# The role of impulsivity and positive urgency in predicting binge eating symptoms among university students using a risk-behaviour approach

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Impulsivity-related traits, particularly positive urgency, the tendency to act rashly under extreme positive emotions, have been linked to various risky behaviours, including binge eating symptoms. This study examined how impulsivity and positive urgency predict binge eating symptoms in students, considering differences between low and high risk behavior groups. A cross-sectional study was conducted with a convenience sample of 326 Croatian university students (age $M = 22.2$, $SD = 2.2$; 83.4% female), covering undergraduate and graduate levels (year of study $M = 3.2$, $SD = 1.4$). Students completed Positive Urgency Measure, The Barratt Impulsiveness Scale, the Binge Eating Scale and evaluated engagement in high-risk activities. Data were collected via online questionnaires, and gender was controlled for in all analyses. Path analysis revealed that impulsivity significantly predicted positive urgency, and both impulsivity and positive urgency directly predicted binge eating symptoms. Additionally, impulsivity had an indirect effect on binge eating symptoms through positive urgency. When analyzed by behavioural risk level, the associations somewhat differed between students in the low and high-risk behaviour group. These findings show the role of emotion-driven impulsivity in disordered eating symptoms and suggest that interventions aiming to reduce binge eating symptoms in student populations may benefit from addressing general impulsivity and positive urgency, especially in those who engage in other risk behaviours.

Keywords: *impulsivity; positive urgency; binge eating symptoms; risky behaviour; students*

## INTRODUCTION

Health and healthy lifestyle choices have become increasingly important in contemporary society, with growing recognition that patterns

established during adolescence and emerging adulthood often shape long-term physical and mental health trajectories. This developmental period represents a critical window during which both adaptive health behaviors and health risk behaviors may consolidate, with enduring consequences across adulthood.

Across adolescence and emerging adulthood, ongoing neurodevelopment shapes self-regulation, decision-making, and vulnerability to risk behaviours. Brain systems underlying affective reactivity, reward processing, and cognitive control mature along partially distinct trajectories and remain sensitive to social context and experience (Meredith & Silvers, 2024; Pozzi et al., 2021). Within this framework, developmental mismatch or dual-systems models propose that heightened reward and socioemotional sensitivity may coincide with still-developing regulatory control, increasing susceptibility to risk-taking in emotionally salient contexts (Ahmed et al., 2015; Shulman et al., 2016). Consistent meta-analytic evidence further shows continued maturation of neural systems supporting emotion reactivity and regulation across this period (Pozzi et al., 2021).

Concurrently, the transition from adolescence to adulthood has become increasingly prolonged in many societies, with emerging adulthood recognized as a distinct developmental stage spanning approximately ages 18 to 29 (Arnett et al., 2014). This period is characterized by identity exploration, instability, self-focus, feeling in-between, and a sense of possibilities (Arnett et al., 2014). The university years represent a particularly salient context within this stage, as students experience increased autonomy, shifting social networks, academic demands, and reduced direct parental monitoring.

Importantly, health risk behaviours in emerging adulthood often co-occur and cluster, rather than occurring in isolation, reflecting shared determinants such as peer norms, stress, and affect regulation. Recent university-based studies continue to show substantial co-occurrence of multiple lifestyle and behavioural risks within student populations, showing the need to examine patterns of risk rather than single behaviors in isolation (Cicekli & Gokce Eskin, 2025; Noonan et al., 2024). Recent Croatian evidence indicates that risk behaviours are both prevalent and consequential among university students. Tobacco and nicotine use remains a major concern, with newer products increasingly represented: in a recent study of university students in Croatia, approximately one-third reported using tobacco products, including conventional cigarettes as well as e-cigarettes and heated

