

Behavioral inhibition/activation, negative affect, emotion dysregulation, and anger rumination in aggressive and antisocial behavior

(Inhibición/activación conductual, afecto negativo, desregulación emocional y rumiación de ira en conductas agresivas y antisociales)

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Abstract: Aggressive and antisocial behaviors are symptomatic indicators of antisocial psychopathology and may be explained by transdiagnostic variables at structural, emotional, and cognitive levels. This study aimed to develop a preliminary multivariate explanatory model incorporating structural variables—behavioral activation and inhibition systems (BIS-BAS) and trait negative affect (NA-trait)—an emotional variable—emotion dysregulation (ED)—and a cognitive variable—anger rumination (AR)—associated with aggressive and antisocial behaviors in adolescents and young adults. The sample comprised 351 males aged 14 to 25 years ($M = 17.81$, $SD = 3.11$) recruited from two educational institutions and two correctional facilities in Sonora, Mexico. Path analysis indicated that the structural, emotional, and cognitive variables predicted aggression and antisocial behavior. Specifically, BIS and NA-trait were associated with greater emotion dysregulation linked to reactive aggression, whereas BAS was associated with greater anger rumination in proactive aggressive and antisocial behaviors. The transdiagnostic model showed greater explanatory power for aggression-related symptoms (reactive aggression, $R^2 = .35$; proactive aggression, $R^2 = .28$) than for antisocial behavior ($R^2 = .17$). These findings support incorporating emotion regulation and anger rumination into the assessment and design of transdiagnostic interventions for adolescents and young adults exhibiting aggressive and antisocial behaviors.

Keywords: psychopathology; BIS/BAS; transdiagnostic; antisocial behavior; cognition; emotional regulation.

Resumen: Las conductas agresivas y antisociales son indicadores sintomáticos de psicopatologías antisociales y pueden explicarse mediante variables transdiagnósticas de nivel estructural, emocional y cognitivo. El objetivo de este estudio fue desarrollar un modelo explicativo multivariado preliminar que incorporara variables estructurales —sistemas de activación e inhibición conductual (BIS-BAS) y rasgo de afecto negativo (NA-trait)—, emocionales —desregulación emocional (ED)— y cognitivas —rumiación de la ira (AR)— asociadas con conductas agresivas y antisociales en adolescentes y adultos jóvenes. La muestra estuvo compuesta por 351 varones de 14 a 25 años ($M = 17.81$, $DE = 3.11$), provenientes de dos instituciones educativas y dos centros correccionales de Sonora, México. Los resultados del análisis de senderos indicaron que las variables estructurales, emocionales y cognitivas predijeron la agresión y las conductas antisociales. En particular, BIS y NA-trait se asociaron con mayor desregulación emocional vinculada a la agresión reactiva, mientras que BAS se relacionó con mayor rumiación de la ira en las conductas agresivas proactivas y antisociales. El modelo transdiagnóstico mostró mayor capacidad explicativa para los síntomas de agresión (agresión reactiva, $R^2 = .35$; agresión proactiva, $R^2 = .28$) que para las conductas antisociales ($R^2 = .17$). Estos hallazgos respaldan la

incorporación de la regulación emocional y la rumiación de la ira en la evaluación y el diseño de intervenciones transdiagnósticas para adolescentes y adultos jóvenes con conductas agresivas y antisociales.

Palabras clave: psicopatología; BIS/BAS; transdiagnóstico; comportamiento antisocial; cognición; regulación emocional.

Resumo: Os comportamentos agressivos e antissociais são indicadores sintomáticos de psicopatologias antissociais e podem ser explicados por variáveis transdiagnósticas nos níveis estrutural, emocional e cognitivo. O objetivo deste estudo foi desenvolver um modelo explicativo multivariado preliminar que incorporasse variáveis estruturais —sistemas de ativação e inibição comportamental (BIS-BAS) e traço de afeto negativo (NA-trait)—, emocionais —desregulação emocional (ED)— e cognitivas —ruminação da raiva (AR)— associadas a comportamentos agressivos e antissociais em adolescentes e adultos jovens. A amostra foi composta por 351 participantes do sexo masculino, com idades entre 14 e 25 anos ($M = 17,81$; $DP = 3,11$), provenientes de duas instituições de ensino e dois centros correccionais em Sonora, México. Os resultados da análise de caminhos indicaram que as variáveis estruturais, emocionais e cognitivas predizem a agressão e os comportamentos antissociais. Especificamente, BIS e NA-trait associaram-se a maior desregulação emocional vinculada à agressão reativa, enquanto BAS se relacionou a maior ruminação da raiva nos comportamentos agressivos proativos e antissociais. O modelo transdiagnóstico apresentou maior capacidade explicativa para os sintomas relacionados à agressão (agressão reativa, $R^2 = 0,35$; agressão proativa, $R^2 = 0,28$) do que para os comportamentos antissociais ($R^2 = 0,17$). Esses achados sustentam a incorporação da regulação emocional e da ruminação da raiva na avaliação e no planejamento de intervenções transdiagnósticas para adolescentes e adultos jovens com comportamentos agressivos e antissociais.

Palavras-chave: psicopatologia; BIS/BAS; transdiagnóstico; comportamento antisocial; cognição; regulação emocional.

1. Introduction

Aggressive and antisocial behaviors represent a significant issue that entails substantial economic and human costs, primarily related to criminal activity. In Mexico, approximately 30 million crimes were reported in 2019, with one-third committed by individuals under the age of 25 (Instituto Nacional de Estadística y Geografía, 2019). Furthermore, it has been reported that out of 12,000 children and adolescents aged 14 to 18, many have already been arrested, and 7,136 have been institutionalized (Coronado, 2020). These data underscore the relevance of conducting studies focused on emotional and behavioral regulation capacities within this specific population. Aggressive and antisocial behaviors have been recognized as fundamental clinical indicators for understanding antisocial disorders across childhood, adolescence, and adulthood. These behaviors are associated with disruptive or impulsive tendencies, forming a diagnostic spectrum of externalizing psychopathologies organized by shared etiologies (Krueger et al., 2005) and comorbid symptoms, including psychopathy (Wygant et al., 2016) and reactive or proactive aggression (Penado et al., 2014).

In line with this, investigating aggressive and antisocial behaviors supports a transdiagnostic model of psychopathology research. This model aims to develop explanatory frameworks across multiple diagnoses and processes by identifying symptom commonalities (Mansell et al., 2009). The goal is to isolate a limited set of key mechanisms with high explanatory power to enhance the understanding of comorbid psychopathologies (Mansell et al., 2009). This transdiagnostic approach highlights several empirically supported variables for understanding aggressive and antisocial behaviors, including anger rumination and emotional dysregulation. It also incorporates established theoretical foundations, such as Gray's reinforcement sensitivity theory (Gray, 1970), a neurobiological model explaining behavior and emotion regulation through three systems: 1) the Behavioral Activation System (BAS), which drives motivation and approach behaviors towards appetitive stimuli (rewards) and pleasurable emotions; 2) the Behavioral Inhibition System (BIS), related to punishment sensitivity and reward omission; and 3) the Fight-Flight-Freeze System (FFFS), which

mediates responses to aversive, conditioned, and unconditioned stimuli (McNaughton & Gray, 2024). In the revised Reinforcement Sensitivity Theory (rRST; Gray & McNaughton, 2000), the FFFS is clearly distinguished from the Behavioral Inhibition System (BIS). Unlike the BIS, which is activated in situations of goal conflict and is associated with anxiety, the FFFS specifically mediates fear responses to imminent threats (Espinoza-Oyarce et al., 2024).

