

## Childhood adverse experiences, cognitive flexibility and goal orientation in adolescents

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### Abstract

To investigate correlation among childhood adverse experiences, cognitive flexibility, and goal orientation in adolescents, a cross-sectional study was conducted at the Riphah International University, Lahore, Pakistan, from July 2021 to March 2022, while data was collected from students of both private and government schools/colleges of Lahore. Non-Probability Purposive Sampling was carried out to recruit the sample of 250 participants, within the age range of 15-18 years. Sample size was determined by G Power Analysis and Greens Formula by Kang H (2021). Adverse Childhood Experience Scale, Cognitive Flexibility Scale, and Achievement Goal Questionnaire were used as tools for data collection. Data was analysed in SPSS version 21, using descriptive analysis, independent sample t-test, Pearson Product Moment Correlation and Multiple Regression Analysis. Results showed significant difference among males and females, results also revealed significant correlation among childhood adverse experiences, cognitive flexibility, and goal orientation in adolescents. It was also noted that childhood adverse experiences and cognitive flexibility are good predictors of goal orientation in adolescents. It was concluded that early adversity can negatively affect goal orientation and cognitive flexibility, whereas cognitive flexibility positively affects goal orientation in adolescents. It is also worth noting that females have complex cognitive flexibility which enhances their goal orientation as compared to males, in spite of their childhood adverse experience.

**Keywords:** Childhood adverse experiences, Cognitive flexibility, Goal orientation and Adolescents.

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### Introduction

<sup>1</sup>Adolescence is a key stage of life for establishing healthy behaviour, attitudes, and lifestyle. It is a crucial time of learning, defining long-term objectives, personal aspirations and adjusting to a variety of physical, cognitive,

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and emotional changes. The purpose of the present study is to explore the association among childhood adverse experiences, cognitive flexibility, and goal orientation in adolescents.

Any exposure to abuse (emotional, physical, sexual), neglect (emotional, physical), and/or family dysfunction (parental separation/divorce, family member with mental illness and/or substance misuse, domestic violence, family member incarcerated) during the period of a child's growth is classified as childhood adversity. Childhood adverse experiences have a profound impact on the lives of adolescents, as they intensely affect thoughts, cognitions, goal orientations, self-esteem, and overall physical and psychological well-being of a growing child.<sup>1</sup>

The notion of cognitive flexibility has been defined by Martin and Rubin (1995) as one's knowledge of suitable choices for novel circumstances, adjusting to new situations, and being willing to be flexible.<sup>2</sup> Individuals with higher cognitive flexibility can quickly adjust in new conditions, manage with stress, and have fewer worries as their adaptability improves. Cognitive flexibility is the human capacity to adjust the intellectual processing strategies to confront novel conditions in the environment. People who can adapt successfully to adverse encounters have higher critical thinking capacities and simultaneously, higher cognitive flexibility.<sup>3</sup>

Furthermore, goal orientation can assist children at all levels, to better understand their objectives and motivations.<sup>4</sup> Achievement objectives provide direction by integrating adolescents' ideas and address his/her attitudes and behaviours in relation to difficult circumstances.<sup>5</sup> Research on the achievement goal literature has indicated that when adolescents are engaged in tasks or goal-oriented activities they focus on learning and development of competencies. Studies have shown positive relationship between goal orientation and improved self-esteem of adolescents.<sup>6</sup>

### Methods and Results

To investigate the association among childhood adverse experiences, cognitive flexibility, and goal orientation in adolescents, a cross-sectional study was conducted at Riphah International University, Lahore, Pakistan, from July

2021 to March 2022. Correlation research design was used in the present study. Data was collected from students of both private and government schools/colleges of Lahore. Non-Probability Purposive Sampling was carried out to recruit the sample of 250 participants, within the age range of 15-18 years. Sample size was determined by g power analysis and greens formula by (Kang H, 2021).

**Table-1:** Descriptive Statistic of Demographic Characteristics of Participants (n=250).

Demographic variables	n (%)
<b>Gender</b>	
Male	125 (49.4)
Female	125 (49.4)
<b>Age (years)</b>	
15	52 (20.6)
16	73 (28.9)
17	73 (28.9)
18	52 (20.6)
<b>Education</b>	
Matric	123 (48.6)
Intermediate	127 (50.2)
Institute	
School	125 (49.5)
College	125 (49.5)
<b>Birth order</b>	
First born	73 (28.9)
Middle born	109 (43.1)
Last born	68 (26.9)

**Table-2:** Mean, standard Deviation and t-value of gender difference in Adverse Childhood Experiences, Cognitive Flexibility and Goal Orientation (n=250).

Variables	Male	Female	t (248)	p-value	C.I 95%		Cohen's d
	Mean±SD	Mean±SD			LL	UL	
ACE	9.31±0.58	8.93±0.76	4.3	0.035	.321	0.654	0.5
CFS	10.3±3.57	12.9±2.88	-92.1	0.048	-3.21	-1.66	0.8
AGQ	10.2±3.68	13.1±1.90	-107	0.008	-2.77	-.971	0.9

Note: ACE=Adverse Childhood Experience, CFS=Cognitive Flexibility Scale, AGQ=Achievement Goal Questionnaire, n = sample size, SD = standard deviation, df=248, \*p<0.05.

