

Association between parenting styles and the learning process of adolescents

Associação entre estilos parentais e processo de aprendizagem de adolescentes

Asociación entre estilos parentales y el proceso de aprendizaje de los adolescentes

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Abstract

This study investigates the association between parenting styles and the learning process and cognitive performance of attention and memory in adolescents aged 12 to 15 years. This is an exploratory and descriptive research that used brief neuropsychological assessments to measure adolescents' performance, divided into two groups according to parenting styles: positive (PPS) and negative (NPS). The results indicated that adolescents exposed to negative parenting styles showed poorer performance in sustained attention, short-term memory, and learning. We conclude that positive parenting practices are associated with better cognitive and learning outcomes, while negative practices can harm the development of these adolescents.

Keywords: Parenting styles. Learning. Attention. Memory.

Resumo

Este estudo investiga a associação entre estilos parentais e o processo de aprendizagem e desempenho cognitivo de atenção e memória em adolescentes de 12 a 15 anos. Trata-se de uma pesquisa exploratória e descritiva que utilizou avaliações neuropsicológicas breves para mensurar o desempenho dos adolescentes, os quais foram divididos em dois grupos de acordo com os estilos parentais: positivos (EPP) e negativos (EPN). Os resultados indicaram que os adolescentes expostos a estilos parentais negativos apresentaram desempenho inferior em atenção concentrada, memória de curto prazo e aprendizagem. Conclui-se que práticas parentais positivas estão associadas a melhores



resultados cognitivos e de aprendizagem, enquanto práticas negativas podem prejudicar o desenvolvimento desses adolescentes.

Palavras-chave: Estilos parentais. Aprendizagem. Atenção. Memória.

Resumen

Este estudio investiga la asociación entre los estilos parentales y el proceso de aprendizaje y desempeño cognitivo de la atención y la memoria en adolescentes de 12 a 15 años. Se trata de una investigación exploratoria y descriptiva que utilizó evaluaciones neuropsicológicas breves para medir el desempeño de los adolescentes, quienes han sido divididos en dos grupos según los estilos parentales: positivos (EPP) y negativos (EPN). Los resultados indicaron que los adolescentes expuestos a estilos parentales negativos presentaron rendimiento inferior en atención concentrada, memoria a corto plazo y aprendizaje. Se concluye que las prácticas parentales positivas están asociadas a mejores resultados cognitivos y de aprendizaje, mientras que las prácticas negativas pueden perjudicar el desarrollo de estos adolescentes.

Palabras clave: Estilos parentales. Aprendizaje. Atención. Memoria.

1 Introduction

1.1 Parenting styles

Parenting styles refer to the strategies used by parents and caregivers in raising their children. Baumrind (1991) categorized these into three main types: authoritative, authoritarian, and permissive. The authoritative style balances demandingness and responsiveness, maintaining clear and high expectations while showing empathy and support for the child's emotional needs. This approach promotes self-esteem, autonomy, and social competence (Huçalo; Ivatiuk, 2017). The authoritarian style, on the other hand, is characterized by high demands and low responsiveness, enforcing rigid rules and limiting bidirectional communication, which may hinder self-confidence and long-term social skills (Cid *et al.*, 2015). The permissive style involves high responsiveness and low demands, with few boundaries, prioritizing the child's free expression but potentially leading to difficulties regarding self-regulation and compliance to rules (Bolsoni-Silva *et al.*, 2016).

Consistent parenting practices significantly influence child behavior, particularly in hindering antisocial behaviors. The consistent application of rational discipline, with clear explanations and logical consequences, contributes to internalizing social expectations, fostering empathy and problem-solving skills (Böing; Crepaldi, 2016; Bolsoni-Silva; Loureiro, 2019). Conversely, a lack of supervision and excessive use of physical or verbal punishments

may encourage antisocial behaviors, thus weakening parent-child bonds and promoting aggression as a conflict resolution strategy (Noronha; Batista, 2017).