tobacco products (Istenić et al., 2023). Similarly, alcohol-related harm remains prominent in the student years, and post-pandemic student research in the region continues to document harmful drinking patterns among university-aged students (Drenjak Lulić et al., 2023). Illicit drug use is also not uncommon; a Croatian study across five universities reported substantial levels of illicit drug use and demonstrated significant correlations between illicit drug use and both alcohol and tobacco use, supporting the broader clustering framework (Miskulin et al., 2019). In parallel, gambling appears to be an escalating public health issue for young adults, particularly given increased accessibility and normalization of online and sports betting. A recent Croatian study of university students found that gambling participation was widespread and that a sizable subgroup screened positive for gambling disorder risk (Miskulin et al., 2024). Risk-related sexual behaviours also remain relevant within emerging adulthood. While national Croatian data suggest some improvements over time (e.g., increased condom use) among young adults, sexual risk-taking remains frequent enough to warrant continued public health attention, especially because university contexts may amplify partner change and alcohol-related sexual risk (Landripet et al., 2023). Croatian university-specific findings likewise point to inconsistent contraception use among a meaningful minority of students, reinforcing the need for ongoing prevention and education in student populations (Majer et al., 2019).

Finally, beyond mentioned risk behaviours, disordered eating behaviours, like binge eating symptoms, have become a growing concern. Research consistently indicates that disordered eating symptoms are common among university students and may intensify during periods of stress and transition (Coakley, 2022). Recent study on Croatian student samples similarly documents the presence of eating-disorder symptomatology among students, supporting the inclusion of binge eating-related behaviors within the broader constellation of student health risks (Leškovar, 2022). Importantly, the present study focuses on binge eating symptoms in non-clinical populations, rather than on Binge-Eating Disorder (BED) as a formal psychiatric diagnosis. BED is defined by recurrent episodes of consuming unusually large amounts of food accompanied by a sense of loss of control, occurring at least once per week for three months and associated with marked distress and characteristic behavioral or emotional features (APA, 2014). In contrast, binge eating symptoms in non-clinical and student samples occur along a continuum of severity and may not

meet full diagnostic criteria, yet remain clinically meaningful because they are associated with psychological distress, functional impairment, and elevated risk for later psychopathology.

Recent evidence indicates that binge eating symptoms are closely linked to broader patterns of impulsive and compulsive traits. Studies report notable proportions of students screening positive for probable BED or clinically significant binge eating symptoms, alongside strong associations with impulsivity-related dimensions and other maladaptive behaviors (Solly et al., 2021; Yan et al., 2022). Impulsivity, broadly defined as a tendency toward rapid, unplanned reactions to internal or external stimuli without adequate consideration of consequences, has been consistently associated with disordered eating, substance use, and other risk behaviors in emerging adulthood (Berg et al., 2015; Pearson et al., 2015). Moreover, emotion-driven facets of impulsivity may be particularly important for understanding dysregulated eating. Within this framework, positive urgency, defined as the tendency to act rashly during intense positive emotional states, has emerged as a predictor of maladaptive behaviors across domains, including alcohol misuse, gambling, risky sexual behavior, and binge eating symptoms (Cyders & Smith, 2007; Solly et al., 2021).

Contemporary models, particularly the Affect Regulation Model of binge eating (Haedt-Matt & Keel, 2011), conceptualize binge eating symptoms as an affect-regulation strategy, whereby impulsive actions during heightened emotional arousal, both negative and positive, serve to modulate internal states. Evidence supports links between emotion dysregulation and binge-type eating, including effects of induced mood on eating and broader associations between emotion-regulation difficulties and eating-disorder symptoms (Cardi et al., 2015; Dingemans et al., 2017; Eichen et al., 2017; Leppanen et al., 2022). Furthermore, reinforcement-learning and reward-related maintenance processes show that binge eating may become more likely over time because it is negatively or positively reinforced by its immediate emotional consequences (Pearson et al., 2015).

