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Original research article

Personality traits, peer attachment, and delinquent behaviour among adolescents: a cross-sectional study

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Abstract
Introduction: Adolescent delinquency remains a significant social issue shaped by both individual psychological characteristics and the quality of social relationships. Personality traits are known to influence behavioural tendencies, while peer attachment plays a critical role in adolescent development and adjustment. Understanding how these factors interact is essential for explaining delinquent behaviour.
Objectives: The aim of this study was to analyse the relationships between the five personality traits, peer attachment, and adolescent delinquent behaviour. The study focused on examining the associations between extraversion, agreeableness, conscientiousness, neuroticism, openness to experience, peer attachment, and delinquent behaviour.
Methods: A cross-sectional survey was conducted involving 399 adolescents aged 15–17 years. Standardised instruments were used to assess personality traits, peer attachment, and delinquent behaviour. Stepwise regression analysis was employed to determine the relative contributions of personality dimensions and peer attachment associated with delinquent behaviour.
Results: Extraversion and neuroticism were positively associated with delinquency, whereas openness to experience, agreeableness, and conscientiousness were negatively associated with delinquent behaviour. Peer attachment also showed a negative association with delinquency. Regression analysis identified conscientiousness as the strongest negative association, whereas extraversion showed the strongest positive association in the final regression model.
Conclusion: Personality traits and peer attachment were significantly associated with adolescent delinquent behaviour. These findings highlight the potential importance of strengthening self-regulation, emotional well-being, and positive peer relationships in efforts to reduce delinquent behaviour and promote healthier adolescent development.

Keywords: Adolescent; Conscientiousness; Delinquent behaviour; Peer attachment; Personality

Introduction

Adolescence is a critical developmental period bridging childhood and adulthood, characterised by profound biological, cognitive, emotional, and social changes (Santrock, 2018). This stage involves intensive identity formation and self-exploration, often accompanied by psychological vulnerability and emotional instability. As adolescents strive to establish autonomy and develop a coherent sense of self, they frequently experience internal conflicts and heightened stress. At the same time, there is an increasing need to form meaningful peer relationships and achieve emotional independence from parents (Zulkarnain et al., 2025b). While many adolescents successfully navigate these transitions, others experience difficulties that may compromise their psychological well-being and increase the risk of maladaptive behavioural outcomes (Steinberg, 2020).

Adolescent behaviour is shaped not only by developmental processes but also by external social influences. While some adolescents adapt successfully and maintain psychological well-being, others are more susceptible to negative environmental factors. These vulnerabilities may manifest in engagement with health-risk behaviours, including substance use, risky sexual activity, and other forms of problem behaviour (Moffitt, 1993; Steinberg, 2020). Such behaviours are associated with adverse health outcomes, including mental health problems, injury, addiction, and long-term social disadvantage. When adolescents struggle to adapt effectively to both internal and external demands, these challenges may escalate into patterns of deviant or delinquent behaviour with significant implications for individual and public health.

Delinquent behaviour among adolescents encompasses a wide range of socially unacceptable and unlawful activities, from minor infractions such as truancy and physical altercations to more serious offenses including theft and

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substance-related crimes (Santrock, 2018). It is generally defined as behaviour that violates legal or social norms and is considered harmful or disruptive by societal standards (Siegel and Welsh, 2017). Beyond legal implications, adolescent delinquency is increasingly recognised as a public health concern due to its association with mental health disorders, substance dependence, violence, and long-term psychosocial maladjustment (Aazami et al., 2023). While some adolescents engage in such behaviours temporarily as part of developmental experimentation, others exhibit persistent patterns that may evolve into chronic antisocial or criminal trajectories, necessitating early intervention and prevention efforts (Farrington and Malvaso, 2025).

Adolescent delinquency can be broadly categorised into two types: status offenses and index offenses (Bynum and Thompson, 1996). Status offenses refer to behaviours that are considered unlawful due to the individual's age, such as truancy, curfew violations, and underage drinking. Although not criminal for adults, these behaviours are important indicators of developmental risk and may be associated with later health-compromising behaviours (Farrington and Malvaso, 2025). In contrast, index offenses include more serious acts such as violence (e.g., assault and robbery) and property-related crimes (e.g., theft and burglary). These forms of delinquency are associated with more severe consequences, including injury, legal involvement, and long-term psychological distress. Understanding these distinctions is important for designing targeted prevention and health intervention strategies (Bynum and Thompson, 1996).

