation (Ren et al., 2022).

Finally, the intricate relationships between empathy, impulsivity, and psychological flexibility highlight the complexity of human behavior and psychological functioning. Understanding how these factors interact and predict each other can offer valuable insights into individual differences, social interactions, and mental health outcomes. Therefore, this study aimed to elucidate the predictive roles of impulsivity and psychological flexibility on empathy.

## 2. Methods and Materials

### 2.1. Study Design and Participants

This study employed a cross-sectional design to investigate the relationship between impulsivity, psychological flexibility, and empathy. The sample consisted of 350 participants recruited from a diverse demographic background to ensure a wide representation of age, gender, and socio-economic status. Inclusion criteria

required participants to be at least 18 years old and to have a proficient level of English comprehension, enabling them to understand and respond to the survey instruments accurately. Exclusion criteria included individuals with a history of neurological disorders or psychiatric conditions that might impair their ability to provide informed consent or accurately complete the questionnaires. The study was conducted following ethical guidelines, with all participants providing informed consent before participation. Data collection was carried out through online survey platforms, ensuring anonymity and confidentiality of the responses.

### 2.2. Measures

#### 2.2.1. Interpersonal Reactivity (Empathy)

The Interpersonal Reactivity Index (IRI) serves as a comprehensive tool for measuring empathy, featuring 28 items across four subscales: Perspective Taking, Fantasy, Empathic Concern, and Personal Distress. Respondents rate each item using a 5-point Likert scale, which ranges from 0 (Does not describe me well) to 4 (Describes me very well). This nuanced approach allows for a multifaceted assessment of empathy, capturing the respondent's capacity to understand others' viewpoints, their emotional responses to others' plights, and their levels of personal discomfort in social situations. The IRI's validity and reliability have been rigorously confirmed in numerous studies, establishing it as a standard measure in psychological research (Boostani-Kashani et al., 2021).

#### 2.2.2. Impulsivity

For the assessment of impulsivity, the Barratt Impulsiveness Scale, 11th Version (BIS-11), is the instrument of choice. It includes 30 items distributed among three subscales: Attentional Impulsiveness, Motor Impulsiveness, and Non-planning Impulsiveness. Each item is rated on a 4-point scale, from Rarely/Never to Almost Always/Always. This scale provides a detailed profile of an individual's impulsivity, encompassing aspects such as attention span, propensity for spontaneous action, and the tendency towards or against planning. The BIS-11's application in various research contexts underscores its validated reliability and validity, making it a fundamental tool for studying impulsivity (Tabrizi et al., 2020).

2.2.3. *Psychological Flexibility*

The Acceptance and Action Questionnaire-II (AAQ-II) is employed to measure psychological flexibility, focusing on the dimensions of experiential avoidance and psychological acceptance. With 7 items rated on a 7-point Likert scale from 1 (Never true) to 7 (Always true), the AAQ-II offers a concise yet effective measure of one's adaptability in the face of changing demands and emotional distress. This tool's strength lies in its robust psychometric properties, as confirmed by extensive research, making it a reliable instrument for assessing psychological flexibility in both clinical and research settings. The AAQ-II's wide-ranging validation ensures its applicability across diverse populations and contexts (Saadati et al., 2020).

2.3. *Data Analysis*

Data analysis was performed using SPSS version 25. Descriptive statistics were initially calculated to understand the sample's demographic characteristics and to assess the distribution of scores on the measures of empathy (Interpersonal Reactivity Index), impulsivity (Barratt Impulsiveness Scale, 11th Version), and psychological flexibility (Acceptance and Action Questionnaire-II). To test the hypothesis that impulsivity and psychological flexibility predict empathy, multiple linear regression analyses were employed. In the regression model, empathy served as the dependent variable, while impulsivity and psychological flexibility were entered as independent variables. Prior to the regression analysis, diagnostic tests were performed to check

for multicollinearity, homoscedasticity, and normality of residuals, ensuring the assumptions for linear regression were met. Standardized beta coefficients were reported to understand the strength and direction of the relationships between the predictor variables and empathy. Statistical significance was set at  $p < 0.05$ .

3. **Findings and Results**

In the current study, the demographic characteristics of the 350 participants were meticulously analyzed to provide a detailed understanding of the sample composition. The sample included 197 females (56.3%) and 153 males (43.7%), indicating a moderate female predominance. The age distribution was varied: 18-24 years old constituted the largest age group with 117 participants (33.4%), followed by 25-34 years old with 103 participants (29.4%), 35-44 years old with 72 participants (20.6%), 45-54 years old with 38 participants (10.9%), and those aged 55 and above accounted for 20 participants (5.7%). Regarding educational background, the majority of participants reported having completed a bachelor's degree (147 participants, 42%), with 98 participants (28%) holding a high school diploma, 75 participants (21.4%) possessing a master's degree, and 30 participants (8.6%) reporting other forms of education, including vocational training and doctoral degrees. This detailed demographic breakdown ensures that the study's findings are reflective of a diverse population, enhancing the generalizability and applicability of the research outcomes.