1.2 Positive educational practices

Positive educational practices, associated with the authoritative parenting style, foster a child's healthy development through support, guidance, and positive reinforcement. Authoritative parents combine high expectations with strong emotional support, encouraging open communication and dialogue. This approach enhances self-esteem, independence, and social competence, while positive reinforcement—by recognizing and rewarding appropriate behaviors—encourages their repetition without the need for severe punishments (Bolsoni-Silva; Loureiro, 2019; Martins *et al.*, 2016). Establishing clear and consistent boundaries creates a secure environment, allowing the child to understand the relationship between their actions and consequences, thereby fostering personal responsibility (Schavarem; Toni, 2019). Empathy, peaceful conflict resolution, and effective communication skills help instill these values in children.

Positive monitoring, a central element of the authoritative style, involves attentive parental supervision of a child's activities and relationships while preserving their autonomy. Open communication encourages experience-sharing, which strengthens trust and enables more appropriate guidance (Rios *et al.*, 2016). Effective monitoring balances supervision and regard for independence, particularly during adolescence, by setting clear rules and consistent boundaries (Kanamota *et al.*, 2017). Careful observation and open dialogue help prevent negative behaviors, supporting decision-making skills and the internalization of values (Santos; Wachelke, 2019).

Children's moral development is also influenced by the authoritative parenting style, which balances demands with responsiveness. Dialogue and rule explanations facilitate the internalization of moral principles, promoting higher levels of moral reasoning where empathy and mutual respect are fundamental (Noronha; Batista, 2017). Consistency and fairness reinforce the understanding of equity and justice. Conversely, excessively authoritarian or permissive styles may hinder moral development, focusing more on punitive consequences than on understanding ethical principles (Böing; Crepaldi, 2016; Bolsoni-Silva *et al.*, 2016).

1.3 Negative educational practices

Negative educational practices are primarily associated with authoritarian and permissive parenting styles. The authoritarian style, characterized by high demands and low responsiveness, prioritizes rigid rules and obedience without dialogue, which may lead to low self-esteem and difficulties in social skills, as children comply out of fear rather than understanding (Schavarem; Toni, 2019; Martins *et al.*, 2016). On the other hand, the permissive style, defined by the absence of clear limits and inconsistent consequences, may impair the development of self-control and the ability to cope with frustration, affecting social adaptation (Bolsoni-Silva, 2017; Rios *et al.*, 2016).

Physical abuse, linked to extreme authoritarian practices, focuses on strict discipline at the expense of emotional well-being, leading to significant psychological and social consequences, such as anxiety and post-traumatic stress disorders (Kanamota *et al.*, 2017; Santos; Wachelke, 2019). Children exposed to abuse may develop a distorted perception of interpersonal relationships, perpetuating cycles of violence and family dysfunction. Combating this practice requires approaches that include parental education, family support, and public policies focused on child protection (Cid *et al.*, 2015).

Lax discipline, common in permissive styles, is characterized by a lack of establishing limits and inconsistent rule enforcement, which can result in problems with self-control, social adaptation, and conflict resolution (Martins *et al.*, 2016). This approach prevents children from adequately assessing the consequences of their actions and compromises their long-term emotional and moral development (Schavarem; Toni, 2019; Noronha; Batista, 2017).

Negative monitoring, which is typical of authoritarian styles, involves excessive supervision and strict control, creating tense environments and limiting the child's autonomy (Kanamota *et al.*, 2017). This can damage self-esteem and increase the likelihood of deviant behaviors, while also encouraging secrecy and lack of self-regulation (Huçalo; Ivatiuk, 2017). Balancing control and support is essential for fostering a healthy developmental environment (Santos; Wachelke, 2019).

Parental neglect is characterized by insufficient attention to the child's emotional and physical needs, and may lead to developmental delays, academic difficulties, and behavioral problems (Noronha; Batista, 2017; Bolsoni-Silva; Loureiro, 2019). The impact of neglect can extend into adolescence and adulthood, contributing to psychological disorders and difficulties

in interpersonal relationships. Early interventions by healthcare professionals and educators are essential to breaking cycles of neglect (Böing; Crepaldi, 2016).

Inconsistent punishment, a common practice in parenting styles lacking a clear structure, hinders children's understanding of expectations and norms, causing feelings of injustice and confusion (Rios *et al.*; 2016). The absence of consistency weakens parental authority and increases children's tendency to test boundaries (Kanamota *et al.*, 2017). Maintaining clear expectations and consistent consequences is essential for healthy emotional and social development (Cid *et al.*, 2015).

