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Research Article

Peer-perceived popularity and different forms and functions of aggression in Croatian emerging adult women

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ABSTRACT

This study examines the associations between peer-perceived popularity and aggression in emerging adult women. The sample included 155 education students from the Faculty of Teacher Education, University of Zagreb (M_{age} = 20.5 years). Students were asked to nominate their fellow students whom they perceived as popular and unpopular to assess peer-perceived popularity. The different forms and functions of aggression were measured with the Peer Conflict Scale. The results supported the prediction that peer-perceived popularity among emerging adult women plays a more significant role in proactive compared to reactive aggression. In addition to the linear associations, a curvilinear trend also emerged, indicating that proactive overt aggression is associated with peer-perceived popularity and unpopularity in emerging adult women. The relationship between peer-perceived popularity and reactive types of aggression is more complex, suggesting that the dynamics between popularity and aggression among emerging adult women warrant further research.

Keywords: peer-perceived popularity, proactive overt aggression, reactive overt aggression, proactive relational aggression, reactive relational aggression

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Introduction

Youth aggression is a global public health issue (Ferris, 2002). Therefore, understanding the underlying causes of aggressive behavior is important for developing effective prevention programs (Liu et al., 2013). One factor predicting aggressive behavior in young people is peer-perceived popularity, with research indicating that both popular and unpopular young people can exhibit aggression (Prinstein & Cillessen, 2003). However, there is limited research that analyzed the role of peer-perceived popularity in the occurrence of different forms of aggression (overt and relational) and functions of aggression (proactive and reactive), especially in the period of emerging adulthood (Stolz et al., 2016). Given that female aggression is often under-researched (Denson et al., 2018), this study aimed to determine the role of peer-perceived popularity in the occurrence of aggression of different forms and functions among emerging adult women.

Peer-perceived popularity and aggression

Human social interactions evolve from simple peer play to deeper engagement in complex social groups (Guyer & Jarcho, 2018). An important aspect of peer relationships is peer status. Peer status is associated with social functioning throughout childhood and adolescence, but much less is known about its long-term implications. A developmental phase that follows adolescence (i.e., emerging adulthood) is marked by significant diversity in social and contextual environments as well as in educational and occupational paths. As individuals' social contexts and relationships evolve, the factors associated with high status within peer groups may also shift, reflecting changes in social hierarchies and valued traits (Arnett, 2000).

The literature on peer relationships is mostly based on research conducted on children and adolescents (Chmielowice-Szymanski et al., 2024). Accordingly, peer social status has been studied as a risk factor for developing aggressive behavior, with significant evidence linking low social status among peers with social incompetence and aggressive behavior (Prinstein & Cillessen, 2003). However, adolescence is marked by the emergence of a unique form of peer status, known as peer-perceived popularity, which differs from sociometric popularity (van den Berg et al., 2020). Sociometric popularity measures how well-liked an individual is by

their peers and is generally negatively correlated with aggression (Prinstein & Cillessen, 2003; Yavuzer, 2013). In contrast, peer-perceived popularity reflects social status within a peer group, including an individual's visibility, influence, and prestige, and it is consistently found to have a positive relationship with aggression (Vaillancourt & Hymel, 2006). Peer-perceived popularity is examined through peer nominations, identifying those perceived as the most and least popular. Thus, peer-perceived popularity reflects an individual's reputation and is based on a collective agreement within the peer group regarding who is considered the most popular (Cillessen & Marks, 2011). Adolescents who are perceived as popular exhibit a complex behavioral profile that includes both positive and negative traits. They often possess qualities valued by their peers, such as attractiveness and academic success. However, some individuals who are perceived as popular may engage in social manipulation, coercion, and aggression to maintain or enhance their status (Cillessen & van den Berg, 2012). These individuals may purposely behave in ways that harm others to control their social environment and sustain or display their perceived popularity.

Understanding the manifestation of popularity across developmental stages is important, as it is closely linked to social functioning and mental health (Prinstein & Giletta, 2016). However, much less is known about peer-perceived popularity and related outcomes, such as aggression in emerging adults (Chmielowice-Szymanski et al., 2024). Some studies suggest that peer-perceived popularity may pose a lower risk for aggression in emerging adulthood compared to adolescence, likely due to a normative increase in maturity as individuals transition into emerging adulthood and develop traits and behaviors that foster social cohesion (Lansu et al., 2023; Ruschoff et al., 2015). However, studies suggest that aggressive behavior does not completely lose its role in emerging adult peer status, continuing to be an important factor in the behavioral correlates of popular individuals (Ruschoff et al., 2015). For example, Lansu and Cillessen (2012) have shown that peer-perceived popularity among emerging adults was linked to being both prosocial and aggressive, suggesting that popular emerging adults may use aggression to maintain their social status. Thus, studies show that both low and high levels of peer-perceived popularity present a risk factor for aggression. To understand how these relations occur, it is suggested that different forms and functions of aggression be examined (Stolz, 2016).