Together, the notable prevalence of binge eating symptoms among university students, their co-occurrence with other health risk behaviors, and the central role of impulsivity, particularly positive urgency, within affect-regulation models show the importance of examining these constructs jointly in student populations. Moreover, less is known about how impulsivity, urgency, and binge eating interact specifically within university students or vary by overall engagement in multiple risk behaviours, making the university context especially

informative for investigation. The present study aimed to examine the predictive relationships between impulsivity, positive urgency, and binge eating symptoms in university students. Specifically, it was tested whether impulsivity and positive urgency predict binge eating symptoms in a general student sample, and whether these relationships differ across risk-behavior profiles.

## METHOD

### PARTICIPANTS

A convenient, non-probabilistic sample of 326 students from the Republic of Croatia was used in this cross-sectional study. Participants ranged in age from 19 to 32 years ($M = 22.2$, $SD = 2.2$). The sample included 54 males (16.6%) and 272 females (83.4%). Students were enrolled across various levels of higher education, from undergraduate to graduate programs, with an average year of study of 3.2 ($SD = 1.4$).

### MEASURES

*Positive urgency* – The Positive Urgency Measure (PUM; Cyders et al., 2007) assesses the tendency to act rashly in response to positive affective states. It consists of 14 items (e.g., »*When I am very happy, I tend to do things that may cause problems in my life*«) rated on a 4-point Likert scale (1 = »*Agree strongly*« to 4 = »*Disagree strongly*«), yielding a single total score ranging from 14 to 56. Higher scores indicate greater levels of positive urgency. In the present study, the internal consistency was good (Cronbach's α = .94), aligning with previous findings (α = .94; Cyders & Smith, 2007; Cyders et al., 2007).

*Impulsivity* – The Barratt Impulsiveness Scale (BIS-11; Patton et al., 1995) is a 30-item measure of impulsivity with six first-order factors (attention, motor, self-control, cognitive complexity, perseverance, cognitive instability) and three second-order factors: attentional impulsiveness (e.g., »*I squirm at plays or lectures*»), motor impulsiveness (e.g., »*I do things without thinking*»), and nonplanning impulsiveness (e.g., »*I say things without thinking*»). A total score is obtained by summing the first or second order factors. In the present study, only the total impulsivity score was used. Items are rated on a 4-point scale ranging from 1 (»*Rarely/Never*«) to 4 (»*Almost Always/Always*«), with total scores ranging from 30 to 120. Previous research has demonstrated acceptable internal consistency, with Cronbach's alpha values ranging from .79 to .83 (Patton et al., 1995). In this

study, the internal consistency was α = .79, indicating satisfactory reliability.

*Binge eating symptoms* – The Binge-Eating Scale (BES; Gormally et al., 1982) is a 16-item self-report instrument designed to assess the presence, severity, and behavioural manifestations of binge-eating disorder (BED). It evaluates both the frequency of binge-eating episodes and the associated emotions and cognitions. The scale includes 8 items related to behavioral symptoms and 8 focused on emotional and cognitive responses, though it functions as a unidimensional measure. Each item consists of four statements reflecting increasing severity of binge-eating behaviour, scored from 0 to 3 (with the exception of Items 4 and 16, which are scored from 0 to 2). For example, one item ranges from »*I don't have any difficulty eating slowly in the proper manner*« (0) to »*I have the habit of bolting down my food… I usually feel uncomfortably stuffed because I've eaten too much*« (3). Total scores range from 0 to 46, with higher scores indicating more frequent and severe symptoms. Severity is categorized as follows: Low (0–17): minimal or no symptoms; Mild to moderate (18–26): moderate symptoms; Severe (27+): high frequency and intensity of binge-eating. The BES is suitable for both clinical and non-clinical settings, useful for screening, monitoring treatment progress, and evaluating intervention outcomes. The scale has previously been used in Croatian studies (Pokrajac-Bulian et al., 2013), showing acceptable reliability (Cronbach's α = .81). In the present study, internal reliability was good (Cronbach's α = .87).