1.4 Learning and cognitive processes

Parenting styles significantly impact learning processes and intellectual efficiency. Authoritative parenting, which combines emotional support with clear boundaries, creates an environment that encourages exploration and critical thinking, fostering curiosity and problem-solving skills (Huçalo; Ivatiuk, 2017). Authoritarian styles, in contrast, with rigid rules and little autonomy, can stifle intrinsic motivation and limit the development of complex intellectual competencies, while excessive permissiveness results in a lack of direction and structure (Schavarem; Toni, 2019).

1.4.1 Intellectual efficiency

Learning is enhanced in authoritative environments that combine emotional support with high expectations, providing opportunities for curiosity and cognitive development (Missio; Rivas, 2019). Conversely, authoritarian styles may restrict exploration, and permissive styles fail to provide the necessary structure (Gonçalves; Ferreira, 2020).

Intellectual efficiency, which involves problem-solving and mental flexibility, is maximized in environments that balance emotional support and cognitive challenges. Authoritative styles create fertile ground for developing these abilities, whereas overly rigid or permissive styles may restrict opportunities for intellectual exploration (Kanamota *et al.*, 2017).

1.4.2 Attention

Attention is a fundamental cognitive function shaped by parenting styles. Authoritative parenting, which balances support and boundaries, promotes sustained attention by providing structure and predictability (Bolsoni-Silva, 2017). Excessive rigidity or leniency, contrary to that, may impair this ability, leading to anxiety or lack of focus (Huçalo; Ivatiuk, 2017).

Authoritative styles also support the development of alternating and divided attention, as they encourage cognitive flexibility and the ability to manage multiple tasks simultaneously (Huçalo; Ivatiuk, 2017). More rigid or permissive styles may limit these abilities by either restricting autonomy or failing to provide the necessary structure for cognitive challenges (Bolsoni-Silva; Loureiro, 2019).

Sustained attention, defined as the ability to concentrate intensely on a task, is more developed in authoritative environments that provide both support and clear limits. Authoritarian environments, in contrast, may cause pressure and anxiety, while permissive environments fail to offer the necessary structure (Santos; Wachelke, 2019).

1.4.3 Memory

Authoritative parenting, which balances emotional support and challenges, enhances information retention and long-term memory consolidation. Parents who encourage problem-solving and discussions contribute to activating neural networks associated with memory (Bolsoni-Silva; Loureiro, 2019). Authoritarian styles, on the other hand, emphasize rote memorization without conceptual understanding, thus hindering learning (Schavarem; Toni, 2019).

Working memory is responsible for the temporary manipulation of information and develops in environments that balance support and challenge, such as authoritative parenting. Parents who provide cognitive stimulation and challenging activities enhance working memory, promoting its use in academic settings (Bolsoni-Silva, 2017).

Short- and long-term memory are influenced significantly by parenting styles. Authoritative environments offer rich stimuli and support, facilitating information retention and cognitive development (Rios *et al.*, 2016). Authoritarian or permissive styles may hinder the development of these skills by failing to provide either sufficient challenges or adequate support (Noronha; Batista, 2017).

1.5 The present study

The objective of this study was to investigate the association between parenting styles and the learning process, as well as the cognitive performance of attention and memory in adolescents aged 12 to 15 years. The study's hypotheses are:

- ***H₀**: There is no statistically significant difference between the groups with negative parenting styles (NPS) and positive parenting styles (PPS) regarding cognitive performance in attention, memory, and learning.*
- ***H₁**: The group exposed to NPS demonstrates statistically lower learning performance compared to the group exposed to PPS.*
- ***H₂**: The group exposed to NPS demonstrates statistically lower cognitive performance (attention and memory) compared to the group exposed to PPS.*

2 Method

2.1 Study design

This exploratory and descriptive study characterized the sociodemographics and identified the parenting styles in the family environment of adolescents aged 12 to 15 years. Brief neuropsychological assessments were conducted to describe the participants' learning performance and cognitive abilities related to attention and memory.

2.2 Participants

The G*Power software version 3.1.9.7 was used to conduct a priori statistical analysis to estimate the sample size for the study. The parameters applied were alpha (α error prob) = 0.05, medium effect size ($d = 0.70$), and power ($1 - \beta$ error prob) = 0.80, resulting in an estimated sample size of approximately $N = 68$ (NPS, $n = 34$; PPS, $n = 34$) for an independent samples t -test for equality of means.