Delinquent behaviour does not emerge in isolation but results from the interaction of internal and environmental factors (Farrington and Malvaso, 2025). Among internal factors, personality traits are important in shaping adolescents' behavioural patterns and susceptibility to risky behaviours. These traits influence how adolescents manage emotions, interpret information, and respond to social influences, which may affect their tendency to engage in delinquent behaviour (Agnew et al., 2002). From a health perspective, certain personality profiles are associated with increased risk of impulsivity, emotional dysregulation, and maladaptive coping strategies, all of which contribute to both behavioural problems and poorer mental health outcomes (McCrae and Costa, 2008).

In addition to personality, peer attachment is a key social factor influencing adolescent behaviour. Peers serve as important agents of socialisation, shaping attitudes and behaviours that can either promote healthy development or increase the risk of delinquency (Santrock, 2018). Secure peer attachment, characterised by trust, emotional closeness, and support, contributes to emotional stability and resilience. It enhances adolescents' ability to cope with stress and reduces the likelihood of engaging in harmful behaviours (Walters, 2020). Moreover, positive peer relationships are associated with better mental health outcomes, including lower levels of emotional distress and higher psychological well-being (Schoeps et al., 2020). These supportive relationships act as protective factors, helping adolescents resist negative influences and maintain adaptive behavioural patterns.

Nevertheless, the influence of peers on adolescent behaviour may depend on the broader peer context. During adolescence, the need for social acceptance heightens sensitivity to peer influence, making individuals more likely to conform to group norms (Steinberg, 2020). When peer norms encourage antisocial or risky behaviours, adolescents may be more likely to engage in similar behaviours through processes of modelling, reinforcement, and social validation (Kim and Lee, 2023). While the present study assessed the quality of peer attachment rather than affiliation with delinquent peers, previous research suggests that peer influences can play an important role in shaping adolescent behavioural outcomes. These influences may contribute not only to behavioural problems but also to risks for mental health, safety, and overall well-being.

The main objective of this study was to analyse the relationships between the five personality traits, peer attachment, and adolescent delinquent behaviour. The study had three specific objectives: (1) to examine the relationships between the Big Five personality dimensions and delinquent behaviour; (2) to assess the relationship between peer attachment and delinquent behaviour; and (3) to identify the relative contribution of personality traits and peer attachment to delinquent behaviour.

Personality traits and delinquent behaviour

Delinquency is not limited to school dropouts or socially marginalised youth; it is also evident among adolescents engaged in formal education. This indicates that delinquent behaviour is not solely a product of social exclusion but arises from a broader interplay of developmental and environmental factors. Prior research highlights key contributors such as inadequate parental supervision, peer pressure, low academic achievement, and socioeconomic disadvantage (Farrington and Malvaso, 2025; Steinberg, 2020). Additionally, school environments may function as risk contexts when students experience academic stress, social rejection, or exposure to violence (Henry et al., 2012). These factors are associated with adverse mental and behavioural outcomes, including emotional distress, substance use, and aggression. Accordingly, adolescent delinquency is best understood within a public health framework that calls for integrated interventions across family, school, and community contexts.

Personality traits are important individual determinants of adolescent behaviour, influencing how adolescents perceive and respond to environmental stressors and social influences (Agnew et al., 2002). They influence emotional regulation, decision-making, and behavioural tendencies, thereby affecting vulnerability to delinquency. The Big Five Personality Model, comprising extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience offers a widely accepted framework for examining these individual differences (Soto and John, 2017).