*Risky behaviour* was assessed using a modified version of the Self-Report Questionnaire of Risky and Delinquent Behaviour (Ručević et al., 2009), originally consisting of 40 items designed to measure risky and delinquent behaviours. For the purposes of this study, 10 items deemed appropriate for a student population were selected, and 6 additional items were developed by the authors to capture behaviours considered particularly salient in this population, including specific forms of gambling and sexual risk behaviour. The final 16-item measure assessed high-risk activities related to substance use, risky sexual behaviour, gambling behaviour, delinquent behaviour, and suicidal and self-harm behaviour. Participants responded to each behaviour with a »*Yes*« or »*No*« answer, indicating whether they had engaged in the specific behaviour in the past 12 months (e.g., »*Have you used marijuana in the past 12 months?*«). The assessed behaviours included substance use (cigarette smoking, alcohol consumption, marijuana

or hashish use, use of soft and hard drugs), sexual risk behaviours (sexual intercourse under the influence of alcohol and/or drugs, unprotected sexual intercourse, one-night stands with a casual partner), gambling behaviours (sports betting and other forms of gambling for money, such as poker, slot machines, or roulette), delinquent behaviours (intentional property damage, shoplifting, stealing), and suicidal and self-harm behaviours (suicidal thoughts, self-harm attempts, suicide attempts). A total risk score was computed by summing endorsed behaviours. Participants were then divided into two groups using a median split: those reporting up to four behaviours were classified as the low-risk group, whereas those reporting more than four behaviours were classified as the high-risk group.

At the time of data collection, a formally validated Croatian version of the Positive Urgency Measure (PUM) was not available. The Barratt Impulsiveness Scale (BIS-11) and the Binge-Eating Scale (BES) had been previously used in Croatian research (Pokrajac-Bulian et al., 2013; Sokić & Ljubin Golub, 2019); however, published psychometric validation studies for Croatian student populations were not available. Therefore, all instruments were adapted using a standard forward–backward translation procedure. First, the questionnaires were translated from English into Croatian by a bilingual psychologist. A second independent bilingual translator then performed a back-translation into English. The original and back-translated versions were compared, and discrepancies were discussed and resolved by a third researcher to ensure semantic and conceptual equivalence. Minor wording adjustments were made to improve clarity and cultural appropriateness. The finalized Croatian versions were used in the present study.

## PROCEDURE

Data were collected between April and May 2015 via an online questionnaire using Qualtrics Survey Software. Participants were recruited through targeted Facebook groups commonly used by students to communicate about academic responsibilities, as well as through forums and social media platforms. Additional participants were reached through personal contacts at various universities across Croatia.

Eligibility criteria were assessed at the beginning of the questionnaire. Participants were required to (a) be at least 18 years old, (b) currently hold student status, and (c) reside in Croatia. If a participant responded negatively to any of these questions, the survey automatically terminated and their responses were not recorded. To im-

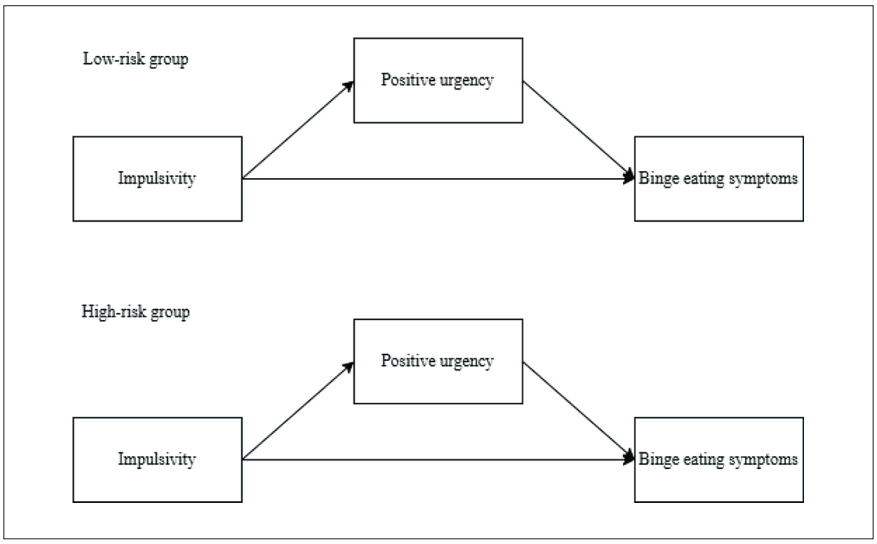


Figure 1 — Illustration of the tested model

prove data quality and reduce careless responding in the online setting, two instructed-response attention check items were embedded in the questionnaire (e.g., participants were instructed to select a specific response option such as »2« or »4« on a 1–5 Likert scale). Participants who failed either attention check were excluded from further analyses.