Peer-perceived popularity and forms of aggression

The literature differentiates between two primary forms of aggression: relational aggression, which involves harming others through the exploitation of social relationships, and overt aggression, characterized by direct verbal or physical harm (Andreou, 2006). Forms of aggression are differentially related to peer-perceived popularity. There are several reasons to believe that popular individuals would profit more from relational aggression than from overt aggression. For instance, relational aggression is a subtler and more "sophisticated" form of harm, allowing the perpetrator to remain unidentified and avoid allegations of aggression. This furtive nature helps maintain the aggressor's social standing without attracting negative attention (Andreou, 2006). Secondly, relational aggression is linked to a higher ability to perceive and interpret social cues accurately (Pellegrini & Roseth, 2006), and this skill is important for maintaining power and influence within social structures. Accordingly, research consistently indicates that peer-perceived popularity is positively correlated with relational aggression (Casper et al., 2020; Lu et al., 2018).

On the other hand, findings on the relationship between peer-perceived popularity and overt aggression are more inconsistent. Overtly aggressive behavior carries a higher risk to an individual's social status, as it is more conspicuous and may be perceived negatively, potentially leading to unfavorable peer evaluations. Accordingly, some studies suggest a negative association between peer-perceived popularity and overt aggression (Andreou, 2006; Cillessen & Mayeux, 2004). Conversely, overt aggression can also enhance peer status, as it may be interpreted as a sign of dominance (Cillessen & Rose, 2005). Indeed, certain studies indicate that peer-perceived popularity positively predicts overt aggression (Lu et al., 2018; Walcott et al., 2008).

Peer-perceived popularity and functions of aggression

Aggression can be understood based on the motivation of the perpetrator, yielding to the dichotomy of reactive and proactive aggression (Tuvblad et al., 2009). Reactive aggression is a violent response to a real or perceived threat, predicted by a hostile attribution bias (Quan et al., 2022). It is explained by the frustration-aggression hypothesis (Berkowitz, 1989),

according to which aggression is a hostile reaction to frustration and is associated with fear, anxiety, and difficulties in emotional regulation (Vitaro et al., 2002). In contrast, proactive aggression is rather deliberate and goal-oriented behavior aimed at achieving specific outcomes. Proactive aggression is explained by social learning theory, which posits that aggression is a learned instrumental behavior reinforced by rewards (Vitaro et al., 2002).

The definitions of proactive and reactive aggression suggest unique associations with peer-perceived popularity among adolescents. It is plausible to expect that popular adolescents engage more in proactive aggression due to its strategic and goal-oriented nature. Adolescents perceived as popular adolescents may be driven to maintain their dominance and status by using proactive aggression to control peers, thus securing power and influence within their social groups. This type of aggression is often associated with attempts to preserve a dominant social position they feel belongs to them (Prinstein & Cillessen, 2003). Studies have shown that peers frequently link peer-perceived popularity with proactive aggression, and the perceived rewards of this behavior may further reinforce its use (Prinstein & Cillessen, 2003). Proactive aggression, being instrumental and strategic, may also be connected to a certain level of social skills. This includes the ability to minimize the negative consequences of aggressive acts, aligning with the behavioral profiles of popular adolescents (Stolz et al., 2016). On the other hand, peer-perceived popular adolescents are less likely to display reactive aggression. This type of aggression is often seen as a dysregulated and uncontrolled form of expressing discontent (Fite et al., 2016). As a result, reactive aggression is more common among unpopular adolescents (Stolz et al., 2016). Reactive aggression is associated with a lack of social skills and less socially competent behavior (McAuliffe et al., 2007), which are characteristics frequently observed in unpopular adolescents.

However, previous studies exploring the relationship between peer-perceived popularity and aggression have often focused on either general aggression or specific measures of the form or function of aggression. To address the interplay between different forms and functions of aggression, this research uses a multidimensional approach that considers both the form and function of aggression. More specifically, it differentiates between

proactive overt aggression, proactive relational aggression, reactive overt aggression, and reactive relational aggression (Kempes et al., 2005).