The final sample was selected through convenience sampling and consisted of 65 adolescents, aged 12 to 15 years, of both sexes, enrolled in public state schools and residing in suburban regions of the Midwest of Brazil. The participants were divided into two groups based on their parenting style evaluations: NPS ($n = 35$) and PPS ($n = 30$).

2.3 Inclusion and exclusion criteria

The inclusion criteria for the study were: adolescents aged 12 to 15 years, enrolled in state public schools in Mato Grosso do Sul, Brazil, with parental consent provided through signing the Informed Consent Form (ICF), and who completed the sociodemographic questionnaire.

The exclusion criteria involved adolescents who had a diagnosis of mental disorders or neurological conditions (self-reported by their guardians), had experienced traumatic events in the past six months, were using psychotropic medication, were substance-dependent, or lived in foster care institutions.

2.4 Instruments

The researchers developed and used a sociodemographic questionnaire to characterize the participants and their families.

2.4.1 Parenting Style Inventory

The Parenting Style Inventory (PSI) (Gomide, 2006) consists of 42 questions that adolescents answer based on the frequency with which their mother or father acts in specific situations described in the statements. Responses are classified as follows: *Never* (0 to 2 times out of 10 occasions), *Sometimes* (3 to 7 times out of 10 occasions), and *Always* (8 to 10 times out of 10 occasions). The questions are distributed across seven parenting practices: (A) *Positive Monitoring*, (B) *Moral Behavior*, (C) *Neglect*, (D) *Inconsistent Punishment*, (E) *Lax Discipline*, (F) *Negative Monitoring*, and (G) *Physical Abuse*, with six questions for each variable. The scoring follows the indicated frequency: *Never* = 0 points, *Sometimes* = 1 point, and *Always* = 2 points. Data tabulation is conducted based on the response sheet, which covers the seven educational practices.

2.4.2 Wechsler Abbreviated Scale of Intelligence

The Wechsler Abbreviated Scale of Intelligence (WASI) (Wechsler, 2014) was used to assess total IQ. The WASI is a brief and reliable measure of general cognitive ability, designed to evaluate intelligence in individuals aged 6 to 90 years. It consists of four subtests assessing

different aspects of intelligence: *Vocabulary*, which evaluates verbal ability and conceptual understanding through the definition of orally presented words; *Similarities*, in which the participant identifies similarities between pairs of words or concepts, assessing abstract reasoning and verbal comprehension; *Matrix Reasoning*, which measures nonverbal reasoning and problem-solving ability by identifying patterns in a series of figures; and *Block Design*, which evaluates visuospatial skills and the ability to mentally manipulate three-dimensional objects, requiring the participant to recreate visual patterns using building blocks. The test was administered individually and lasted approximately 30 to 45 minutes.

2.4.3 Rey Auditory Verbal Learning Test

The Rey Auditory Verbal Learning Test (RAVLT) (Malloy-Diniz, 2012) was used to investigate learning and memory processes (short- and long-term memory). The RAVLT consists of a list of 15 common words presented across five learning trials (List A), followed by a distractor list (List B) and a free recall trial. After a predetermined interval, the participant was asked to recall the original list again. The examiner presented the words from List A at a constant rate of one word every two seconds, instructing the participant to repeat aloud all the words they could remember after each learning trial. The RAVLT allows for a comprehensive assessment of verbal memory, including learning capacity, retention, and recall. The participant's performance in each phase of the test provides insight into different aspects of verbal memory, such as encoding, storage, and retrieval.

2.4.4 Psychological Battery for Attention Assessment

The Psychological Battery for Attention Assessment (BPA) (Rueda, 2013) is a neuropsychological tool designed to investigate different dimensions of attention in children and adults. The BPA provides a comprehensive and standardized assessment of attention, including sustained attention, which measures the ability to maintain focus and concentration on a task over time without being distracted by irrelevant stimuli; alternating attention, which assesses the ability to shift focus between different sets of stimuli or tasks quickly and efficiently; and divided attention, which evaluates the ability to process multiple stimuli or perform multiple tasks simultaneously.