It can be posited that both approach and avoidance mechanisms serve as explanatory factors in the development of various psychopathologies (e.g., Toro et al., 2020). Evidence has shown that elevated BAS predicts pathological narcissistic behaviors, often comorbid with substance abuse and linked to low self-control (low BIS) (Subramanian et al., 2022). These systems act as mediators in psychopathic traits and externalizing behaviors (Włodarska et al., 2021). Thus, structural personality variables are associated with chronic experiences of discomfort or negative affect. For example, a trait variable related to neuroticism has been established at the transdiagnostic level, derived from the Negative Affect Trait (NA-trait) (Barlow et al., 2014). This construct is associated with behavioral inhibition and difficulties in emotion regulation, suggesting that it constitutes an additional structural variable linked to the behavioral activation and inhibition systems (Purnamaningsih, 2017; Ramer et al., 2024). In this regard, the NA-trait is assumed to be a key transdiagnostic variable, given its characterization as a general factor in psychopathology, particularly concerning the persistent experience of negative emotions (Barlow et al., 2014).

These findings imply that processes with high predictive power for aggressive and antisocial behaviors align with the transdiagnostic framework. However, these variable relationships are non-unidirectional and appear to involve multiple mediating variables. Emotional dysregulation is one such mediator, given deficits in skills such as acceptance, tolerance, and the ability to modify experience, expression, and physiological responses to unwanted emotions in response to contextual demands (Gross, 2013). Specifically, adolescents with emotional dysregulation are at increased risk for psychoactive substance use, externalizing and internalizing symptoms (Wills et al., 2015), aggressive behavior, and diminished inhibitory control (Khoshfetrat et al., 2022; Verona & Bresin, 2015). Thus, emotional dysregulation is seen as a key factor in understanding aggressive and antisocial behaviors, due to deficits in executive function, decision-making, and adaptive coping (Modecki et al., 2017). Additionally, emotional dysregulation is strongly linked to experiential avoidance—the tendency to avoid unwanted internal experiences such as memories, images, bodily sensations, thoughts, and emotions (Hayes et al., 1999). Emerging evidence indicates that experiential avoidance involves emotional regulation strategies such as behavioral avoidance, cognitive reevaluation, and response suppression (Wolgast et al., 2013). In this context, experiential avoidance is associated with externalizing psychopathologies, especially in response to distress (e.g., NA-trait) as a motivational factor within a contextual model, predisposing individuals to physical, psychological, and sexual aggression (Mathes, 2024). Therefore, it is hypothesized that emotion regulation difficulties associated with experiential avoidance constitute a latent variable termed Emotional Dysregulation. This variable is proposed to mediate the relationship between trait negative affect and BIS/BAS sensitivities, subsequently exerting effects on anger rumination, which in turn influences antisocial/delinquent and aggressive behaviors.

At the cognitive level, anger rumination is a perseverative thought process involving a significant anger-inducing event, engaging prefrontal and subcortical regions involved in self-referential processing, social cognition, and emotional dysregulation, manifesting as difficulties with thought suppression and self-control (Denson, 2012). Anger rumination involves processes such as memory recall of anger-inducing events as triggers, attention to recent anger experiences as intensifiers, and post-anger thoughts as

reinforcing factors (Sukhodolsky et al., 2001). This rumination pattern has been widely recognized both as a direct risk factor for proactive and reactive aggression (Wang et al., 2018) and as a potential transdiagnostic process underlying borderline and antisocial symptoms (Kelley et al., 2021). It also predicts aggression tendencies stemming from emotional dysregulation (Martino et al., 2015) and secondary psychopathy in young adults (Guerra & White, 2017), and general externalizing/internalizing problems (Scaini et al., 2025). These findings suggest that anger rumination could be considered a relevant transdiagnostic variable in models explaining antisocial and aggressive behavior (du Pont et al., 2017).

1.1 The present study

Within the Research Domain Criteria (RDoC) framework, variables associated with positive and negative valence systems, as well as cognitive and regulatory systems, are aimed at advancing integrative psychopathology by addressing key questions in the field (Cuthbert, 2022). Theoretically, aggressive and antisocial behaviors are posited to emerge from interactions among BIS/BAS and NA-Trait variables, which serve as foundational components of emotional dysregulation and experiential avoidance, differentially associated with BIS and BAS systems (Hundt et al., 2013). This is consistent with findings linking reward-seeking with introversion and extraversion dimensions (Pederson et al., 2018).

From a transdiagnostic perspective, integrating these variables into a multivariate model could enhance our understanding of the underlying causes of aggressive and antisocial behavior. In this study, we hypothesized that the BIS and BAS motivational systems, along with NA-trait as structural variables (Merchán-Clavellino et al., 2019), interact with emotional dysregulation (including experiential avoidance) and anger rumination within a preliminary transdiagnostic model of aggressive and antisocial behaviors (Khoshfetrat et al., 2022). The development of a predictive model with substantial explanatory power will contribute to the current literature by opening new avenues for research on transdiagnostic variables, particularly those associated with reinforcement sensitivity and the regulatory mechanisms underlying antisocial behavior in adolescents and young adults. By systematically integrating emotional, cognitive, and behavioral dimensions, this study will advance the etiological understanding of these phenomena across clinical and subclinical populations. The resulting evidence will provide a robust and versatile empirical foundation for optimizing the design of preventive strategies and therapeutic intervention programs in institutional contexts.

Accordingly, two key components (high emotional dysregulation and anger rumination) emerge as predisposing factors in the anger responses associated with aggressive and antisocial behaviors. Although the causal role of these cognitive and emotional variables in antisocial psychopathologies remains unclear (Donahue et al., 2014), a significant association between emotional dysregulation and consequent aggressive and antisocial behaviors is generally assumed. Moreover, anger rumination, as a cognitive process inherent in anger responses, is recognized as a key predictor of subsequent aggressive behaviors (Guerra & White, 2017; Scaini et al., 2025; Wang et al., 2018). The study hypotheses propose that BIS, BAS, and NA-trait (structural level) act as significant predictors of emotional dysregulation associated with experiential avoidance (emotional level) [H1], and anger rumination (cognitive level) [H2], leading to aggressive and antisocial behaviors [H3], which are indicators of antisocial psychopathology.

2. Objectives

The aim of this study was to develop a preliminary multivariate explanatory model incorporating structural (Behavioral Activation and Inhibition Systems [BIS-BAS], Trait Negative Affect [NA-trait]), emotional (Emotional Dysregulation [ED]), and cognitive

(Anger Rumination [AR]) variables underlying aggressive and antisocial behaviors in adolescents and young adults. That is, it was specifically expected to a) analyze the predictive capacity of BIS-BAS and NA-trait on ED (emotion regulation difficulties combined with experiential avoidance); and b) analyze their predictive capacity on AR. Collectively, c) the predictive capacity of these variables on indicators of antisocial psychopathology—including aggressive behaviors and antisocial/delinquent conduct—was to be examined in the adolescent and young adult participants of the study.

3. Method

3.1 Participants

A non-probabilistic sampling method was used, resulting in a sample of 351 males aged between 14 and 25 years ($M = 17.81$, $SD = 3.11$), drawn from two educational institutions and two correctional and prison centers in a northwestern state of Mexico. Subgroups were formed based on age and institutional setting. Table 1 summarizes the demographic characteristics of the participants and the study groups.