An important aspect to consider in the relationship between peer-perceived popularity and aggression are gender differences. Compared to our understanding of male aggression, our knowledge of female aggression remains limited (Denson et al., 2018). Therefore, this study aims to address this gap by examining the role of peer-perceived popularity in the occurrence of different forms and functions of aggression among emerging adult women.

Gender prototypicality theory posits that popularity is attributed to individuals who align with gender-typical roles in both appearance and behavior (Mayeux & Kleiser, 2020). Adhering to gender norms prescribed by societal conventions may play a critical role in the development of social power. Attributes commonly associated with popularity, such as attractiveness and kindness in the case of girls, are closely aligned with traditional gender norms. Thus, those who deviate from these norms are more likely to be rejected by peers.

Since women choose relational aggression over overt aggression, relational aggression is sometimes called “female aggression” (McAndrew, 2014). Following gender prototypicality theory, studies consistently show that peer-perceived popularity positively predicts relational aggression among girls (Rose et al., 2004; Salmivalli et al., 2000). On the other hand, overtly aggressive girls may have problems with their psychosocial adjustment because these behaviors deviate from traditional gender norms (Murphy, 2008). However, research on the relationship between peer-perceived popularity and overt aggression among girls has given mixed results. Some studies suggest a positive correlation, indicating that some popular girls are overtly aggressive (de Bruyn et al., 2010; Lease et al., 2002). However, other studies did not find this relationship (Andreou, 2006; Rose et al., 2004). This indicates that not all overtly aggressive girls are socially marginalized; some are integrated into social groups and are perceived as *cool* or leaders (Estell et al., 2008).

To the best of our knowledge, only one previous study (Prinstein & Cillessen, 2003) has investigated the relationship between peer status and aggression of different forms and functions. Their findings indicate that girls' proactive aggression, regardless of its form, is associated with high peer-

perceived popularity. In contrast, the relationship between girls' reactive aggression and perceived popularity varies by form, with high levels of reactive overt aggression associated with low popularity and high levels of reactive relational aggression associated with high popularity. Some studies (Marsee et al., 2011; Šarić Drnas, 2020) show that girls manifest a higher level of reactive relational aggression than boys. Results from these studies suggest that reactive relational aggression may be a gender-normative type of aggression, so it makes it easier for women to maintain or enhance their peer status since gender-normative types of aggression are related to better peer status (Kochel et al., 2012; Zimmer et al., 2005).

In addition to linear effects where popular individuals may engage in aggressive behavior strategically to maintain their position in a group, Prinstein and Cillessen (2003) have suggested that unpopular individuals may also use the same types of aggressive behavior. However, unpopular individuals may be less effective at using aggressive strategies to enhance their social status. This pattern of findings is reflected in a subtle, curvilinear trend in which aggressive behavior is predominantly associated with high peer-perceived popularity but also significantly associated with low peer-perceived popularity. While linear models are limited by describing only a single predicted association, the examination of curvilinear trends allows for a systematic study of the heterogeneity of adolescents who may behave aggressively, suggesting that such behavior may be associated with various points along the status continuum.

Given that proactive and relational aggression are seen as an effective way of enhancing and maintaining one's high status (Gangel et al., 2017; Stolz et al., 2016), it was hypothesized that proactive overt, proactive relational, and reactive relational aggression would follow a curvilinear trend, with both popular and unpopular young women engaging more in these behaviors. In contrast, reactive overt aggression, typically driven by frustration or perceived threats (Meidenbauer et al., 2024), was expected to be more prevalent among unpopular young women due to heightened social stress and exclusion. Since popular individuals tend to have better social and emotional regulation skills (Niven et al., 2015), they were expected to exhibit lower levels of reactive overt aggression, leading to a linear rather than a curvilinear pattern.

The Current Study

The main goal of this study was to expand existing knowledge about the relationship between peer-perceived popularity and aggression among emerging adult women. Peer-perceived popularity has not been sufficiently examined as a risk factor for the occurrence of different forms and functions of aggression. Thus, the first goal of this study was to explore how peer-perceived popularity predicts different forms and functions of aggression among emerging adult women. Since peer-perceived popularity is suggested to be a risk factor for proactive types, unlike reactive types of aggression, it was hypothesized that peer-perceived popularity among emerging adult women would play a more substantial role in proactive types compared to reactive types of aggression (H1a). Moreover, it was hypothesized that peer-perceived popularity would positively predict both proactive overt aggression (H1b) and proactive relational aggression among women (H1c). Regarding reactive types of aggression, it was hypothesized that peer-perceived popularity would predict high reactive relational aggression (H2a) and low reactive overt aggression among young women (H2b) (Marsee & Frick, 2007).