Extraversion is characterised by sociability, assertiveness, and a need for stimulation (McCrae and Costa, 2008). Adolescents high in extraversion tend to be more socially active and responsive to interpersonal stimulation. The broader role of personality traits in influencing individuals' psychological responses and behavioural tendencies across different contexts has also been demonstrated in previous research (Zulkarnain et al., 2026). Empirical studies consistently show a positive association between extraversion and delinquency, with highly extraverted adolescents more likely to engage in substance use, risky activities, and rule violations. Sensation-seeking is further associated with aggression and antisocial tendencies, and susceptibility to peer influence may amplify these risks (Barlett and Anderson, 2012).

Agreeableness reflects empathy, trust, and cooperation (McCrae and Costa, 2008). High agreeableness is associated with positive social relationships and prosocial behaviour, whereas low agreeableness is linked to hostility and aggression (Gungea et al., 2017). Research consistently demonstrates a negative relationship between agreeableness and delinquency, with lower levels predicting externalising behaviours such as

aggression and defiance (Van Heel et al., 2019). High agreeableness, in contrast, promotes well-being and acts as a protective factor (Jolliffe and Farrington, 2024).

Conscientiousness involves self-discipline, responsibility, and goal-directed behaviour (McCrae and Costa, 2008). Adolescents high in conscientiousness tend to follow social norms and avoid risky behaviours, while low conscientiousness is associated with impulsivity and poor self-regulation. Previous research has consistently linked lower conscientiousness and agreeableness, and higher neuroticism, with antisocial and offending behaviour. Jolliffe and Farrington (2024) found that several Big Five dimensions were associated with self-reported offending, with some personality characteristics functioning as promotive factors associated with lower offending.

Neuroticism refers to emotional instability and a tendency toward anxiety and irritability (McCrae and Costa, 2008). Adolescents high in neuroticism may be more emotionally reactive and vulnerable to difficulties when coping with challenging situations. Previous research has also demonstrated the important role of personality traits in shaping individuals' responses and behaviours across different contexts (Zulkarnain et al., 2023). Empirical evidence suggests that neuroticism is associated with externalising and behavioural problems during adolescence (Van Heel et al., 2019). It is also strongly linked to mental health problems, including anxiety and depression.

Openness to experience encompasses curiosity, creativity, and cognitive flexibility (McCrae and Costa, 2008). Its relationship with delinquency is mixed. Some studies suggest a negative association, as openness promotes moral reasoning and adaptive coping (Gungea et al., 2017). However, it may also encourage experimentation in permissive environments, indicating that its effects depend on contextual factors such as peer influence and social norms.

Peer attachment and delinquent behaviour

Peers play a central role in adolescent development, serving as a primary source of social bonding and influence. During this stage, attachment processes increasingly shift from family to peers, making peer relationships highly influential in shaping behavioural and emotional outcomes (Santrock, 2018). While parental attachment remains important during adolescence, peer relationships become increasingly salient as adolescents spend more time with peers and rely on them for social support and interpersonal interaction. Secure attachment to prosocial peers promotes positive development by providing emotional support, strengthening resilience, and enhancing social competence (Walters, 2020). Such relationships facilitate effective emotion regulation and reduce engagement in antisocial behaviour. From a health perspective, positive peer attachment is associated with improved psychological well-being, lower stress and anxiety, and decreased involvement in risk behaviours, thereby functioning as a protective factor against delinquency.

Although peer relationships may expose adolescents to both positive and negative social influences, the present study specifically focuses on the quality of peer attachment rather than affiliation with delinquent peers. Peer attachment refers to adolescents' perceptions of trust, communication, and emotional connectedness with their peers (Armsden and Greenberg, 1987). Adolescents who report higher-quality peer attachment generally receive greater emotional support, develop stronger social competence, and demonstrate healthier interpersonal adjustment, which together function as protective factors against behavioural problems, including delinquent behaviour (Bukowski et al., 2018; Meeus, 2016).

Overall, peer attachment demonstrates a dual role in adolescent development. Prosocial peer relationships act as protective buffers that enhance psychological well-being and adaptive functioning, whereas attachment to deviant peers reinforces antisocial norms and behaviours. This highlights the importance of considering both the strength and quality of peer attachments in understanding delinquency. From a health-oriented perspective, peer relationships can either mitigate or exacerbate risk behaviours with long-term consequences for adolescent well-being.