The study was conducted in accordance with ethical standards and received approval from the Ethics Committe of the Faculty of Croatian Studies, University of Zagreb.

## DATA ANALYSIS

To examine the hypothesized relationships, a moderated mediation path model was tested in which impulsivity was specified as the predictor, positive urgency as the mediator, and binge eating symptoms as the dependent variable. Risk behaviour (dichotomized into two groups low-risk vs. high-risk) was included as a moderator by conducting multi-group analysis (Figure 1). Gender was included as a control variable in all analyses. Beta coefficients, *p*-values ($p < .05$), and 95% confidence intervals are reported for all direct and indirect effects.

The model was estimated using maximum likelihood estimation with robust standard errors (MLR). This estimator was chosen because it provides robust standard errors and chi-square statistics that are less sensitive to violations of normality (Li, 2016), which was ap-

| | M | SD | Min | Max | Skew | Kurt. | S-W |
|---|---|---|---|---|---|---|---|
| | | | Positive urgency | | | | |
| Overall sample | 28.1 | 11.1 | 14 | 56 | .75 | -.3 | .93** |
| Low-risk behaviour group | 25.3 | 9.7 | 14 | 56 | 1.1 | .8 | .90** |
| High-risk behaviour group | 31.0 | 11.7 | 14 | 56 | .5 | -.8 | .95** |
| | | | Impulsivity | | | | |
| Overall sample | 63.1 | 9.5 | 42 | 97 | .5 | .2 | .98* |
| Low-risk behaviour group | 60.6 | 8.7 | 42 | 86 | .5 | .1 | .98* |
| High-risk behaviour group | 65.8 | 9.5 | 44 | 97 | .5 | .3 | .98 |
| | | | Risky behaviour | | | | |
| Overall sample | 3.8 | 1.7 | 1 | 11 | 1.1 | 1.7 | .90** |
| Low-risk behaviour group | 2.5 | 0.6 | 1 | 3 | -.7 | -.5 | .71** |
| High-risk behaviour group | 5.2 | 1.4 | 4 | 11 | 1.6 | 2.7 | .78** |
| | | | Binge eating symptoms | | | | |
| Overall sample | 10.3 | 7.4 | 0 | 41 | 1.5 | 1.8 | .91** |
| Low-risk behaviour group | 9.3 | 6.8 | 0 | 39 | 1.3 | 2.6 | .91** |
| High-risk behaviour group | 11.4 | 7.8 | 0 | 41 | 1.1 | 1.2 | .92** |

*Note:* Skew = skewness; Kurt. = kurtosis; S-W = Shapiro-Wilk test of normality; *p<.01; **p<.001.

**Table 1** — Descriptive statistics of positive urgency, impulsivity, risky behaviour and binge eating in the overall student sample (N = behaviour groups; N = 170 low-risk group; N = 156 high-risk group)

propriate given the non-normal distribution of variables indicated by significant Shapiro–Wilk test results ($p < .01$).

All statistical analyses were performed using statistical software JASP (Version 0.19.0) (JASP Team, 2024).