Table 1

Demographic characteristics of participants (n = 351)

Variable (total sample)	Institutionalized (sample 1)	Students (sample 2)
Age		
$n = 351$	$n = 167$	$n = 184$
$M = 17.81$ years, $SD = 3.11$, minimum 14 and maximum 25 years.	$M = 19.16$, $SD = 3.09$, minimum 14 and maximum 25 years	$M = 16.58$, $SD = 2.59$ minimum 14 and maximum 25 years
Educational level		
No formal education: $n = 3$, 0.85%	$n = 3$, 1.79%	$n = 0$, 0%
Elementary: $n = 32$, 9.11%	$n = 32$, 19.16%	$n = 0$, 0%
Middle: $n = 90$, 25.64%	$n = 87$, 52.09%	$n = 3$, 1.63%
High School: $n = 187$, 53.27%	$n = 44$, 26.34%	$n = 143$, 77.71%
College: $n = 39$, 11.11%	$n = 1$, 0.59%	$n = 38$, 20.65%
Total: $n = 351$, 100%	$n = 167$, 47.58%	$n = 184$, 52.42%

Note. M (Mean), SD (Standard Deviation).

The adequacy of the sample size was evaluated considering both classical and contemporary recommendations for structural equation modeling. The obtained sample exceeds the traditional recommendation of five to ten observations per free parameter (Bentler & Chou, 1987) and is consistent with current methodological guidelines indicating that sample size adequacy depends on model complexity, measurement quality, and the magnitude of relations among latent variables (Kline, 2023). Furthermore, Monte Carlo simulation studies have shown that structural equation models of moderate complexity with strong factor loadings can be estimated reliably with samples of approximately 300 participants or more (Wolf et al., 2013). Therefore, the sample size was considered adequate for estimating the proposed structural equation model.

Inclusion criteria required voluntary participation in the study. Exclusion criteria included the presence of medical or psychiatric conditions or being under the influence of psychoactive substances at the time of completing the psychometric instruments. These criteria were verified through prior consultation with the directors of the participating centers and the psychology departments,

based on their evaluation and admission procedures. Three individuals declined participation, and no participants were excluded based on other exclusion criteria.

3.2 Design

This study employed a non-experimental, cross-sectional design with a correlational-predictive scope. Path analysis based on Structural Equation Modeling (SEM) was used to estimate direct and indirect effects among structural, emotional, cognitive, and behavioral variables.

3.3 Instruments

3.3.1 International Item Pool Revised for BIS/BAS Personality (BIS-BAS IPIP-R)

The scale developed to assess the BIS/BAS dimensions as personality measures in which each item describes typical behaviors of individuals—items 1 through 8 make up the BAS subscale, and items 9 through 16 the BIS subscale— (Goldberg, 1999). The items, phrased as statements, appear in the instrument as “Seek adventure.” and “Am afraid of many things”. The response is given on a Likert scale with five options (1 = “strongly disagree”, up to 5 = “strongly agree”). The Spanish language version was used (Martínez et al., 2012), an instrument that showed favorable Cronbach's Alpha indexes $\alpha = .74$ in the BIS dimension and $\alpha = .86$ in the BAS. This item pool demonstrated favorable evidence of validity and reliability in Latin American young adults.

3.3.2 Positive and Negative Affect Schedule (PANAS)

The PANAS is a scale designed to assess negative and positive affect; it contains ten items for each dimension, with a Likert-type response format (1 = “Very little or none,” up to 5 = “Extremely”) (Watson et al., 1988). The items, phrased as statements, appear in the instrument as “Nervous” and “Excited”. In this study, we used the version adapted for Mexico (Robles & Páez, 2003). As part of its application, the participant is asked to answer the affective states that were present in the last week (state) and generally (trait). In this version, the authors reported favorable internal consistency for positive ($\alpha = .85$), and negative affect ($\alpha = .81$), and test-retest stability ($r = .31$ in negative affect and $r = .34$ in positive affect). This scale demonstrated favorable evidence of validity and reliability in Latin American adolescents and young adults.

3.3.3 Difficulties in Emotion Regulation Scale (DERS)

The DERS was designed to assess difficulties in emotional dysregulation in four related factors: non-acceptance of emotional responses, difficulties in implementing goal-directed behaviors, lack of emotional awareness, and lack of emotional clarity (Gratz & Roemer, 2004). The DERS contains 24 items that are scored on a Likert scale (1 = “rarely”, up to 5 = “almost always”). The items, phrased as statements, are distributed across four subscales and appear in the instrument as exemplified by: “When I'm upset, I feel guilty for feeling that way.” (“Non-acceptance of emotional responses”), “When I'm upset, I have difficulty concentrating.” (“Difficulties engaging in goal-directed behaviors”), “I pay attention to how I feel.” (“Lack of emotional awareness”), and “I am confused about how I feel.” (“Lack of emotional clarity”). The Mexican version was used in this study (Marin et al., 2012), which reported favorable indicators of total internal consistency ($\alpha = .89$) and in the subscales (Non-acceptance $\alpha = .89$, Goals $\alpha = .79$, Consciousness $\alpha = .71$ and for the Clarity factor $\alpha = .68$). This scale demonstrated favorable evidence of validity and reliability in Latin American adolescents and young adults.

3.3.4 The Anger Rumination Scale (ARS)

The ARS was designed to assess anger rumination characterized by the attention focused on thoughts, memories, and past and present experiences of anger (Sukhodolsky et al., 2001). This test contains 19 items with a Likert type scale (1 = "Almost never", up to 4 = "Almost always"), which make up four subscales: Thoughts of Revenge (4 items, $\alpha = .72$), Angry Afterthoughts (6 items, $\alpha = .86$); Angry Memories (5 items, $\alpha = .85$), and Understanding of Causes (4 items, $\alpha = .77$). The items, phrased as statements, are distributed across four subscales and appear in the instrument as exemplified by: "I feel angry when I think about how I have been treated." ("Angry Afterthoughts"), "I think about ways to get even with this person." ("Thoughts of Revenge"), "Memories of being angry come to my mind when I least expect them." ("Angry Memories"), and "I try to figure out why I am still angry" ("Understanding of Causes"). The Spanish version of the study was used (Ortega-Andrade et al., 2017), in which internal consistency coefficients similar to those originally reported were reported ($\alpha = .72$ and $\alpha = .89$). This scale demonstrated favorable evidence of validity and reliability in Latin American adolescents and young adults.

3.3.5 The Acceptance and Action Questionnaire-II (AAQ-II)

This instrument was designed to obtain a general measure of experiential avoidance and psychological inflexibility. The AAQ-II is composed of seven items with a Likert type scale (1 = "Never true", up to 7 = "Always true") (Bond et al., 2011). The items, phrased as statements, appear in the instrument as exemplified by: "My painful experiences and memories make it difficult for me to live a life that I would value." and "I'm afraid of my feelings.". In this study, we used the version adapted for Colombia (Ruiz et al., 2016), which obtained an adequate internal consistency ($\alpha = .88$ and $\alpha = .91$ in population and clinical samples) and maintained the one-dimensionality of the original version of the test. This scale demonstrated favorable evidence of validity and reliability in Latin American adolescents and young adults.