Materials and methods

Participants

The study was conducted among senior high school students in Medan, North Sumatra, Indonesia. Participants were selected from public senior high schools based on predefined criteria, including school status, administrative approval to participate, and accessibility for data collection. Data were collected from four public senior high schools in Medan. According to data from the Medan Education Office, the city has 21 public senior high schools. Students aged 15–17 years who were enrolled during the data collection period and voluntarily agreed to participate were eligible for inclusion in the study. A total of 430 questionnaires were distributed, of which 399 were returned and considered valid for analysis, resulting in a valid response rate of 92.8%. The final sample consisted of 399 students, including 203 males (50.9%) and 196 females (49.1%). In terms of age distribution, 118 participants (29.6%) were 15 years old, 172 participants (43.1%) were 16 years old, and 109 participants (27.3%) were 17 years old.

Instruments

Delinquent behaviour was assessed using items adapted from the classification of juvenile delinquent behaviour described by Bynum and Thompson (1996). The items covered two primary categories of delinquent behaviour: status offences and index offences. The scale employed a Likert-type response format with five options: never, rarely, sometimes, often, and always. The results of the factor analysis are presented in Table 1.

Table 1. Confirmatory factor analysis and reliability for Delinquent Behaviour Scale

Types	Factor loading	Goodness-of-fit criteria	Reliability
Status offenses Index offenses	0.646 to 0.803 0.597 to 0.711	CFI: 0.933 TLI: 0.912 GFI: 0.902 RMSEA: 0.058 SRMR: 0.051	0.820

The personality instrument was developed based on the framework of the Big Five Inventory (BFI) by John et al. (2008). The instrument was designed to measure five major personality traits. The scale employs a Likert-type response format with five options: strongly disagree, disagree, neutral, agree, and strongly agree. The results of the factor analysis are presented in Table 2.

The Peer Attachment Scale, developed by Armsden and Greenberg (1987), is designed to assess the quality of adolescents' attachment relationships with their peers. The scale evaluates trust, communication, and alienation in peer relationships and employs a Likert-type response format with five options: never, rarely, sometimes, often, and always. The results of the factor analysis are presented in Table 3.

Table 2. Confirmatory factor analysis and reliability for Big Five Inventory

Dimensions	Factor loading	Goodness-of-fit criteria	Reliability
Extraversion	0.787 to 0.907	CFI: 0.950	
Agreeableness	0.725 to 0.858	TLI: 0.941	
Neuroticism	0.698 to 0.878	GFI: 0.921	0.946
Openness to experience	0.567 to 0.917	RMSEA: 0.055	
Conscientiousness	0.642 to 0.821	SRMR: 0.048	

Table 3. Confirmatory factor analysis and reliability for Peer Attachment Scale

Aspects	Factor loading	Goodness-of-fit criteria	Reliability
		CFI: 0.933	
Trust	0.508 to 0.839	TLI: 0.921	
Communication	0.573 to 0.703	GFI: 0.910	0.886
Alienation	0.663 to 0.750	RMSEA: 0.06	
		SRMR: 0.052	

Table 4. Summary of assumption testing results

Variable	*N*	Skewness	Kurtosis	Linearity (*p*)	Tolerance	VIF
Delinquent behaviour	399	1.365	1.895	–	–	–
Neuroticism	399	0.198	0.037	<0.001	0.788	1.270
Extraversion	399	–0.171	0.191	<0.001	0.852	1.173
Openness	399	0.197	0.231	0.037	0.874	1.144
Agreeableness	399	–0.125	0.373	0.005	0.831	1.204
Conscientiousness	399	–0.245	0.788	<0.001	0.741	1.349
Peer attachment	399	–0.288	0.478	0.005	0.888	1.126

Results

Pearson correlation analyses were conducted to assess the bivariate associations among the study variables. To identify the most parsimonious predictors of delinquent behaviour, stepwise multiple regression analysis was subsequently performed. Before estimating the regression models, key assumptions underlying multiple regression were evaluated to verify the suitability of the data for analysis. The results of the assumption tests are presented in Table 4. Normality of standardised residuals was examined using the Shapiro–Wilk test ($W = 0.987$, $p = 0.124$).