The second goal of this study was to verify the existence of curvilinear associations between peer-perceived popularity and different forms and functions of aggression among emerging adult women. Thus, we assume that both popular and unpopular young women would engage in proactive overt aggression (H3a), proactive relational aggression (H3b), and reactive relational aggression (H3c). However, we do not expect a curvilinear association between peer-perceived popularity and reactive overt aggression (H3d).

This study controlled for age, material status (MS), and academic achievement to isolate the effect of perceived popularity on aggression. Although the sample was narrowly focused on emerging adult women, age remains relevant as older individuals in this stage face heightened pressures in work, relationships, and identity, which may amplify aggression (Arnett, 2000). MS may influence aggression through resource access and stress, with lower MS potentially linked with higher aggression (Greitemeyer & Sagioglou, 2016). Academic achievement may affect frustration and coping skills, with lower performance potentially associated with increased aggression (Savage et al., 2017).

Method

Participants and procedure

The study involved 155 emerging adult women (*M* = 20.5, *SD* = 1.8, age range = 18–28), all primary education students at the Faculty of Teacher Education, University of Zagreb. Most participants (85%) rated their material status as average. Participants generally had high academic achievement (see Table 1 for details). The participants were organized into eight seminar groups, each consisting of approximately 25 students, attending classes together throughout the academic year. Male students (<10% of the cohort) were excluded due to limited gender variability and research focus. Recruitment occurred one week before data collection. Eligible female students gave verbal consent for inclusion in peer nomination lists. On data collection day, participants provided written informed consent and completed paper-pencil questionnaires in a controlled classroom setting, ensuring privacy and confidentiality. Data were pseudonymized. The study was conducted by faculty members, with ethical safeguards in place to prevent conflicts of interest. Participation was voluntary, with assurances that non-participation would not affect academic evaluation. The research protocol adhered to ethical standards and was approved by the Ethics Committee of the Faculty of Teacher Education, University of Zagreb. Data collection occurred during the summer semester of the 2023/2024 academic year.

Measures

Peer-perceived popularity

Participants nominated peers from their seminar group as the "most" and "least" popular by marking an “x” on a questionnaire listing all recruited students from their group. They could nominate any number of same-sex fellow students (at least one) but not themselves. Nominations were standardized within seminar groups, and a popularity score was calculated as the difference between standardized scores for the most and least popular students. This was further standardized within seminar groups, following Parkhurst & Hopmeyer (1998) and Stoltz et al. (2016). This two-

step standardization ensures comparability within seminar groups but may cause slight deviations from a mean of 0 across groups due to variations in size, distribution, or rounding. Nominations were made within seminar groups rather than by academic year, reflecting the structured seminar system in Croatian universities, where students interact with the same peers throughout the day and semester.

Aggression

Participants were asked to nominate peers from their seminar group whom they believed: 1) threatened others when they did something wrong; 2) were deliberately cruel to others, even if they had not done anything to them; 3) spread rumors and lies about others to get what they wanted; and 4) stole friends from those that made them angry. The first question assessed peer-perceived reactive overt aggression, the second proactive overt aggression, the third proactive relational aggression, and the fourth reactive relational aggression. These items were derived from the Peer Conflict Scale (Marsee & Frick, 2007). Specifically, for each combination of form and function of aggression, the item with a high factor loading, as identified in the validation of the Peer Conflict Scale on a Croatian sample (Šarić Drnas et al., 2020) was used. The response method for the questionnaires was the same as for the popularity nominations, with participants putting an "x" next to the names on their questionnaires. Each questionnaire included the names of recruited students within that seminar group for these questions. Participants could nominate any number of same-sex fellow students, with a minimum suggestion of one nomination, and were not allowed to nominate themselves. Nominations for these categories were standardized within each seminar group. Participants were not compelled to respond to questions and were assured they could discontinue their participation at any time, adhering to the ethical guidelines for sociometric research (Guideline 2, Bell-Dolan & Wessler, 1994). If students expressed uncertainty about whom to nominate, we provided additional verbal clarification about the question's intent and ensured the anonymity of their responses.