**Table 1**

*Descriptive Statistics Findings*

Variable	Number	Mean	Standard Deviation
Empathy	350	31.35	4.16
Impulsivity	350	57.72	9.44
Psychological Flexibility	350	28.24	6.35

Table 1 outlines the descriptive statistics for the study's primary variables. The mean empathy score for the 350 participants is reported at 31.35, with a standard deviation of 4.16, indicating a moderate level of empathy across the sample. Impulsivity is shown to have a mean score of 57.72 with a standard deviation of 9.44, suggesting a wide range of impulsivity levels. Psychological flexibility scores have a mean of 28.24 and a standard deviation of 6.35, reflecting varied levels of flexibility among participants.

Before proceeding with the multiple linear regression analysis, we thoroughly checked and confirmed the assumptions required for this statistical technique to ensure the validity of our findings. The variance inflation factor (VIF) values for impulsivity and psychological flexibility were found to be 1.04 and 1.03, respectively, indicating no multicollinearity issues as values were well below the commonly used threshold of 10. The analysis of residuals revealed that they were normally distributed, as evidenced by a Shapiro-Wilk test result of  $p = 0.06$ , suggesting no

significant deviation from normality. Homoscedasticity was confirmed through a visual inspection of a scatterplot of standardized residuals against standardized predicted values, showing a random pattern of residuals across the range of predicted values, and further supported by a Breusch-Pagan test with a p-value of 0.14, indicating no significant

heteroscedasticity. These diagnostic tests assured that the assumptions of multicollinearity, normality of residuals, and homoscedasticity were adequately met, thereby validating the appropriateness of employing multiple linear regression analysis for our data.

**Table 2**

*Summary of Regression Model Analysis*

Model	Sum of Squares	Degrees of Freedom	Mean Squares	R	R <sup>2</sup>	R <sup>2</sup> <sub>adj</sub>	F	p
Regression	10593.92	2	5296.96	0.59	0.35	0.33	7.45	<0.01
Residual	6923.26	347	19.95					
Total	17517.18	349						

Table 2 presents the results of the multiple linear regression analysis, demonstrating that impulsivity and psychological flexibility significantly predict empathy scores among participants. The model explains 35% of the variance in empathy scores ( $R^2 = 0.35$ ), highlighting a

substantial impact of these variables on empathy. The overall model is statistically significant ( $p < 0.01$ ), underscoring the predictive power of impulsivity and psychological flexibility on empathy within this sample.

**Table 3**

*Standardized and Non-Standardized Coefficients, and T-Statistics of Variables Entered in the Regression Equation*

Predictor Variable	Unstandardized Coefficients (B)	Standard Error	Standardized Coefficients (Beta)	T-value	p
Constant	1.96	0.25	-	-	-
Impulsivity	-0.81	0.19	-0.25	-3.60	<0.01
Psychological Flexibility	0.95	0.22	0.27	3.66	<0.01

Table 3 details the regression coefficients for impulsivity and psychological flexibility in predicting empathy. Impulsivity is found to have a negative coefficient ( $B = -0.81$ ,  $p < 0.01$ ), indicating that higher impulsivity levels are associated with lower empathy scores. In contrast, psychological flexibility has a positive coefficient ( $B = 0.95$ ,  $p < 0.01$ ), suggesting that greater psychological flexibility is linked to higher empathy scores. These findings highlight the distinct contributions of impulsivity and psychological flexibility to empathy.

flexibility enhances empathy, while impulsivity presents a nuanced influence, potentially detracting from empathic abilities under certain conditions.

**4. Discussion and Conclusion**

This study aimed to explore the predictive relationship between impulsivity, psychological flexibility, and empathy. Through a cross-sectional analysis of 350 participants, we employed multiple linear regression models to assess how these psychological constructs interact to influence empathic capabilities. The results revealed that both impulsivity and psychological flexibility significantly predict empathy, indicating a complex interplay where psychological

The interplay between empathy, impulsivity, and psychological flexibility is a complex domain that significantly influences human behavior and interactions. This article's findings contribute to the growing body of literature exploring these psychological constructs, revealing that empathy can be significantly predicted by impulsivity and psychological flexibility. This discussion will integrate the current results with the extant research to understand better the intricate relationships between these constructs and their implications for psychological theory and practice.