## RESULTS

### DESCRIPTIVE STATISTICS

Descriptive statistics for positive urgency, impulsivity, risky behaviour and binge eating symptoms are presented in Table 1 for the overall student sample and separately for the low-risk and high-risk behaviour groups. The overall sample showed below-average scores for pos-

| | Binge eating symptoms | | |
|---|---|---|---|
| Direct effects | β | p | 95% CI |
| Impulsivity | .221** | < .001 | [.10; .34] |
| Positive urgency | .171* | .014 | [.03; .31] |
| | Positive urgency | | |
| Direct effect | β | p | 95% CI |
| Impulsivity | .412** | < .001 | [.31; .51] |
| | R2 | p | |
| Model summary | .119** | .002 | |
| Indirect effect | Binge eating symptoms | | |
| | β | p | 95% CI |
| Impulsivity → Positive urgency | .071* | .019 | [.02; .13] |

*Note:* *p < .05; **p < .01; CI = 95% confidence interval.

**Table 2** — Direct and indirect effects of impulsivity and positive urgency on binge eating, controlling for gender, in the overall student sample (N = 326)

itive urgency ($M$ = 28.1, $SD$ = 11.1), impulsivity ($M$ = 63.1, $SD$ = 9.5), risky behaviour ($M$ = 3.8, $SD$ = 1.7) and binge eating symptoms ($M$ = 10.3, $SD$ = 7.4). Consistent patterns appeared when the sample was divided by risk behavior: the high-risk group scored higher than the low-risk group on all three variables. Specifically, the high-risk group reported greater positive urgency ($M$ = 31.0, $SD$ = 11.7 vs. $M$ = 25.3, $SD$ = 9.7), higher impulsivity ($M$ = 65.8, $SD$ = 9.5 vs. $M$ = 60.6, $SD$ = 8.7), and more binge-eating symptoms ($M$ = 11.4, $SD$ = 7.8 vs. $M$ = 9.3, $SD$ = 6.8). As expected, the high-risk group reported substantially higher levels of risky behaviour ($M$ = 5.2, $SD$ = 1.4) compared to the low-risk group ($M$ = 2.5, $SD$ = 0.6).

The Shapiro–Wilk test indicated that total scores for positive urgency, impulsivity, risky behaviour, and binge eating significantly deviated from normality ($p$ < .01). However, skewness and kurtosis values were generally within ±1, suggesting no substantial departures from symmetry or severe non-normality. Despite the relatively acceptable distributional indices, the assumption of univariate normality was not formally met. Therefore, maximum likelihood estimation with robust standard errors (MLR) was applied in the subsequent ath standard errors and chi-square statistics that are robust to non-normal data (Li, 2016).

| | Binge eating symptoms | | | | | |
|---|---|---|---|---|---|---|
| | Low-risk behaviour | | | High-risk behaviour | | |
| By risk behaviour groups | β | p | 95% CI | β | p | 95% CI |
| Impulsivity | .336** | < .001 | [.17; .48] | .126 | .148 | [-.05; .27] |
| Positive urgency | .062 | .513 | [-.12; .22] | .244** | .009 | [.06; .40] |
| | Positive urgency | | | | | |
| | Low-risk behaviour | | | High-risk behaviour | | |
| Direct effects | β | p | 95% CI | β | p | 95% CI |
| Impulsivity | .393** | < .001 | [.23; .53] | .378** | < .001 | [.24; .50] |
| Model summary | R2 | p | | R2 | p | |
| | .145* | .018 | | .109* | .034 | |
| | Binge eating symptoms | | | | | |
| | Low-risk behaviour | | | High-risk behaviour | | |
| Indirect effect | β | p | 95% CI | β | p | 95% CI |
| Impulsivity → Positive urgency | .021 | .515 | [-.04; .07] | .071* | .024 | [.01; .12] |

*Note:* *p < .05; **p < .01; CI = 95% confidence interval.

**Table 3** — Risk behaviour as a moderator of the direct and indirect effects of impulsivity and positive urgency on binge eating, controlling for gender (N = 170 low-risk group; N = 156 high-risk group)

*The direct and indirect effects of impulsivity on binge eating symptoms: The mediating role of positive urgency and the moderating role of risk behaviour*

Table 2 presents the direct and indirect effects of impulsivity on binge eating symptoms through positive urgency in the overall sample, with gender included as a control variable. The tested model explained 11.9% of the variance in binge eating symptoms ($p = .002$).