Academic achievement

Academic achievement was measured using three indicators: (1) average grades, (2) number of exams passed, and (3) ECTS credits. To enable

aggregation, the scores for each indicator were rescaled to a common scale ranging from 1 (the lowest value) to 5 (the highest value). The rescaled values were then averaged to calculate a composite academic achievement score. Exploratory factor analysis (EFA) confirmed that these measures loaded onto a single latent factor, justifying their aggregation into a composite academic achievement score. All assumptions for EFA were met (Table A in Supplementary Materials). This method aligns with prior research (e.g., Rubić, 2021), supporting the validity of using multiple indicators to assess academic success.

Material status

Material status was assessed using a single-item measure where participants were asked to rate their material status on a five-point Likert scale (1 = *significantly below average*, 2 = *below average*, 3 = *average*, 4 = *above average*, 5 = *significantly above average*).

Data analyses

Descriptive statistics were computed for peer-perceived popularity, the four types of aggression, age, material status, and academic achievement. The results are summarized in Table 1. To test the research hypotheses, four separate hierarchical regression analyses were conducted for proactive overt, proactive relational, reactive overt, and reactive relational aggression. All analyses were conducted in *R* (R Core Team, 2023). Regression assumptions were tested before conducting the analysis (Flatt & Jacobs, 2019). No multicollinearity issues were found, and the Durbin-Watson test indicated no significant autocorrelation. However, tests revealed heteroscedasticity and deviations from normality. To address non-normality in the residuals, winsorization was applied to the peer-perceived popularity variable. This technique mitigates the influence of extreme values by replacing outliers beyond the 5th and 95th percentiles with the nearest values within these thresholds. This approach preserves the overall data distribution and normalizes the residuals, ensuring the integrity of the linear regression assumptions without altering the scale of the variables (Pek et al., 2018). Additionally, HC1 robust standard errors were employed to correct for heteroscedasticity. As prior research indicated that age, material status, and

academic achievement may affect aggression, these variables were controlled for in Step 1. In Step 2, peer-perceived popularity was introduced. Given the expectation of curvilinear trends indicating that both high and low status predict aggression, a quadratic term for popularity was included in Step 3. The results are presented in Tables 2-5.

Results

Descriptive statistics

As shown in Table 1, all types of aggression were strongly positively correlated, following the effect size benchmarks of Lovakov and Agadullina (2021). Peer-perceived popularity showed a small to moderate correlation with proactive types of aggression but was not significantly related to reactive types of aggression. Students' age showed moderate correlations with proactive types of aggression, as well as reactive overt aggression, but was not significantly related to reactive relational aggression. Additionally, students' age showed weak positive correlations with academic achievement and no significant correlation with either material status or popularity. Material status showed no significant correlations with aggression or popularity. Academic achievement was negatively correlated with reactive relational aggression, with an effect size classified as small to moderate, and had a small positive correlation with proactive relational aggression; no significant associations were found with overt aggression.

All aggression variables were positively skewed; however, following Kline's (2011) guidelines, they still met acceptable normality thresholds. Moreover, descriptive statistics suggest that relative to other types, reactive overt aggression showed the highest prominence, while proactive relational aggression was the least characteristic in this sample.

Table 1

*Pearson Correlation Coefficients and Descriptive Parameters (*N=*155)*

	1.	2.	3.	4.	5.	6.	7.	*M*	*SD*	*S*	*K*
1. Popularity	-							-.28	1.15	-1.66	7.52
2. Proactive overt aggression	.22**	-						-.34	1.12	2.34	5.68
3. Reactive overt aggression	.13	.79**	-					-.33	1.14	2.02	3.7
4. Proactive relational aggression	.16**	.65**	.66**	-				-.63	1.32	0.78	1.33
5. Reactive relational aggression	.07	.58**	.59**	.71**	-			-.45	1.41	1.78	4.73
6. Age	.08	.27**	.33**	.32**	.09	-		20.45	1.82	2.33	10.76
7. MS	.08	-.11	-.05	-.07	.00	-.13	-	-	-	-	-
8. Academic achievement	-.04	-.10	-.11	.17*	-.23**	.21**	-.03	4.24	.84	-1.39	0.71

Note. S- skewness; K-kurtosis; All correlations are Pearson's r, except those involving material status (MS), for which Spearman's rho was used due to the ordinal nature of the variable; ** $p < .01$.