2.5 Ethical aspects

This study was approved by the Research Ethics Committee under protocol number CAAE: 58572522.8.0000.5508, complying with the ethical principles established in Resolution nº 466, of December 12, 2012, and Resolution nº 510, of April 7, 2016. The study adhered to ethical guidelines, ensuring the participants' dignity and autonomy.

2.6 Procedures

The data and information collected were used exclusively for this research and for scientific papers, ensuring the participants' anonymity. The research team, composed of undergraduate psychology students in their 8th semester, was trained, guided, and supervised to conduct the brief neuropsychological assessments.

The participating schools provided suitable and confidential locations for conducting the interviews and assessments. Transportation assistance was not necessary as the assessments took place within the schools themselves, and all participants lived nearby. The formal invitation to the schools was made by the lead researcher, and data collection began after acceptance.

After receiving the ethics committee approval and completing the research team training, we contacted the students' guardians by phone or WhatsApp and presented the study's objectives and the benefits of participation. Following this, we schedule assessment appointments.

2.6.1 Data collection steps

The first session (step 1) was scheduled for reading and explaining the study's objectives, describing the assessment process, and obtaining signed Informed Consent Forms (ICF) from the guardians and Assent Forms from the adolescents. After obtaining consent, the sociodemographic questionnaire was administered, followed by the first stage of the assessment. At the end of step 1, a second session was scheduled to conduct step 2. After completing all assessments, we conducted a feedback interview with the guardian to communicate the results.

2.6.2 Step 1 – Instrument administration protocol

- i) Rey Auditory Verbal Learning Test (RAVLT) – Part 1 (~15 minutes)
- ii) RAVLT – Part 2 – recall (~5 minutes)
- iii) Alternating Attention Test – BPA (~5 minutes)
- iv) Divided Attention Test – BPA (~5 minutes)
- v) Sustained Attention Test – BPA (~5 minutes)

2.6.3 Step 2 – Instrument administration protocol

- i) Wechsler Abbreviated Scale of Intelligence (WASI) (~60 minutes)
- ii) Parenting Style Inventory (PSI) (~20 minutes)

2.7 Data analysis

The results were analyzed using the Statistical Package for the Social Sciences (SPSS) – IBM SPSS Statistics for Windows, version 23 (IBM Corp., São Paulo, SP, Brazil). Differences between the NPS and PPS groups were examined through an independent samples *t*-test, comparing means to determine whether there were statistically significant differences between the groups regarding learning, attention, memory, and IQ variables.

The following assumptions were checked and met: normality, verified through histograms and the Shapiro-Wilk test for the distribution of dependent variables in each group; and homogeneity of variances, assessed using Levene's test. The results were interpreted considering the *p*-value obtained, effect size (Cohen's *d* coefficient), and 95% confidence intervals. Effect size was classified as small ($d \geq 0.20$ and < 0.50), medium ($d \geq 0.50$ and < 0.80), and large ($d \geq 0.80$) (Cohen, 2013).

Pearson correlation analyses (*r*) were conducted to verify associations between variables within each group. The magnitude of the coefficients was interpreted as weak (0.1–0.3), moderate (0.4–0.6), or strong (≥ 0.7) for both positive and negative significance (Dancey; Reidy, 2011). A *p*-value < 0.05 was considered significant for all statistical analyses in this study.

3 Results

Table 1 presents the participants' sociodemographic characteristics categorized by negative parenting styles (NPS, $n = 35$) and positive parenting styles (PPS, $n = 30$). In the NPS group, the predominant characteristics were: age 14 years ($n = 12$, 34.3%), education level from 6th to 9th grade ($n = 30$, 85.7%), attendance at public schools ($n = 35$, 100%), four or more people in the household ($n = 28$, 80%), family income between 1 and 3 minimum wages ($n = 16$, 45.7%), and guardians with high school education ($n = 15$, 42.9%). The gender distribution was 51.4% male and 48.6% female.

In the PPS group, the predominant characteristics were similar: age 14 years ($n = 10$, 33.3%), education level from 6th to 9th grade ($n = 23$, 76.7%), attendance at public schools ($n = 29$, 96.6%), four or more people in the household ($n = 18$, 60%), family income between 1 and 3 minimum wages ($n = 14$, 46.7%), guardians with high school education ($n = 17$, 56.7%), and 56.7% male participants ($n = 17$).