In the overall sample, impulsivity significantly predicted positive urgency ($\beta = .412$, $p < .001$), such that higher impulsivity was associated with higher levels of positive urgency. Both impulsivity ($\beta = .221$, $p < .001$) and positive urgency ($\beta = .171$, $p = .014$) showed significant direct effects on binge eating symptoms, indicating that students with higher impulsivity and higher positive urgency tend to report more binge eating behaviors. Additionally, the indirect effect of impulsivity on binge eating via positive urgency was significant ($\beta = .071$, $p = .019$), indicating higher impulsivity was associated with

greater positive urgency, which in turn predicted more binge eating symptoms.

Table 3 presents the same model estimated separately for the low-risk and high-risk behaviour groups (multi-group analysis). The model explained 14.5% of the variance in binge eating symptoms in the low-risk group ($p = .018$) and 10.9% in the high-risk group ($p = .034$).

Across both groups, impulsivity remained a significant predictor of positive urgency (low-risk: $\beta = .393$, $p < .001$; high-risk: $\beta = .378$, $p < .001$). However, differences emerged in the prediction of binge eating symptoms. In the low-risk group, impulsivity had a significant direct effect on binge eating ($\beta = .336$, $p < .001$), whereas positive urgency did not ($\beta = .062$, $p = .513$). In contrast, in the high-risk group, positive urgency significantly predicted binge eating ($\beta = .244$, $p = .009$), while the direct effect of impulsivity was not significant ($\beta = .126$, $p = .148$).

Consistent with this pattern, the indirect effect of impulsivity on binge eating through positive urgency was significant only in the high-risk group ($\beta = .071$, $p = .024$), but not in the low-risk group ($\beta = .021$, $p = .515$).

## DISCUSSION

The present study examined the predictive roles of impulsivity and positive urgency in binge eating symptoms among university students within a broader risk-behaviour framework. Consistent with our expectations, students engaging in higher levels of health risk behaviours reported somewhat greater impulsivity, higher positive urgency, and more binge eating symptoms. These findings reinforce the clustering perspective, suggesting that binge eating symptoms do not occur in isolation but are often part of a broader pattern of risky behaviors (Hutchesson et al., 2022; Noonan et al., 2024).

### IMPULSIVITY, POSITIVE URGENCY, AND BINGE EATING SYMPTOMS AMONG STUDENTS

In the overall student sample, impulsivity was positively associated with positive urgency, supporting multidimensional conceptualizations that distinguish general impulsive tendencies from affect-driven urgency facets (Cyders & Smith, 2007). Both impulsivity and positive urgency independently predicted binge eating symptoms, and positive urgency partially mediated the association between impulsivity and binge eating. This pattern aligns with affect-regulation accounts

of dysregulated eating, which propose that binge eating may function to modulate internal emotional states and is closely linked to emotion-regulation difficulties and reinforcement processes (Cardi et al., 2015; Dingemans et al., 2017; Eichen et al., 2017; Leppänen et al., 2022; Pearson et al., 2015).

From a developmental perspective, these findings are consistent with models discussing ongoing maturation of affective and regulatory neural systems during adolescence and emerging adulthood (Casey et al., 2008; Shulman et al., 2016; Pozzi et al., 2021). Heightened emotional and reward sensitivity combined with still-developing regulatory control may increase vulnerability to impulsive, emotionally driven behaviours, including dysregulated eating. Importantly, the modest effect sizes observed suggest that impulsivity and urgency represent meaningful but partial contributors within a broader, multifactorial etiology of binge eating.

## DIFFERENTIAL PATTERNS ACROSS RISK-BEHAVIOUR PROFILES

Among low-risk students, impulsivity directly predicted binge eating symptoms, whereas positive urgency did not. This suggests that, in the absence of broader behavioural risk clustering, binge eating may reflect more general self-regulatory or inhibitory-control vulnerabilities rather than affect-driven impulsivity specifically. Such interpretations are compatible with broader personality-based models of impulsive behaviour in emerging adulthood (Berg et al., 2015; Pearson et al., 2015).