Homoscedasticity was assessed by inspecting a scatterplot of studentised residuals against standardised predicted values. The residuals were randomly dispersed around zero without a clear systematic pattern or funnel-shaped distribution, indicating that the assumption of homoscedasticity was reasonably satisfied. The scatterplot is shown in Fig. 1.

The Pearson correlation analysis revealed significant associations between peer attachment, the Big Five personality traits, and delinquent behaviour. Neuroticism and extraversion were positively correlated with delinquency, whereas peer attachment, agreeableness, conscientiousness, and openness to experience showed negative correlations. These results emphasise the combined influence of personality traits and social relationships on delinquent tendencies, emphasising the importance of fostering supportive peer connections and promoting protective personality characteristics. Detailed findings are presented in Table 5.

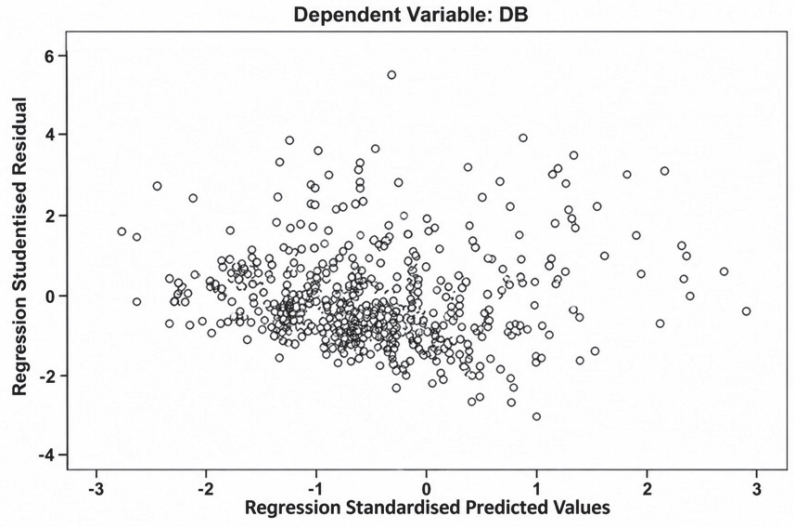


Fig. 1. Scatterplot

Table 5. Correlation matrix among variables

No	Variables	Mean	SD	1	2	3	4	5	6
1.	Delinquent behaviour	36.06	13.003						
2.	Neuroticism	17.08	3.731	0.238**					
3.	Extraversion	25.03	3.875	0.188**	–0.250**				
4.	Openness to experience	28.47	3.612	–0.104*	–0.133**	0.184**			
5.	Agreeableness	25.52	3.592	–0.140**	–0.283**	0.245**	0.181**		
6.	Conscientious ness	31.15	4.508	–0.289**	–0.355**	0.220**	0.330**	0.322**	
7	Peer attachment	72.46	11.912	–0.142**	–0.238**	0.237**	0.013	0.160**	0.040

Note: * $p < 0.05$; ** $p < 0.01$

Stepwise multiple regression analysis was employed to identify the most parsimonious combination of personality traits and peer attachment associated with delinquent behaviour. Predictor variables were entered sequentially according to their statistical contribution using the default SPSS criteria. This exploratory data-driven approach was selected because the relative predictive contributions of the study variables had not been established within the present population. Nevertheless, stepwise regression has recognised limitations, including potential model instability and sample-specific variable selection. Therefore, the findings should be interpreted as exploratory. The findings indicate that adolescents with lower conscientiousness, lower peer attachment, higher extraversion, and higher neuroticism tended to report higher levels of delinquent behaviour. Among these predictors, conscientiousness demonstrated the largest protective association, whereas extraversion showed the strongest positive association with delinquency. The results are presented in Table 6.