**Table-3:** Correlation table of Study Variables.

Variables	n	Mean±SD	1	2	3
ACE	250	9.06±0.71	-	-.312**	-0.170**
CFS	250	66.9±1.75		-	0.184**
AGQ	250	67.0±2.14			-

ACE=Adverse Childhood Experience, CFS=Cognitive Flexibility Scale, AGQ=Achievement Goal Questionnaire, n = sample size, SD = standard deviation, p<0.01, \*\*p<0.01, \*\*\*p<0.01.

**Table-4:** Multiple Linear Regression of Adverse Childhood Experiences, Cognitive Flexibility and Goal orientation (n=250).

Variables	Model		β	C.I 95%	
	B	SE		LL	UL
Constant	27.2	12.7		2.112	52.442
ACE	-1.23	0.45	-0.170	-2.133	-0.339
CFS	0.03	0.18	0.011	-0.329	0.391

\*p<.05, \*\*p<.01, ACE= Adverse Childhood Experience, CFS = Cognitive Flexibility Scale, CI=Confidence Interval.

While conducting present research, ethical guidelines were strictly observed. Approval of the research was taken from the Ethical Review Board of Research. Permissions were sought from both authors of the actual assessment measures and authors of the translated versions of scales. Informed Consent was taken from participants, and they were thoroughly briefed about the nature of their participation in the study. They were also assured of confidentiality and safety.

Adverse Childhood Experience Scale by Felitti and Anda (2010),<sup>7</sup> Cognitive Flexibility Scale by Martin and Rubin (1995),<sup>8</sup> Achievement Goal Questionnaire by Elliot AJ, Murayama K (2008)<sup>9</sup> were used as tools for data collection. Data was analysed using SPSS version 21.

The inclusion criteria were both genders, between the age of 15 to 18 years.

Students from government and private schools and colleges participated in this research.

Individuals from divorced/separated families were excluded from the study.

Also those having any severe psychological problems or physical illness were also excluded.

The following results are based on a series of statistical analyses conducted to test the hypotheses. (i) Socio-demographic information of the sample was examined by computing descriptive statistics, (ii) Pearson product moment correlation was used to investigate the association among childhood adverse experience, cognitive flexibility, and goal orientation, (iii) Independent sample t-test was used to investigate the difference among male and female goal orientation, (iv) Multiple Regression Analysis was used to ascertain prediction of study variables in goal orientation of adolescents. (Table 1-4).

## Discussion

The aim of the research was to examine the association among childhood adverse experiences, cognitive flexibility, and goal orientation in adolescents.

The results of the study ( $r=-0.170$ ,  $p<0.01$ ) prove our first hypothesis that is: "There would be negative relationship between childhood adverse experience and goal orientation in adolescents". The results indicate that when childhood adverse experience increases, goal orientation decreases.

The second hypothesis of the study was that "There is likely to be negative relationship between childhood adverse experience and cognitive flexibility in adolescents". The results ( $r=-0.312$ ,  $p<0.01$ ) have also proved our second hypothesis.

These results have been supported by a similar study conducted by Loman MM, Johnson AE, and Westerlund found the same outcome (Loman et al., 2013). They observed that those with adverse childhood experiences take longer to react correctly in a switch-over task and exhibited lesser intellectual elasticity. Their findings indicate that individuals' cognitive flexibility was harmed by adverse childhood experiences, as long-term stress events have no more than a minor impact on cognitive flexibility.<sup>9</sup>

The third hypothesis stated that: "There is likely to be a positive relationship between cognitive flexibility and goal orientation in adolescents". The current study findings ( $r=0.184$ ,  $p<0.01$ ) prove our third hypothesis. Positive value of  $r$  indicates that if cognitive flexibility increases it results in simultaneous increase in goal orientation in adolescents.

The study also hypothesized that "Childhood adverse experiences and cognitive flexibility are likely to predict goal orientation in adolescents". The value of  $R^2=0.02$  revealed that the predictors explained 2% variance in the outcome variable with  $F(2,247) = 3.68$ ,  $p<0.05$ .

The findings showed that childhood adverse experiences significantly negatively predicted goal orientation ( $\beta=-0.170$ ,  $p<0.01$ ) whereas Cognitive flexibility significantly positively predicted goal orientation ( $\beta=0.011$ ,  $p<0.05$ ). The overall model was statistically significant which proves our hypothesis.

**Limitations:** It is recognized that the sample size was small due to certain boundaries. Larger sample size could make the findings more generalizable. Additionally, a comparative study between school going children of rural and urban areas could reveal more information regarding study variables.

## Conclusion

The aim of the current research was to study the association among childhood adverse experiences, cognitive flexibility, and goal orientation in adolescents.

From the study findings it is concluded that childhood adverse experiences negatively affect goal orientation in adolescents; moreover, childhood adverse experience negatively affects cognitive flexibility in adolescents. Whereas cognitive flexibility positively affects goal orientation in adolescents. Females have complex cognitive flexibility that is why their goal orientation is better than that of males despite their adverse childhood experiences.

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