3.3.6 Reactive-Proactive Aggression Questionnaire (RPQ)

This instrument was developed to assess aggression in its reactive (RA) and proactive (PA) dimensions (Raine et al., 2006). The first subscale of the RPQ assesses RA that presents high emotional activation, impulsiveness, and hostility, while the second subscale assesses PA that presents a tendency towards instrumental, planned behavior, low in empathy, and cold strategy. The RPQ contains 23 combined items (11 for RA, 12 for PA), on a Likert frequency scale (0 = "never", up to 2 = "often"). The items, phrased as statements, are distributed across two subscales and appear in the instrument as exemplified by: "Damaged things because you were mad." ("Reactive Aggression") and "Used force to get money or things from others." ("Proactive Aggression"). The Spanish language version was used for this study (Andreu et al., 2009), which obtained a favorable overall internal consistency ($\alpha = .91$) and in the subscales RA ($\alpha = .84$) and PA ($\alpha = .87$). This questionnaire demonstrated favorable evidence of validity and reliability in Latin American adolescents and young adults.

3.3.7 Normative Deviance Scale (NDS)

The NDS was designed as a multicultural measure of adolescent behavior that breaks social norms, independent of legal definitions of crime or deviance (Vazsonyi et al., 2001). The Spanish translation was used in this study, which contains 26 items with a Likert response format (0 = "Never, up to 6 = "More than 20 times"), in which actions appear that reflect the number of times minors reported hitting someone, stealing, or damaging someone else's property in the last year (Castell et al., 2000). This version of the NDS contains the Vandalism ("You have vandalized or damaged things in public places", $\alpha = .84$), School Misconduct ("You

have cheated at work or school, or altered results", $\alpha = .76$), Theft ("You have made money by threatening weaker people", $\alpha = .83$) subscales, and the general measure of General Deviance that contains behaviors such as stealing the change from the ATM, getting air out of tires, lying to get into nightclubs, making obscene phone calls, using fake coins in machines, or deliberately setting off car alarms ($\alpha = .81$). The NDS presented a total internal consistency of $\alpha = .75$. This scale demonstrated favorable evidence of validity and reliability in Latin American adolescents and young adults.

3.4 Procedure and ethical guards

Data collection was carried out within the institutional facilities that granted authorization for the study (between 2019 and 2020). For minor participants (under the age of 18), an informed consent form was sent to their parents one day prior to the evaluation; all participants submitted their signed documents before the psychometric instruments were distributed. The questionnaires were administered in paper-and-pencil format within their respective classrooms, with a completion time ranging between 20 and 30 minutes. To control for external distractions, only the participants, an investigator, and an institutional teacher were present in the physical space, with the latter two remaining available to answer any questions during the session. Prior to testing, the purpose of the study was explained, and ethical considerations—such as response anonymity, voluntary participation, and the mandatory signing of the informed consent—were clarified. The investigator explicitly stated that no compensation or reward would be provided for participation. Once the applications were completed, the collected data were tabulated, and the physical documents were placed in a private, secure storage facility.

We ensured that the Declaration of Helsinki (World Medical Association, 2013) guidelines on the well-being and rights of all participants were followed, ensuring in writing that each participant signed and agreed to an assent and informed consent document, which explicitly stated that the handling of personal data was for research purposes, guaranteeing confidentiality, the professional handling of the data obtained, and the results that would be part of a scientific publication. Within the informed consent and assent documents, the principles of risk management (deemed absent) and absolute confidentiality of responses were openly stated. Furthermore, participants were explicitly informed of their right to ask questions at any time, the strictly voluntary nature of the study, and the absence of penalties for withdrawal or refusal to participate (e.g., loss of privileges or low academic grades). Lastly, the potential benefits were outlined, specifically focusing on the social appropriation of knowledge.

3.5 Analytic strategy

Data preparation involved examining the assumptions of univariate and multivariate normality. Univariate normality was assessed for each variable using skewness and kurtosis indices, applying the thresholds of -1.7 to 1.7 for skewness and -3.5 to 3.9 for kurtosis (Lei & Lomax, 2005). Regarding multivariate normality, Mardia's coefficient was evaluated against Bollen's (1989) criterion of $p(p+2)$, where p represents the number of observed variables in the model. Evaluating these distributional properties was critical to determine the viability of traditional maximum likelihood estimation and to justify the potential implementation of robust alternative estimators for the subsequent path analysis. We verified the reliability of the scales according to Cronbach's Alpha coefficient and McDonald's coefficient omega.

Afterward, we verified the absence of multicollinearity and homoscedasticity among the variables. A multivariate correlation analysis was performed among the structural, emotional, cognitive, and symptomatic variables to verify the predictive associations

to be investigated in the SEM model. In the path analysis, using structural equations, we verified if there was a fit between the hypothetical and the empirical model, examining the consistencies in the matrix of observed covariances. For this, we used the adjustment indexes recommended by Hu and Bentler (1999) for varied samples and different distributions, such as Satorra–Bentler robust Chi-Square values ($S-B\chi^2$, cut-off point $p > .05$) a recommended statistic for normal distributions and a method of maximum likelihood; also, the Comparative Fit Index ($CFI > 0.95$), the Tucker-Lewis Index ($TLI > 0.95$), the Root Mean Square Error of Approximation (a very good fit if $RMSEA < .05$; a good fit for $RMSEA \leq .05$ and $.08$; 95% CI and p close), and the Standardized Root Mean Square Residual ($SRMR < 0.08$), were verified (Hu & Bentler, 1999; Satorra & Bentler, 2010). Next, we observed the variations of the models by the dependent variables aggression and antisocial behaviors in an analysis of the variations between the obtained models, assuming a value $p < .05$ in the χ^2 . We also reviewed the determination coefficients R^2 and β to analyze the validity of the transdiagnostic hypotheses specified in the best model. Also, based on these results, the bootstrapped direct, indirect, and total effects were calculated for significant support paths (1000 bootstrap samples), with confidence intervals using the bias-corrected percentile (Biesanz et al., 2010). Data analysis was performed using JASP 0.18.3 and RStudio Version 2025.05.1+513 through the R package *lavaan* 0.6-1 and its emulation of *Mplus* (JASP Team, 2021; Rosseel, 2012).

4. Results

4.1 Preliminary analysis

We ensured that Table 2 presents the descriptive statistics for each variable examined in the sample, including measures of central tendency and univariate distribution with expected asymmetric dispersion (ranging from -0.13 to 1.50) and kurtosis (from -0.56 to 1.60) indices (Lei & Lomax, 2005). Additionally, Table 2 displays data for each subgroup and the score differences in the variables of interest. Regarding the multivariate distribution, the kurtosis was 119.46, and skewness was 11.94 ($p < .001$); since these values exceeded $p(p+2) = 99$, multivariate normality could not be confirmed (Bollen, 1989). Therefore, the analysis was conducted using Satorra-Bentler scaled comparative values ($S-B\chi^2$), which are recommended for non-normal distributions (Satorra & Bentler, 2010).