Examining the linear and curvilinear relationship between peer-perceived popularity and proactive types of aggression

Tables 2 and 3 present the regression models predicting proactive types of aggression. Age positively predicted both proactive overt and relational aggression, while academic achievement showed a negative effect. MS was not a significant predictor. Peer-perceived popularity significantly predicted both proactive types of aggression, though effect sizes were small (Cohen, 1998). A curvilinear (inverse J-shaped) relationship was found for proactive overt aggression (Figure 1), but no quadratic effect emerged for relational aggression. The models explained 18% of the variance in proactive overt aggression and 20% in proactive relational aggression, highlighting the modest yet significant predictive role of sociodemographic factors and peer-perceived popularity.

Table 2

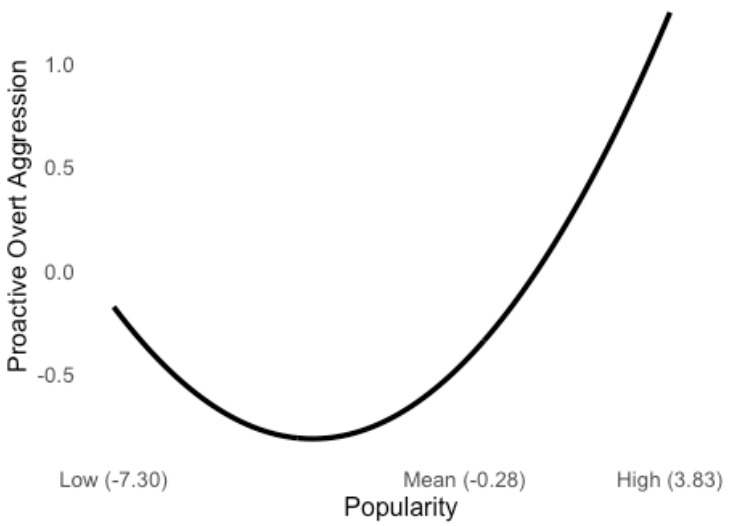
Associations Between Peer-Perceived Popularity and Proactive Overt Aggression

Predictors	Step 1 (β)	Step 2 (β)	Step 3 (β)
1. Sociodemographics			
Age	.21**	.20**	.18**
MS	.12	.13	.09
Academic achievement	-.17**	-.22**	-.27**
2. Popularity		.16**	.22**
3. Popularity*Popularity			.05**
ΔR^2		.05**	.03**
R^2	.10**	.15**	.18**

Note. ** $p < .01$

Figure 1

Curvilinear Association Between Peer-Perceived Popularity and Proactive Overt Aggression



Note. The plotted line represents predicted values from a quadratic regression model.

Table 3

Associations Between Peer-Perceived Popularity and Proactive Relational Aggression

Predictors	Step 1 (β)	Step 2 (β)	Step 3 (β)
1. Sociodemographics			
Age	.25**	.23**	.23**
MS	-.09	-.08	-.12
Academic achievement	-.36**	-.35**	-.34**
2. Popularity		.14**	.20**
3. Popularity*Popularity			.03
ΔR^2		.04*	.01
R^2	.15**	.19**	.20**

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

Examining the linear and curvilinear relationship between peer-perceived popularity and reactive types of aggression

Tables 4 and 5 summarize the regression models predicting reactive types of aggression. Age significantly predicted reactive overt aggression but was not a significant predictor of reactive relational aggression. Academic achievement was negatively associated with both reactive types of aggression, while material status (MS) was not a significant predictor. Peer-perceived popularity positively predicted reactive overt aggression, although the effect size was small (Cohen, 1998) and was not a significant predictor of reactive relational aggression. No significant curvilinear effects were found. The models accounted for 18% of the variance in reactive overt aggression and 9% in reactive relational aggression, demonstrating the relevance of these predictors while also indicating the potential influence of additional factors.

Table 4

Associations Between Peer-Perceived Popularity and Reactive Overt Aggression

Predictors	Step 1 (β)	Step 2 (β)	Step 3 (β)
1. Sociodemographics			
Age	.23**	.22**	.21**
MS	.06	.06	.06
Academic achievement	-.33**	-.32**	-.32**
2. Popularity		.14**	.16**
3. Popularity*Popularity			.03
ΔR^2		.03*	.01
R^2	.14**	.17**	.18**

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

Table 5

Associations Between Peer-Perceived Popularity and Reactive Relational Aggression

Predictors	Step 1 (β)	Step 2 (β)	Step 3 (β)
1. Sociodemographics			
Age	.08	.08	.08
MS	.04	.04	.02
Academic achievement	-.33**	-.32**	-.32**
2. Popularity		.06	.09
3. Popularity*Popularity			.01
ΔR^2		.01	.00
R^2	.08*	.09*	.09*