Conversely, among high-risk students, positive urgency significantly predicted binge eating symptoms, while the direct effect of impulsivity was no longer significant, and the indirect pathway from impulsivity to binge eating through positive urgency emerged only in this group. This pattern indicates that emotion-driven impulsivity may be particularly central when binge eating symptoms occur within a wider constellation of risky behaviours. Reinforcement-learning perspectives suggest that repeated engagement in rewarding or affect-modulating behaviours may strengthen urgency-driven responding over time, contributing to the co-occurrence of binge eating with substance use, gambling, and other risk behaviours (Pearson et al., 2015). These findings are also compatible with developmental frameworks emphasizing interactions between affective reactivity, regulatory control, and environmental context during emerging adulthood (Meredith & Silvers, 2024; Pozzi et al., 2021). Students embedded in higher-risk behavioural environments may experience stronger

emotional activation and reward sensitivity, thereby increasing reliance on urgency-driven coping behaviours, including binge eating.

This study provides valuable insights into the complex relationship between impulsivity, positive urgency and binge eating symptoms. From a clinical and public health perspective, these findings show the need for targeted interventions that differentiate between impulsivity types and account for students' overall behavioral profiles. Traditional prevention efforts aimed at reducing impulsivity may be effective for low-risk students but may fall short for high-risk individuals unless they also address the emotional triggers captured by constructs like positive urgency. Programs focused on emotion regulation, self-awareness, and coping skills, particularly during positive affective states, could offer more precise and effective approaches to reduce binge eating symptoms and other interconnected risk behaviours in university settings. In terms of practical implications, the findings of this study can also help educational professionals, such as teachers/professors and university counsellors, recognize symptoms of binge eating in university students and refer at-risk individuals to specialists for further support. Additionally, these professionals can use the research findings to educate and raise awareness among other educators and students about binge eating and risk behaviours, promoting a safer and healthier environment.

However, when interpreting these results study limitations need to be considered. The primary limitation is the use of a cross-sectional design, which does not allow drawing conclusions about developmental trajectories or the temporal causal relationships between impulsivity, positive urgency and binge eating symptoms. To address this limitation, future research should use longitudinal designs to better capture the dynamic nature of these relationships and provide deeper insight into how impulsivity and positive urgency contribute to the development of binge eating over time. Moreover, future studies should explore these associations in greater detail by identifying specific sociodemographic, personality, or psychological characteristics that may moderate or mediate the relationship between impulsivity, positive urgency and binge eating symptoms. Understanding these individual differences could help refine intervention strategies by tailoring them to the profiles of young people who are particularly vulnerable and at higher risk of developing binge eating symptoms. Additionally, the research was conducted online, which introduces typical limitations associated with online studies. Despite efforts to

ensure that participants were university students through repeated instructions (explicitly stating requirements and incorporating student status-related questions) and filtering out those who did not meet the criteria, it cannot be confirmed that the desired sample was fully represented. Although gender was statistically controlled for in the analyses, the sample was imbalanced, with a substantial overrepresentation of female participants. Future studies should aim to recruit more gender-balanced samples which would allow for more reliable examination of potential gender differences. Furthermore, the sample was limited to students in Croatia, which may not reflect the experiences of students in different cultural contexts. Future studies should aim to include more diverse samples to improve the generalizability of the findings.

## CONCLUSION

Impulsivity and positive urgency both contribute to binge eating symptoms among university students, but their roles differ depending on overall engagement in health risk behaviours. General impulsivity appears more relevant among lower-risk students, whereas emotion-driven impulsivity, particularly positive urgency, plays a stronger role within broader patterns of behavioural risk. These findings show the importance of integrating personality-based vulnerability models with developmental and clustering perspectives when examining disordered eating in emerging adulthood.

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