Table 2

Descriptive Statistics by Group, Reliability Estimates, and Group Comparisons (n = 351)

Variable	Non-Internal M (SD)	Internal M (SD)	Skewness (NI / I)	Kurtosis (NI / I)	Range (NI / I)	ω (α)	t	p	d
BIS	23.19 (6.38)	24.25 (7.54)	0.10 / 0.08	-0.40 / -0.55	8–39 / 8–40	.808 (.805)	-1.42	.157	-0.15
BAS	24.52 (6.39)	25.90 (7.11)	-0.07 / -0.25	-0.54 / -0.54	10–38 / 9–40	.822 (.820)	-1.92	.055	-0.20
NA-trait	19.09 (6.31)	20.12 (7.01)	0.81 / 0.78	0.71 / 0.40	10–43 / 10–42	.793 (.791)	-1.45	.147	-0.15
DERS	50.93 (15.03)	55.44 (15.29)	0.90 / 1.04	0.52 / 0.90	25–94 / 28–103	.890 (.881)	-2.78	.006	-0.29
AR	34.69 (10.38)	38.49 (12.03)	1.01 / 0.79	1.16 / 0.26	19–72 / 19–74	.907 (.906)	-3.17	.002	-0.33
EA	16.47 (8.74)	20.29 (11.12)	1.03 / 0.63	0.63 / -0.73	7–49 / 7–49	.903 (.903)	-3.60	< .001	-0.38
RA	8.01 (4.13)	9.93 (3.84)	0.73 / 0.28	0.59 / 0.47	0–22 / 0–22	.798 (.796)	-4.49	< .001	-0.48
PA	3.59 (3.71)	8.01 (5.12)	1.78 / 0.40	4.41 / -0.44	0–23 / 0–24	.882 (.879)	-9.31	< .001	-0.99
AB	14.83 (14.61)	47.51 (38.11)	1.89 / 0.71	4.45 / -0.48	0–85 / 0–156	.965 (.964)	-10.79	< .001	-1.15

Note. M = mean; SD = standard deviation; NI = non-internal group; I = internal group; ω = McDonald's omega; α = Cronbach's alpha; d = Cohen's d .

The table also presents the differential values between the two study samples (institutionalized and non-institutionalized); statistically significant differences were found in all variables except the first three (BIS, BAS, and NA-trait with $p > .05$). Effect sizes for differences in aggression and antisocial behavior variables were moderate to high (Cohen's $d = 0.48$ and 1.15 , respectively). Other effect sizes were moderate to small, suggesting that differences aligned with expected variations between institutionalized and non-institutionalized samples, as reflected in higher scores for the institutionalized group and negative t-scores. Additionally, reliability values for all study variables were within acceptable margins for both Cronbach's alpha and McDonald's omega coefficients.

4.2 Structural transdiagnostic model

After reviewing the descriptive data of the sample, we verified multicollinearity and homoscedasticity among the variables to ensure the assumptions for linear regressions in the hypothetical transdiagnostic model. Results indicated that the model was viable for analysis with structural equations, as no bivariate correlations exceeded .90. We then proposed a preliminary, theoretically-based model in which structural, emotional, and cognitive levels were established as predictors of aggressive and antisocial behaviors. In this model, we reviewed fit indices and regression coefficients to determine the significance of each predictor variable. Table 3 presents the fit indices for this initial model, which showed a strong fit (CFI = .987, TLI = .951, RMSEA = .068, SRMR = .028). The model explained a total variance of $R^2 = .350$ for reactive aggression (RA), $R^2 = .283$ for proactive aggression (PA), and $R^2 = .172$ for antisocial behavior (AB).

Table 3

Fit Indices and Scaled Chi-Square Difference Tests for the Three Proposed Models

Model	$\chi^2(S-B)$	df	CFI	TLI	RMSEA	95% CI RMSEA	p close RMSEA	SRMR	$\Delta S-B\chi^2$	Δdf	p
Aggression & Antisocial Behavior	23.749**	9	.987	.951	.068	.037-.101	.150	.028	—	—	—
Only Antisocial Behavior	22.081**	7	.978	.943	.078	.046-.113	.074	.027	0.444	2	.801
Only Aggression	23.743**	8	.984	.951	.075	.043-.109	.094	.029	0.062	1	.803

Note. $S-B\chi^2$ = Satorra-Bentler scaled chi-square. $\Delta S-B\chi^2$ represents the scaled chi-square difference test relative to the full model. ** = $p < .01$.

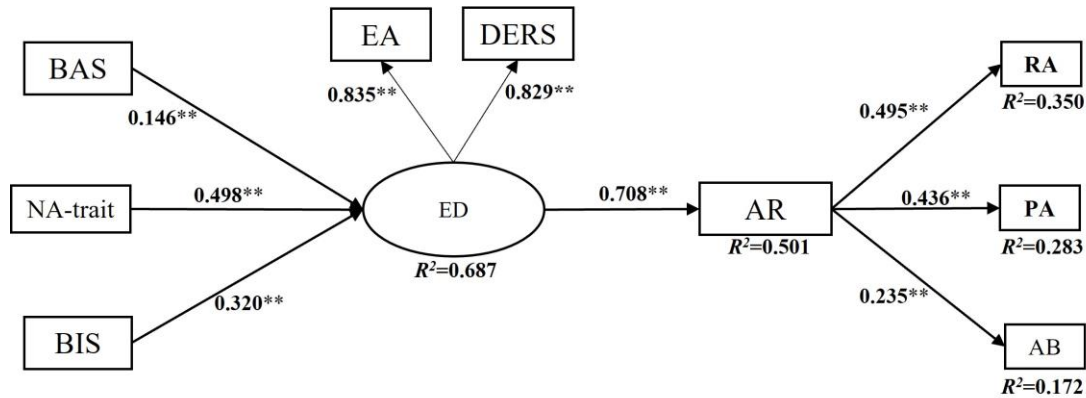
To independently assess the predictive capacity of the hypothetical model, we examined the multidimensional structure of antisocial behavior by analyzing its components separately (Santos et al., 2019). A structural equation model for antisocial behavior demonstrated an overall acceptable fit (CFI = .978, TLI = .943, RMSEA = .078, SRMR = .027). Although the TLI value fell slightly below the a priori criterion of .95, the remaining fit indices supported the adequacy of the model. Given the strong association of reactive and proactive aggression with antisocial personality disorders and other psychopathologies (e.g., Lobbetael et al., 2013; Whipp et al., 2019), we also tested a structural model for these two constructs. This model exhibited a slightly better fit (CFI = .984, TLI = .951, RMSEA = .075, SRMR = .029) than the antisocial behavior model.

The fit indices for each model indicated adequate model fit. However, comparisons of nested models revealed no significant differences between the initial model and models with reduced fit indices ($\Delta\chi^2 = 1.668$, $p = .454$; $\Delta\chi^2 = 0.006$, $p = .0685$), despite the reduction in parameters of the nested models, suggesting that the more parsimonious model has better fit indices. Therefore, the full model incorporating aggression and antisocial behavior variables was retained. As depicted in Figure 1, the structural variables (BIS/BAS, and NA-trait) significantly predict emotional dysregulation (EA and DERS). Furthermore, the model demonstrates that

rumination-anger, influenced by these structural variables, is a stronger predictor of reactive aggression (RA) and proactive aggression (PA), while showing a weaker, though still significant, predictive relationship with antisocial/delinquent behaviors (AB).

Figure 1

Structural model obtained for aggressive and antisocial behaviors



Note. The structural model obtained for aggressive and antisocial behaviors. The structural variables demonstrate a high coefficient of determination on emotional dysregulation ($R^2=.68$), as well as this set of indicators on rumination-anger ($R^2=.50$). The criterion variables in the final paths show the greatest predictive power for reactive aggression ($R^2=.35$), followed by proactive aggression ($R^2=.28$), and to a lesser but statistically significant extent for antisocial and delinquent behaviors ($R^2=.17$). ** = $p < 0.01$.