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

Discussion

The present study examined the association between peer-perceived popularity and different forms and functions of aggression among emerging adult women. The findings from the correlation and hierarchical regression analyses (Tables 1–5) suggest that peer-perceived popularity is more strongly associated with proactive than reactive types of aggression among young women, which is consistent with prior studies on children and adolescents (e.g., Prinstein & Cillessen, 2003). Peer-perceived popularity was a significant predictor of both proactive overt and proactive relational aggression, supporting the first hypothesis. These findings indicate that popular young women may use proactive aggression as a strategic behavior aimed at maintaining their social status. However, the increase in explained variance was small (Tables 2-3), indicating that while statistically significant, peer-perceived popularity contributed only modestly to the prediction of proactive types of aggression.

Further, peer-perceived popularity explains the largest proportion of variance in proactive overt aggression (larger than in other types of aggression), though this influence represents a small effect (Cohen, 1988). Although gender differences in different forms and functions of aggression have not been sufficiently examined, one emerging adult study (Bailey & Ostrov, 2008) has shown that men achieve higher scores on proactive overt aggression than women, which is consistent with studies carried out on adolescents (Marsee et al., 2011; Šarić, 2017). Thus, although proactive overt aggression may not be a gender-normative type of aggression for women, it still has the strongest relation with peer-perceived popularity, which is not in line with previous studies relating gender non-normative types of aggression with lower peer status (Kochel et al., 2012). However, few studies have examined the normative types of aggression in emerging adulthood. For example, Nelson et al. (2008) conducted a content analysis of students' perceptions of aggression in emerging adulthood. Their findings indicate that latency is not always a characteristic of female aggression in emerging adulthood because women may also overtly aggress if the social situation justifies or allows it. The study of Nelson et al. (2008) found that when women display overt aggression, they tend to use its verbal way rather than its physical form. Thus, according to Nelson et al. (2008), we suggest

that, in future research, proactive overt aggression is disentangled into proactive use of verbal and proactive use of physical aggression so that their independent relationships with popularity among women could be examined. The observed linear relationship between peer-perceived popularity and proactive relational aggression (Table 3) can be understood as proactive and relational aggression are typically associated with high perceived popularity (Gangel et al., 2017; Prinstein & Cillessen, 2003). Proactive aggression often manifests in a hidden, relational form rather than an overt form (Kempes et al., 2005) because it relies on social skills. Both proactive and relational aggression are positively related to social skills (Andreou, 2006; McAuliffe et al., 2007). Thus, proactively aggressive individuals may prefer relational aggression as a subtle way to achieve their goals without risking unpopularity.

Regarding relations between peer-perceived popularity and reactive types of aggression, it was hypothesized that women perceived as popular would engage in reactive relational aggression. However, the impact of perceived popularity on reactive relational aggression was not significant. On the other hand, it was assumed that peer-perceived popularity would predict lower levels of reactive overt aggression. However, this hypothesis was not confirmed. Instead, peer-perceived popularity positively predicted reactive overt aggression, although the effect size was small. Moreover, the additional variance explained in this step was minimal (Table 4), indicating a limited contribution of peer-perceived popularity to the overall prediction of reactive aggression.

As previously mentioned, studies regarding gender differences in different forms and functions of aggression are scarce. However, they show that reactive overt aggression is typically more prominent in men (Bailey & Ostrov, 2008) and adolescent boys (Marsee et al., 2011; Šarić, 2017). Although reactive overt aggression may not be typically associated with women, our study found a significant positive relation with perceived popularity, contradicting earlier studies that linked gender non-normative aggression with lower peer status (Kochel et al., 2012). The results from this study reveal a complex and inconsistent relationship between female overt aggression and peer-perceived popularity, aligning with findings from previous developmental periods (Andreou, 2006; de Bruyn et al., 2010).

Building on the findings of Nelson et al. (2008), future studies should separate overt aggression into verbal and physical aggression and examine the relationships between these two forms of aggression and peer-perceived popularity among women. Unlike physical aggression, verbal aggression may be a more effective strategy for women to maintain their dominance and popularity, although this hypothesis has yet to be examined. The second goal of this study was to verify the existence of curvilinear associations between peer-perceived popularity and different forms and functions of aggression in emerging adult women. We assumed that both popular and unpopular young women would engage in proactive overt, proactive relational, and reactive relational aggression and that no curvilinear association would be found for reactive overt aggression.