Table 6. Results of stepwise multiple regression analysis

Variables	B	SE	β	R^2	ΔR^2	F	t
Step 1							
Constant	62.026	4.362		0.084	0.084	36.187**	14.219**
Conscientiousness	–0.834	0.139	–0.289				–6.016**
Step 2							
Constant	45.064	5.197		0.150	0.066	34.895**	8.670**
Conscientiousness	–1.001	0.137	–0.347				–7.305**
Extraversion	0.886	0.159	0.264				5.557**
Step 3							
Constant	58.606	5.851		0.194	0.044	31.620**	10.017**
Conscientiousness	–1.032	0.134	–0.358				–7.717**
Extraversion	1.065	0.160	0.317				6.651**
Peer attachment	–0.236	0.051	–0.216				–4.633**
Step 4							
Constant	38.513	8.157		0.218	0.024	27.420**	4.721**
Conscientiousness	–0.870	0.140	–0.301				–6.216**
Extraversion	1.141	0.159	0.340				7.155**
Peer attachment	–0.196	0.051	–0.180				–3.825**
Neuroticism	0.604	0.173	0.173				3.484**

Note: ** $p < 0.01$

Discussion

The findings reveal a significant positive relationship between extraversion and delinquent behaviour among adolescents, indicating that highly extraverted individuals were more likely to report risk-taking and socially deviant activities. Extraversion, characterised by sociability, assertiveness, and stimulation-seeking (McCrae and Costa, 2008), can promote social engagement but may also be associated with aggressive and violent behaviour (Barlett and Anderson, 2012). A key mechanism that may underlie this relationship is sensation-seeking, defined as the pursuit of novel and intense experiences, which has been associated with risk-taking and conduct problems (Barlett and Anderson, 2012).

Extraversion may increase adolescents' exposure to social interactions and peer contexts, potentially influencing their engagement with peer groups. However, evidence suggests that extraversion does not necessarily increase susceptibility to delinquent peer influence, whereas characteristics such as conscientiousness may play a more important protective role (Slagt et al., 2015). Additionally, traits such as high energy and assertiveness may contribute to aggressive tendencies, a core component of delinquency (Barlett and Anderson, 2012). From a behavioural health perspective, these characteristics increase susceptibility to social pressure and maladaptive coping strategies, particularly in high-risk environments.

Neuroticism may also represent an important personality factor associated with delinquency-related behaviours. Adolescents high in neuroticism may be more emotionally unstable

and prone to negative emotional states, which can contribute to aggressive emotions and increase vulnerability to aggressive behaviour (Barlett and Anderson, 2012). Neuroticism is also associated with emotional distress and other forms of psychological vulnerability, which may contribute to maladaptive behavioural responses. Impulsivity and low frustration tolerance may further increase adolescents' vulnerability to delinquent behaviour, as difficulties in self-regulation can contribute to risk-taking, a preference for immediate gratification, and other maladaptive behavioural responses. These findings highlight the importance of interventions aimed at strengthening emotional regulation and providing mental health support as part of comprehensive efforts to prevent delinquency (Pedrini et al., 2022).

In contrast, openness to experience demonstrates a significant negative relationship with delinquent behaviour. Adolescents high in openness, characterised by curiosity, creativity, and cognitive flexibility, may be less likely to engage in antisocial activities (McCrae and Costa, 2008). Openness supports adaptive problem-solving, moral reasoning, and the ability to consider alternative perspectives, thereby potentially reducing susceptibility to negative peer influence (DeYoung, 2015; Gungea et al., 2017). It may also promote constructive engagement in exploratory and intellectual activities, which can function as protective factors. However, some evidence suggests that in certain contexts, high openness may encourage experimentation with risk behaviours (Barlett and Anderson, 2012). Overall, openness may contribute to healthier developmental outcomes through enhanced critical thinking and adaptive coping.

Agreeableness shows a significant negative correlation with delinquent behaviour, consistent with prior research linking empathy, trust, and cooperation to reduced antisocial tendencies (McCrae and Costa, 2008). Adolescents low in agreeableness are more likely to engage in criminal and aggressive behaviours. However, contrary to expectations, agreeableness did not emerge as a significant predictor in the regression analysis. This may reflect the influence of contextual factors such as cultural norms, peer dynamics, and family environments, which can moderate the expression of personality traits (Kawamoto, 2016). In collectivist settings, external social controls may outweigh individual dispositions. Additionally, environmental stressors and stronger predictors such as conscientiousness and impulsivity may overshadow its direct effects (Vazsonyi et al., 2016). Thus, while agreeableness supports prosocial behaviour, its independent contribution to delinquency may be limited.