After verifying the most parsimonious model, we examined the relationships between predictor and criterion variables. Results indicated that both Behavioral Activation System (BAS) and Negative Affect (NA-trait) were positively associated with reactive aggression ($\beta = 0.215$, $p < .001$; $\beta = 0.133$, $p = .029$, respectively). However, Behavioral Inhibition System (BIS) was not significantly associated with reactive aggression ($\beta = -0.057$, $p = .308$). For proactive aggression, both BIS and BAS were significantly associated, with BIS showing a negative relationship ($\beta = -0.145$, $p = .011$) and BAS a positive relationship ($\beta = 0.280$, $p < .001$). NA-trait was not significantly associated with proactive aggression ($\beta = -0.023$, $p = .722$). These findings support the hypothesis that BAS and NA-trait are associated with reactive aggression, while high BAS and low BIS are associated with proactive aggression, independent of NA-trait.

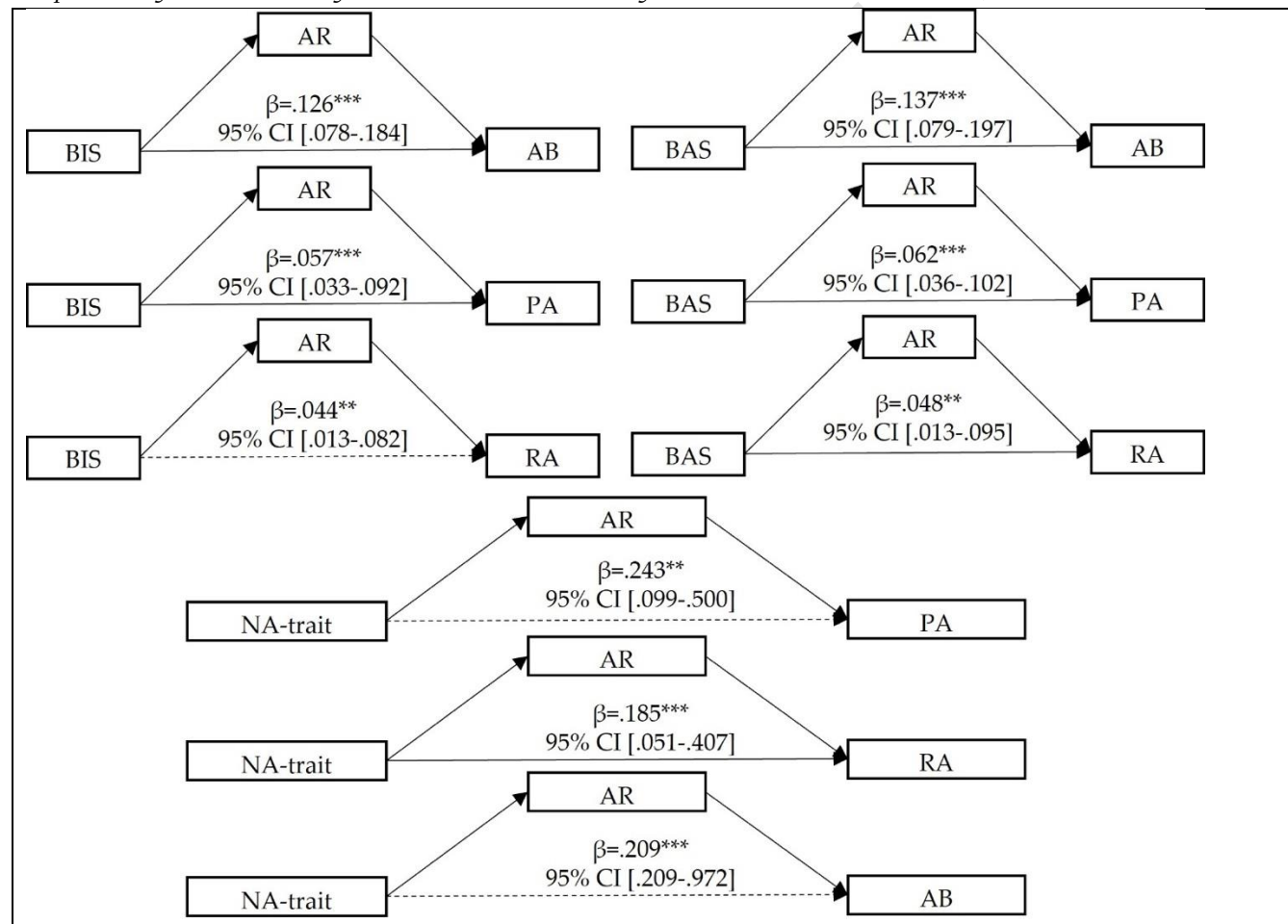
BIS and BAS were negatively and positively associated with antisocial behavior, respectively (BIS $\beta = -0.140$, $p = .028$; BAS $\beta = 0.256$, $p < .001$), while NA-trait was not significantly associated ($\beta = -0.060$, $p = .417$). These findings further support the link between BAS, BIS, and antisocial behavior. A strong positive relationship was found between emotional dysregulation (ED) and anger rumination ($\beta = 0.708$, $p < .001$). Additionally, BIS, NA-trait, and to a lesser extent, BAS, were positively associated with ED (BIS $\beta = 0.320$, $p < .001$; NA-trait $\beta = 0.498$, $p < .001$; BAS $\beta = 0.146$, $p < .001$). Furthermore, the cognitive variable of Anger Rumination (AR) was significantly associated with reactive aggression ($\beta = 0.495$, $p < .001$), proactive aggression ($\beta = 0.436$, $p < .001$), and antisocial behavior ($\beta = 0.235$, $p = .009$). These results support the hypothesized relationship between BIS, BAS, NA-trait, ED, and AR, with ED being a significant predictor of aggressive and antisocial behavior.

Finally, we reviewed the bootstrapped direct, indirect, and total effects among the predictor variables and criteria. We found significant indirect effects for BIS through AR on AB ($\beta_{indirect} = 0.126$, 95% CI [0.078, 0.184], $p < .001$), on PA ($\beta_{indirect} = 0.057$, 95%

CI [0.033, 0.092], $p < .001$), and on RA ($\beta_{indirect} = 0.044$, 95% CI [0.013, 0.082], $p = .003$). In the case of RA, the direct effect was not significant, indicating an indirect-only mediation, whereas for AB and PA the direct effects remained significant, suggesting complementary mediation. The ED variable showed no evidence of indirect effects in the BIS, aggression, and AB relationships ($p > .001$). Regarding BAS, we found significant indirect effects through AR on AB ($\beta_{indirect} = 0.137$, 95% CI [0.079, 0.197], $p < .001$), on RA ($\beta_{indirect} = 0.062$, 95% CI [0.036, 0.102], $p < .001$), and on PA ($\beta_{indirect} = 0.048$, 95% CI [0.013, 0.095], $p = .003$). The direct effects for these paths were also significant, indicating complementary mediation, while ED again showed no evidence of indirect effects ($p > .001$). Finally, the NA-trait showed significant indirect effects through AR on PA ($\beta_{indirect} = 0.243$, 95% CI [0.099, 0.500], $p = .003$), on AR itself ($\beta_{indirect} = 0.532$, 95% CI [0.209, 0.972], $p < .001$), and on RA ($\beta_{indirect} = 0.185$, 95% CI [0.051, 0.407], $p < .001$). For PA and AR, the direct effects were not significant, indicating indirect-only mediation, whereas for RA the direct effect remained significant, suggesting complementary mediation. In this analysis, ED obtained no evidence of indirect effects ($p > .001$; see Figure 2).