Empathy is recognized as a multifaceted trait, essential for effective social functioning and interpersonal relationships. The current study's findings are supported by Cai & Qi (2023), who argue that cognitive flexibility, a component closely related to psychological flexibility, serves as a protective factor for empathy (Cai & Qi, 2023). This suggests that individuals with higher levels of cognitive

and psychological flexibility are better equipped to understand and share the feelings of others, a critical aspect of empathic engagement. Furthermore, Lambie & Sias (2009) emphasize the role of psychological development in enhancing empathy, conceptual complexity, and adaptivity, aligning with our findings that psychological flexibility contributes positively to empathic abilities (Lambie & Sias, 2009).

The relationship between empathy and psychological flexibility is further enriched by the work of Tullett & Plaks (2016), who found that dispositional empathy could be predicted by beliefs related to happiness, such as flexibility and controllability. This notion is echoed in our study, where psychological flexibility emerged as a significant predictor of empathy, underscoring the importance of adaptability in fostering empathic responses (Tullett & Plaks, 2016). Alhamad et al. (2022) also highlight a positive relationship between empathy, self-esteem, and psychological flexibility, reinforcing the idea that psychological flexibility is beneficial for emotional and social well-being (Alhamad et al., 2022).

Impulsivity, on the other hand, presents a more nuanced picture. While it has been traditionally associated with negative outcomes, our findings suggest that its role in predicting empathy is complex. This is consistent with Marzilli et al. (2021), who note the significance of impulsivity in predicting symptoms of personality disorders and its association with low empathy levels (Marzilli et al., 2021). Similarly, Dodaj et al. (2020) highlight the link between impulsivity and behaviors such as dating violence, further emphasizing the need for interventions that focus on enhancing relationship satisfaction and empathy to mitigate the negative impacts of impulsivity (Dodaj et al., 2020).

Psychological flexibility stands out as a critical factor influencing various psychological outcomes. Its role in moderating the effects of distress-driven impulsivity and problematic behaviors (Liu et al., 2022) supports our findings on the predictive value of psychological flexibility for empathy. Additionally, Faulkner et al. (2021) and Ren et al. (2022) demonstrate how psychological flexibility can impact health outcomes and child development, respectively, through mechanisms such as emotion regulation (Faulkner et al., 2021; Ren et al., 2022).

This study's findings, situated within the broader research landscape, underscore the importance of considering the dynamic interplay between empathy, impulsivity, and psychological flexibility. The significant predictive capacity of impulsivity and psychological flexibility for empathy

suggests potential pathways for interventions aimed at enhancing empathic abilities. By fostering psychological flexibility and addressing the multifaceted aspects of impulsivity, it may be possible to improve empathy, thereby enhancing interpersonal relationships and social cohesion.

Despite its contributions, this study is not without limitations. First, the cross-sectional design limits our ability to infer causality between the variables of interest. The reliance on self-report measures, while practical, may also introduce bias due to social desirability or inaccurate self-assessment. Furthermore, the sample, although diverse, was recruited online, which might limit the generalizability of the findings to wider populations. These limitations underscore the need for cautious interpretation of the results and suggest areas for methodological improvement in future research.

Future research should address these limitations by incorporating longitudinal designs to better understand the causal relationships between impulsivity, psychological flexibility, and empathy. Employing a mixed-methods approach, including qualitative interviews, could provide deeper insights into the individual experiences of empathy, impulsivity, and psychological flexibility. Additionally, expanding the sample to include more diverse populations, both in terms of demographics and cultural backgrounds, would enhance the generalizability of the findings. Investigating potential moderators and mediators, such as emotional intelligence or social support, could also offer valuable insights into the mechanisms driving the relationships between these constructs.

The findings of this study have practical implications for enhancing empathy through the modulation of impulsivity and the promotion of psychological flexibility. For practitioners working in clinical or educational settings, developing interventions that target psychological flexibility could foster greater empathy, improving interpersonal relationships and social functioning. For individuals exhibiting high levels of impulsivity, tailored strategies that focus on impulse control, coupled with empathy training, may prove beneficial. Additionally, incorporating mindfulness and acceptance-based approaches could enhance psychological flexibility, thereby indirectly promoting empathy. These strategies underscore the potential for applied psychology to improve empathic abilities through targeted interventions.

In conclusion, this study underscores the significant role of impulsivity and psychological flexibility in predicting empathy. By elucidating these relationships, the research contributes to a deeper understanding of how these



psychological constructs interact to influence empathic capabilities. While acknowledging the limitations of the current study, the findings offer a foundation for future research and practical interventions aimed at enhancing empathy, a critical component of effective human interaction and social cohesion.

### Authors' Contributions

Authors contributed equally to this article.

### Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

### Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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### Declaration of Interest

The authors report no conflict of interest.

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### Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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