Conscientiousness plays a protective role in adolescent delinquency. Slagt et al. (2015) found that adolescents with low or average levels of conscientiousness were more susceptible to delinquent behaviour among their peers, whereas those with high conscientiousness showed greater resilience to peer delinquency. Conversely, low conscientiousness is linked to impulsivity, poor self-regulation, and a preference for immediate gratification, increasing vulnerability to rule-breaking and aggression (John et al., 2008). Conscientious individuals are more likely to adhere to social norms, plan for the future, and maintain positive relationships with authority figures, all of which promote adaptive functioning (Gungea et al., 2017). These findings emphasise self-regulation as a critical protective factor in adolescent behavioural and mental health.

Peer attachment was found to be significantly and negatively related to delinquent behaviour. This finding suggests that high-quality peer attachment may serve as a protective factor against delinquency. Importantly, the peer attachment measure used in this study assessed the quality of adolescents' relationships with their peers, including trust, communication, and alienation, rather than attachment to delinquent peers specifically. Adolescents who develop secure and supportive peer relationships are more likely to receive emotional support, experience a sense of belonging, and engage in prosocial interactions, which may reduce their involvement in delinquent behaviour (Schoeps et al., 2020). Strong peer attachment has also been associated with better emotional regulation, resilience, resistance to negative social influences, and social competence. Supportive peer relationships can provide social support that helps adolescents cope with challenges and adapt to new environments (Yang and McGinley, 2023; Zulkarnain et al., 2019). Furthermore, positive psychosocial resources such as happiness and self-control may support healthier behavioural adjustment among adolescents by promoting self-regulation and reducing vulnerability to maladaptive behaviours (Zulkarnain et al., 2025a). Collectively, these psychosocial resources may be associated with lower levels of delinquent behaviour among adolescents.

In contrast, adolescents with insecure peer attachment, characterised by low levels of trust, poor communication, and feelings of alienation, may be more vulnerable to developing behavioural and conduct problems (Schoeps et al., 2020). Adolescents who lack supportive peer relationships may be more likely to seek acceptance through maladaptive social networks or engage in problematic behaviours as a means of coping with emotional difficulties.

Overall, these findings suggest that personality traits and the quality of peer attachment are associated with adolescent delinquent behaviour, although the cross-sectional design does not permit conclusions regarding causal relationships. While certain traits increase vulnerability, others function as protective factors, and the quality of peer attachment represents an important protective factor that is significantly associated with lower levels of delinquent behaviour. These results emphasise the importance of integrated interventions that address both individual dispositions and social environments to promote adolescent well-being.

Conclusion

This study demonstrated that personality traits and peer attachment were significantly associated with adolescent delinquent behaviour. Extraversion and neuroticism showed positive associations with delinquency, whereas conscientiousness, agreeableness, openness to experience, and peer attachment showed negative associations. Conscientiousness showed the strongest negative association with delinquent behaviour, whereas extraversion showed the strongest positive association in the final regression model. These findings suggest that both individual characteristics and the quality of peer relationships are associated with adolescent delinquent behaviour. However, because this study employed a cross-sectional design and the regression model explained only a modest proportion of the variance, causal inferences cannot be drawn. Future longitudinal studies using theory-driven analytical approaches are needed to clarify temporal relationships and identify additional determinants of adolescent delinquency.

Ethics statement

Ethical approval was obtained from the Ethics Committee of the Faculty of Psychology, Universitas Sumatera Utara (No. 38/Komet/FPsi/2024). Written informed consent was

obtained from parents, and informed assent was obtained from all adolescent participants. Participation was voluntary, with the right to decline or withdraw at any time without penalty. Responses were collected anonymously, treated confidentially, and used solely for research purposes.

Conflict of interest

The authors have no conflict of interest to declare.

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