Figure 2

Complementary and Indirect-Only Mediations Between Transdiagnostic Variables



Note. Mediation effects between BIS/BAS (top) and NA-Trait (bottom), anger rumination (AR), and antisocial outcomes, including reactive aggression (RA), proactive aggression (PA), and antisocial and delinquent behaviors (AB). Values represent standardized indirect effects (β) and 95% confidence intervals (95% CI). Solid lines indicate complementary mediation, and dashed lines indicate indirect-only mediation. ** = $p < 0.01$; *** = $p < 0.001$.

5. Discussion

The objective of the study was to elaborate a preliminary explanatory multivariate model of the structural, emotional and cognitive variables that are at the base of aggressive and antisocial behaviors in adolescence and youth. Firstly, the hypothesis raised around the predictive capacity of the identified transdiagnostic constructs, according to the analysis of the differences in the average score between the incarcerated in the detention centers and the students without deprivation of liberty. This data allowed us to obtain evidence of significant differences with moderate and high effect sizes, except in the base variables BIS, BAS, and NA-trait ($p > .05$). Interactions that suggest that they can become indicators of vulnerability to aggressive and antisocial behavior, in a model composed of transdiagnostic variables although emotional variables such as emotional dysregulation, experiential avoidance, and cognitive rumination have the greatest explanatory capacity.

These comparative values are consistent with previous reports on the predictive ability of these transdiagnostic variables in predicting aggressive and antisocial behavior in adolescents and young adults (Donahue et al., 2014; Wang et al., 2018). The findings suggest that people who have difficulty controlling their emotions, either through impulsive or avoidant behaviors, and who present ruminative thinking around the emotion of anger, would be more vulnerable to aggressive and antisocial behaviors during adolescence and youth. This is evident in the statistically significant differences observed in measures of reactive, proactive, and antisocial behaviors ($p < .001$, Cohen's d between 0.48 and 1.15). Additionally, institutionalized participants showed significantly higher levels of both emotional dysregulation and anger rumination. Because differences were particularly pronounced for emotional dysregulation, the findings suggest that the influence of the correctional environment may be partly associated with difficulties in emotional regulation. This is consistent with theoretical models proposing that contextual adversity increases vulnerability to emotional dysregulation, which in turn facilitates maladaptive cognitive processes such as anger rumination and subsequent aggressive behavior.

Secondly, we tested a transdiagnostic model in which BIS and BAS were specified as predictors of antisocial behaviors, with emotional dysregulation and anger rumination as sequential mediators. Our findings suggest that these neurobiological variables exert an indirect effect on antisocial outcomes through the proposed mediating pathways. In this regard, evidence was obtained for the elevated relationship between inhibition-behavioral activation, and the negative affect trait, with emotional dysregulation and anger rumination, these data confirm the role of sensitivity to reward and punishment in the regulation of emotions and cognition (Hundt et al., 2013; Merchán-Clavellino et al., 2019; Scaini et al., 2025). Furthermore, these data suggest that high levels of emotional reactivity coupled with high inhibition of responses, may favor emotional dysregulation, and therefore, this combination could increase vulnerability to dysfunctional behaviors such as aggressive or antisocial behavior (Merchán-Clavellino et al., 2019).

Given the values obtained, it is assumed that negative affect and inhibition systems are associated with reactive aggression, while high behavioral activation and low inhibition were associated with proactive aggression and antisocial behaviors. These findings are consistent with previous reports on the predictive capacity of reward systems in externalizing problems (Subramanian et al., 2022), and BAS-type sensitivity as a multidimensional construct (Leone & Russo, 2009; Taubitz et al., 2015; Włodarska et al., 2021). Concerning BIS, these results support the role of these two motivational factors based on the sensibility to reinforcement, in explaining emotion-related impulsivity and low inhibitory response capacity in aggression. It was reported in previous studies that highlight the explanatory capacity of BIS (Madole et al., 2019) and provide evidence for models in which reactivity to emotion appears

on an internalizing - externalizing psychopathological continuum and high - low emotional control (Carver & Johnson, 2018; Ramer et al., 2024).

Meanwhile, high BAS appears to have a significant predictive role in the models reviewed, although low with emotional dysregulation, suggesting that this variable associated with sensitivity to reinforcement and procedural mechanisms of reward, predicts with greater explained variance the cognitive responses associated with anger and aggressive and antisocial behaviors, as suggested by the conclusions of previous studies (Broerman et al., 2014; Khoshfetrat et al., 2022; Verona & Bresin 2015). These findings suggest new directions in research advances in integrative models both neurobiological, symptomatic, and contextual (e.g., RDoC), around the role of the structural variables BIS, BAS, and NA-trait as keys to the motivational understanding of approach or avoidance behaviors, as well as negative emotionality, within a preliminary transdiagnostic model.

At a theoretical level, previous reports have suggested the role of regulatory variables of emotional and behavioral response, not only investigating the role of experiential avoidance in externalizing behavior problems but also others of greater explanatory scope, such as effortful control and executive function. For example, experiential avoidance has been reported to be an emotional regulatory function involving behavioral avoidance, cognitive reevaluation, and response suppression (Wolgast et al., 2013). In other reports, as suggested in this formulated model, it has been indicated that adolescents who are predisposed to emotional dysregulation because of their low tolerance for discomfort and high experiential avoidance will have a worsening of symptoms (Scaini et al., 2025; Schramm et al., 2013), as it is a strategy to avoid aversive private experiences (discomfort intolerance) that increase emotional dysregulation (Jones et al., 2019), which could increase the probability of aggressive and antisocial behaviors, as estimated according to the determination values obtained.

The model we obtained suggests that, in addition to difficulties in emotional and behavioral regulation, the role of anger rumination as an antecedent to aggressive and antisocial responses, appears to have a high predictive capacity. These results corroborate previous reports on the importance of this transdiagnostic variable and its relationship with executive functions (du Pont et al., 2019), aggressive reactive and proactive behaviors (Wang et al., 2018), relational aggression (Harmon et al., 2017), and secondary psychopathy in young adults (Guerra & White, 2017). In turn, anger rumination appears to increase hostility and anger responses, primarily in aggressive responses (Scaini et al., 2025; White & Turner, 2014). It can be stated that at a transdiagnostic level, anger rumination is due to deficiencies in executive functions, especially the metacognitive skills needed to regulate emotions (Friedman & Miyake, 2017). If they fail, the psychopathological risk increases (du Pont et al., 2019), by interrupting executive processes such as inhibition and negative self-focus (van Vugt & van der Velde, 2018). However, evidence on the explanatory capacity of anger rumination, regardless of executive functions, is scarce and requires further investigation (du Pont et al., 2017). We consider that these deficiencies in executive functions are due to the variations obtained in the ages of the participating groups, which suggests that for further research, it is necessary to consider the role of age as a moderating variable in this association in the transdiagnostic model obtained.

5.1 Recommendations for action

These findings carry direct implications for clinical and forensic psychology internationally, with relevance for public policies regarding the care of juvenile offenders and mental health systems. The transdiagnostic model presented here provides additional evidence supporting the need for a shift in understanding externalizing delinquent and antisocial behavior problems, moving beyond

symptom-based classification toward assessment and intervention approaches grounded in transdiagnostic mechanisms, as promoted by the Research Domain Criteria (RDoC) framework (Bell et al., 2021).

