

## Extended Abstract

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## Research paper

### **The Effectiveness of Multisystemic Therapy on Interpersonal Reactivity in Adolescent Girls with Psychopathic Traits**

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## Introduction

Psychopathy is a major construct in developmental psychology and psychopathology and is characterized by persistent patterns of disregard for others' rights, aggression, violation of social norms, and irresponsibility, all of which are associated with substantial negative consequences for both individuals and society (Burghart et al., 2024; Maurer et al., 2024). The prevalence of psychopathic behaviors in adolescents has been estimated to range from 6% to 20% (Sanz-García et al., 2022). In adolescent girls, these behaviors are more likely to manifest as interpersonal conflicts, emotional dysregulation, and impulsive reactions (Pinheiro et al., 2024).

A key construct related to psychopathy is interpersonal reactivity, which encompasses perspective-taking, fantasy, empathic concern, and personal distress (Davis, 1983). These dimensions play a critical role in social adjustment and the quality of interpersonal relationships (Silk et al., 2020; Li & Wang, 2021). Adolescents with psychopathic tendencies often exhibit deficits in emotion regulation and empathy, which may result in hostile, detached, or callous interpersonal behaviors (Olderbak et al., 2020). Examining interpersonal reactivity, therefore, provides valuable insight into the emotional and cognitive mechanisms underlying psychopathic traits.

Among evidence-based interventions, Multisystemic Therapy (MST) - a family- and community-based approach - has demonstrated substantial effectiveness in reducing behavioral problems among adolescents (Little et al., 2021; Bjørknes et al., 2024). MST targets multiple interacting systems (family, peers, school, and community) and has been shown to reduce recidivism and conduct-related symptoms while promoting prosocial behavior and future-oriented thinking (Conroy, 2020; Satodiya et al., 2024). However, despite its demonstrated efficacy, MST has been

relatively underexplored in female adolescents with psychopathic traits. Given that girls with secondary psychopathy often display heightened behavioral maladjustment and impulsivity, investigating the effects of MST on their interpersonal reactivity may contribute meaningfully to both theoretical understanding and clinical practice

## Method

This quasi-experimental study employed a pretest–posttest–follow-up design with a control group. The statistical population consisted of female students enrolled in four public high schools and vocational schools in Karaj during 2024. From a total of 520 tenth- and eleventh-grade students, 24 participants were selected based on obtaining a score of 27 or higher on the Levenson Self-Report Psychopathy Scale (LSRPS), along with confirmation from school staff. Participants were randomly assigned to experimental and control groups ( $n = 12$  per group)

Inclusion criteria included: female gender, age between 15 and 18 years, enrollment in grades 10 or 11, and provision of informed consent. Exclusion criteria were the presence of chronic psychiatric or medical conditions, absence from more than three intervention sessions, or simultaneous participation in other therapeutic services. Following attrition, each group consisted of 10 participants.

Psychopathic traits were assessed using the LSRPS, which includes 26 items measuring primary and secondary psychopathy (Levenson et al., 1995; Gholāmi et al., 2022). Interpersonal reactivity was measured using the Interpersonal Reactivity Index (IRI), a 28-item instrument assessing fantasy, empathic concern, perspective-taking, and personal distress (Davis, 1983; Hosseinverdi et al., 2020). Both instruments have demonstrated satisfactory validity and reliability in national and international studies.

The MST intervention was implemented based on Henggeler’s (1999) original framework and its localized adaptation by Amirkhānloo et al. (2022). The program consisted of twelve 90-minute sessions for adolescents, one psychoeducational session for parents, and one session for school staff. Assessments were conducted at pretest, posttest, and at a two-month follow-up for both groups. Data were analyzed using repeated-measures (mixed) ANOVA and Bonferroni post-hoc tests in SPSS version 27.

## Results

The mean age ( $\pm$  SD) of participants in the MST and control groups was  $15.80 \pm 0.79$  and  $16.20 \pm 0.42$  years, respectively, with no statistically significant difference between groups ( $F = 2.63$ ,  $p > .05$ ). Chi-square analysis also indicated no significant difference in grade distribution between the groups ( $p > .05$ )

**Table 1.** Frequency and Percentage of Grade Distribution in MST and Control Groups

	Grade MST (n=10)	Control (n=10)	$\chi^2$ (p)
10th	8 (80%)	10 (100%)	

	Grade MST (n=10)	Control (n=10)	$\chi^2$ (p)
11th	2 (20%)	0 (0%)	2.30 (.32)
Total	10 (100%)	10 (100%)	

Repeated-measures ANOVA revealed a significant main effect of MST on overall interpersonal reactivity ( $p < .05$ ). Subscale analyses indicated significant improvements in personal distress and fantasy in the experimental group, whereas changes in perspective-taking and empathic concern were not statistically significant. Bonferroni post-hoc comparisons demonstrated significant differences between pretest and posttest, as well as between pretest and follow-up, but not between posttest and follow-up, indicating the stability of treatment effects over the two-month follow-up period.

**Table 2. Results of repeated-measures ANOVA for interpersonal reactivity and subscales**

Variable	Source	F	P	$\eta^2$	Power
Personal distress	Group	27.59	<0.01	.60	.99
Fantasy	Group×Time	5.79	0.007	.24	.84
Perspective-taking	Time	3.52	0.04	.16	.62
Empathy	Group	1.20	0.01	.09	.18
Total reactivity	Time	4.81	<0.01	.21	.76

Overall, the findings indicate that MST significantly enhanced interpersonal reactivity in adolescent girls with psychopathic traits, with effects maintained at follow-up

## Discussion and Conclusion

The present study demonstrated that MST significantly improved interpersonal reactivity in adolescent girls with psychopathic traits, and these improvements were sustained over the follow-up period. Consistent with previous research (Hosseini-Fayāz, 2024; Ribeiro da Silva, 2023), the findings suggest that multidimensional, family-based interventions integrating cognitive restructuring, emotion regulation strategies, and strengthened family–school collaboration can effectively enhance adolescents’ social and emotional functioning. The absence of significant changes in perspective-taking and empathic concern may reflect the relative stability of these traits or indicate the need for longer or more intensive interventions targeting empathic development.

Overall, MST’s comprehensive focus on individual, familial, and educational systems makes it a particularly suitable approach for addressing psychopathic traits and promoting social adjustment

in adolescents. The study limitations include the restricted sample (female students in grades 10–11 from Karaj) and the relatively short follow-up period. Future research should examine more diverse populations, include male participants, and employ longer follow-up intervals to better assess the durability of treatment effects.

## **Ethical Considerations**

### **Ethical Code**

This study was conducted in accordance with ethical standards for research involving human participants. All participants and their legal guardians provided informed consent, and confidentiality of personal information was strictly maintained. Permission to conduct the study was obtained from the Karaj Department of Education, and ethical approval was granted by the Ethics Committee of Islamic Āzād University, Rasht (Ethics Code: IR.IAU.RASHT.REC.1403.025)

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### **Authors' Contributions**

Mahnaz Shahbāzpour contributed to data collection, intervention implementation, statistical analysis, and manuscript drafting. Seyedeh Maryam Mousavi (corresponding author) supervised the research process and revised the manuscript. Samere Asadi Majre served as academic advisor and contributed to manuscript review and editing. All authors approved the final version of the manuscript.

### **Conflicts of Interest**

The authors declare no conflicts of interest.

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