The results presented in Table 2 indicate a curvilinear association between peer-perceived popularity and proactive overt aggression, showing that both low- and high-popular emerging adult women exhibit higher levels of this behavior (Figure 1), consistent with the hypothesis and previous research (Prinstein & Cillessen, 2003; Stolz et al., 2016). Among popular women, it may serve to maintain status, while among less popular women, it may reflect attempts to gain social visibility, though often unsuccessfully. Further, contrary to expectations, no curvilinear associations were found for proactive relational and reactive relational aggression. Following the hypothesis, no curvilinear trend was observed for reactive overt aggression. The absence of a curvilinear trend in relational aggression may be due to the limitations of the peer nomination method (Mehari et al., 2019). While overt aggression is highly visible, relational aggression is more covert, making it harder for peers to recall and nominate moderate aggressors. Since nominations require selecting a limited number of peers, they may have disproportionately identified highly visible aggressors while underrepresenting subtler cases, potentially obscuring the expected curvilinear trend.

Finally, although peer-perceived popularity significantly predicted some types of aggression, its contribution was modest compared to sociodemographic factors, particularly academic achievement. Academic achievement was consistently negatively associated with all types of aggression (Tables 2–5), with the strongest effects observed for proactive

and reactive relational aggression. This aligns with meta-analytic findings by Savage et al. (2017), demonstrating a robust inverse relationship between academic achievement and aggression. Savage and Wozniak (2016) suggest that this association may be explained by cognitive deficits linked to lower academic performance, including impaired problem-solving and executive functioning, which increase reliance on aggression. Additionally, academic struggles can contribute to frustration, negative emotionality, and school disengagement, further predisposing individuals to aggressive behaviors. Age positively predicted all types of aggression except for reactive relational aggression (Tables 2–5). This suggests that as emerging adult women mature, they may be more likely to engage in proactive and reactive overt aggression, as well as proactive relational aggression. The lack of a significant association with reactive relational aggression may indicate that this type of aggression remains more stable across emerging adulthood or is influenced by other factors beyond age. Unlike academic achievement and age, material status was not a significant predictor of aggression in any analyses (Tables 2–5). One possible explanation for the non-significant role of material status in this study is the relatively low variability within the sample, as the majority of participants (85%) reported an average financial standing.

There are several limitations to this study: first, the sample consisted only of emerging adult women attending a single university and a single academic program, which greatly reduced the sample's diversity and generalizability of our findings. Thus, future research should include students from various university programs and academic years to enhance diversity. Second, while peer-nomination inventories are widely regarded as the gold standard for assessing popularity in the literature (Cillessen & Marks, 2011), their use in measuring aggression has limitations. Questionnaire-based measures may offer a more systematic and reliable approach. Future studies should consider combining these methods to enhance accuracy in assessing both constructs. Third, the study used a cross-sectional design, limiting the ability to infer causality and the stability of these relationships over time. While longitudinal studies, such as Chmielowice-Szymanski et al. (2024), have explored the link between popularity and proactive relational aggression, further research on other types of aggression and their development from middle school to university is needed. Croatia's collectivistic cultural context, which emphasizes group harmony and

discourages aggression (Strohmeier et al., 2016), likely shapes social dynamics differently from individualistic cultures, where popularity is linked to self-promotion, and aggression can serve as a tool for dominance (Sheldon et al., 2017). To fully understand these variations, cross-cultural studies are essential in examining how cultural frameworks influence the relationship between popularity and aggression.

Conclusion

This research examined the relationship between peer-perceived popularity and different forms and functions of aggression in emerging adult women. The findings indicated that peer-perceived popularity was more related to proactive than reactive types of aggression, confirming that goal-oriented aggressive behaviors are prevalent among popular women. Moreover, proactive overt aggression and peer-perceived popularity exhibited a curvilinear trend, signifying that both low and high levels of popularity are associated with proactive overt aggression. The relationships between peer-perceived popularity and reactive types of aggression were more complex, suggesting that popularity dynamics in aggression among emerging adult women warrant further research.

Conflict of interest

We have no conflicts of interest to disclose.

Data availability statement

Data files are available upon a reasonable request.

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Supplementary Materials

Table A

An Exploratory Factor Analysis for Academic Achievement

Item	Academic achievement (factor loadings)
ECTS	.96
Exams passed	.91
GPA	.61
Eigenvalue	2.35
Proportion of variance explained	71%
Kaiser-Meyer-Olkin (KMO)	.66 (Overall)
Bartlett's Test of Sphericity	$X^2 = 288.83$, df = 3, $p < 0.01$