From a clinical psychology perspective, the present findings support evaluating the inclusion of emotion-regulation components within mental health programs for adolescents who exhibit reactive aggression and related behavioral difficulties, as difficulties in emotion regulation have been consistently associated with aggressive behavior across clinical populations, including incarcerated adolescents (Soares et al., 2026). Furthermore, from a forensic standpoint, public policies may benefit from incorporating transdiagnostic assessment tools that address the psychological processes underlying behavioral problems—processes that are often critical targets for intervention during key developmental stages (Kilbane et al., 2025).

The findings of the present study have important implications for mental health professionals working with justice-involved adolescents, highlighting the potential value of strengthening emotional and behavioral regulation skills. Evidence-based interventions such as Dialectical Behavior Therapy for adolescents (McCauley et al., 2018), Aggression Replacement Training (Brännström et al., 2016), and other approaches focused on emotion regulation and cognitive-behavioral skills development may represent promising avenues for addressing emotional dysregulation and aggressive behavior. Within the rehabilitative framework established by the National Law of the Comprehensive Juvenile Criminal Justice System (México, Congreso de la Unión, 2016), such interventions may contribute to reducing criminogenic risk factors and facilitating successful social reintegration.

Such an approach could enhance the impact of international mental health policies focused on adolescents and young adults under conditional release and in community settings. Consequently, the development of explanatory models such as the one presented in this study may inform future transdiagnostic intervention strategies specifically tailored for youth exhibiting aggressive, delinquent, and antisocial behaviors, with the potential to contribute to the prevention of persistent patterns of criminal behavior.

5.2 Limitations and future directions

The development of the study had some limitations to be acknowledged. Firstly, cross-sectional designs as a strategy for the development of models with predictive capacity often present difficulties in interpreting the causality of the phenomenon, unlike longitudinal designs applied to models with structural equations that usually incorporate factor invariance at different times, and include the moderation of the temporal component, among other strategies (Hamaker et al., 2018). We recommend further studies to incorporate these measures and complementary statistical analyses to evidence a greater precision of the proposed model.

Additionally, participants in the institutionalized group were older on average ($M = 19.16$, $SD = 3.09$) than participants in the non-institutionalized group ($M = 16.58$, $SD = 2.59$). This age difference should be considered when interpreting the findings because age-related developmental changes may influence emotional regulation, aggression, and antisocial behavior, potentially affecting the observed group differences and the predictive capacity of the proposed models. We recommend for new studies, analyzing the moderating role of belonging or not to a center for minors or adults who are incarcerated. As well as carrying out a multi-group SEM analysis, using this condition as a grouping variable, checking the invariance indicators in the nested groups.

Another limitation of the present study concerns the differential predictive capacity of the proposed transdiagnostic model. Specifically, the model appeared to explain aggressive behavior more effectively than antisocial behavior, which may be partly attributable to limitations in the assessment of antisocial conduct (Whipp et al., 2019). Measures of antisocial behavior are often affected

by social desirability, low base-rate responding, and pronounced positive skewness, all of which may reduce measurement precision and attenuate associations among variables. Future studies should therefore incorporate multiple indicators of antisocial behavior and complementary psychopathological measures to improve construct validity and enhance the explanatory power of the model.

An additional limitation relates to potential sources of unexplained variance arising from the absence of information regarding the types of offenses committed by institutionalized participants. Likewise, age was not included as a covariate in the final structural model, despite its potential influence on emotional regulation, aggression, and antisocial behavior. Future research should examine whether these variables modify the structural relations observed in the present study. Finally, the exclusive inclusion of male participants limits the generalizability of the findings to female populations. Previous research suggests that aggressive and antisocial behaviors may differ between males and females in their behavioral expression, emotional regulation processes, and underlying vulnerability factors, including the Behavioral Inhibition and Behavioral Activation Systems (BIS/BAS) and negative affectivity. Consequently, additional studies involving female adolescent offenders are needed to determine whether the proposed transdiagnostic model can be replicated across sex.

In this way, the clinical implications of including variables such as BIS and BAS from the Gray's Reinforcement Sensitivity Theory (RST), can provide a necessary theoretical framework for understanding the underlying mechanisms of these problems. However, further research is required among the contributions that BIS and BAS provide separately in different psychological disorders, verifying the variance explained for each DSM V clinical diagnosis in the different antisocial disorders. It has been recommended to deepen the differences between primary and secondary psychopathy in terms of the role of BIS in the avoidance of punishment and BAS in reward gain (Ramer et al., 2024; Wallace & Newman 2008), this field of research at the explanatory level still requires further development in wide-ranging studies in psychopathological theory. These advances at a methodological level will allow researchers to generate new hypotheses about the transdiagnostic mechanisms underlying these disorders, especially those related to variables of wide explanatory variance (such as BIS and BAS, or P-Factor, or NA-trait as Neuroticism). At the same time, this will allow a functional review of the role of emotional dysregulation and rumination in the appearance and modulation of aggressive symptoms that deviate from the norm (Toro et al., 2020; Toro et al., 2021), by means of longitudinal follow-up studies and growth of latent curves (Rosel & Plewis, 2008).

6. Conclusions

To conclude, the model presented represents progress in the study of antisocial psychopathologies, particularly those presenting aggressive and antisocial behavior. In this new model, evidence was obtained for structural variables (behavioral inhibition and activation, and negative affectivity as a trait), associated with difficulties in emotional regulation and anger rumination, as statistically significant predictors of antisocial behaviors. Specifically, the BIS/BAS motivational systems and NA-trait operate as vulnerability factors associated with emotional dysregulation, which acts as a transdiagnostic mechanism linking these factors to anger rumination and, ultimately, to externalizing behaviors. In turn, anger rumination partially mediates the effect of emotional dysregulation on aggressive and antisocial behaviors, serving as a cognitive process associated with the persistence and intensification of aggressive responses. Finally, evidence was generated of the predictive capacity of transdiagnostic variables in a set that will allow the advancement of understanding based on the RDoC model, and future new directions in research are encouraged that will contribute to further progress towards the improvement of currently available treatments.

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Statements

Originality Statement: This article is based on work that was previously made publicly available as a preprint in *Preprints.org* entitled: Behavioral Inhibition and Activation Systems, Negative Affect, Dysregulation and Anger Rumination as Explanatory Variables of Aggressive and Antisocial Behaviors [<https://doi.org/10.20944/preprints202411.2033.v1>]. This prior version has not undergone formal peer review as a journal article. The version published in *IJP&PP* includes substantive revisions: (1) updated mediation analyses with bootstrapped confidence intervals and contemporary mediation terminology (indirect-only and complementary mediation); (2) revised theoretical discussion aligned with the RDoC framework; (3) conceptual clarification of the sequential pathway from neurobiological vulnerability to emotional dysregulation, anger rumination, and externalizing behaviors; and (4) overall improvements in clarity, coherence, and academic style throughout the manuscript. The repository record will be updated to include a reference to this final published version of the article.

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Informed Consent Statement: Informed consent was obtained from all participants aged 18 years or older. For participants under 18 years of age, written informed consent was obtained from their parents or legal guardians, and assent was obtained from the adolescents prior to participation in the study.

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