Table 1 – Sociodemographic characteristics of participants ($n = 65$).

		NPS ($n = 35$)		PPS ($n = 30$)	
		n	%	n	%
Sex					
	Male	18	51.4	17	56.7
	Female	17	48.6	13	43.3
Age					
	12 years old	5	14.3	9	30.0
	13 years old	9	25.7	6	20.0
	14 years old	12	34.3	10	33.3
	15 years old	9	25.7	5	16.7
Education level (adolescent)					
	1st to 5th grade	1	2.9	2	6.7
	6th to 9th grade	30	85.7	23	76.7
	High school	4	11.4	5	16.7
School type (Guardian)					
	Public school	35	100	29	96.6
	Private school	0	0	1	3.3
Household size					
	2 people	2	5.7	2	6.7
	3 people	5	14.3	10	33.3
	4 people or more	28	80.0	18	60.0
Family income (in minimum wages)					
	Up to 1 MW	10	28.6	5	16.7
	1 to 3 MW	16	45.7	14	46.7
	More than 3 MW	9	25.7	11	36.7
Education level (guardian)					
	Elementary school	10	28.6	5	16.7
	High school	15	42.9	17	56.7
	Higher education	10	28.6	8	26.7

NPS = negative parenting styles; PPS = positive parenting styles; MW = minimum wage.

Source: Authors

Table 2 presents the results of the independent samples t -test. The analyses revealed statistically significant differences between the NPS and PPS groups in sustained attention, short-term memory, and learning. The mean scores for sustained attention were: NPS: $M = 53.5$, $SD = 25$, and PPS: $M = 65.9$, $SD = 23.6$. The results indicated a significant difference in mean

scores between the groups ($t(63) = -2.046, p < .05$). The effect size was $d = 0.511$, indicating a medium effect size. For short-term memory, the mean scores were NPS: $M = 43.4, SD = 33.3$, and PPS: $M = 59.9, SD = 26.9$. The statistical difference was $t(63) = -2.215, p < .05$, with a medium effect size ($d = 0.545$). For learning, the mean scores were: NPS: $M = 47.8, SD = 27.7$, and PPS: $M = 60.4, SD = 20.9$. The statistical difference between groups was $t(63) = -2.039, p < .05$, with a medium effect size ($d = 0.513$).

Table 2 – Comparison of cognitive performance between NPS and PPS groups (independent samples t -test).

	Group	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i> -value	<i>M</i> Dif.	95% CI - Dif.		Cohen's <i>d</i>
								Lower	Upper	
IQ total										
	NPS	45.5	29.8	-.690	63	.493	-5.286	-20.597	10.025	.171
	PPS	50.8	31.9							
Divided attention										
	NPS	59.4	27.9	-1.020	63	.312	-6.629	-19.614	6.357	.254
	PPS	66.0	23.8							
Alternating attention										
	NPS	61.9	27.8	-.253	63	.801	-1.657	-14.732	11.418	.064
	PPS	63.6	24.5							
Sustained attention										
	NPS	53.5	25.0	-2.046	63	<.05*	-12.410	-24.529	-.290	.511
	PPS	65.9	23.6							
Short-term memory										
	NPS	43.4	33.3	-2.215	63	<.05*	-16.529	-31.443	-1.614	.545
	PPS	59.9	26.9							
Long-term memory										
	NPS	51.5	30.0	-1.238	63	.220	-8.586	-22.448	5.276	.311

	PPS	60.1	25. 2							
Learning										
	NPS	47.8	27. 7	-2.039	63	<.05*	-12.571	-24.891	-.252	.513
	PPS	60.4	20. 9							

NPS = negative parenting styles; PPS = positive parenting styles; CI = confidence interval; *df* = degree of freedom.

Source: Authors

Table 3 presents the Pearson correlation analysis for the NPS group ($n = 35$), examining relationships between sociodemographic, cognitive, and behavioral characteristics. The results showed significant associations between several variables. A moderate correlation was identified between guardians' education level and family income ($r = .411, p < .05$), suggesting a positive relationship between these factors. Additionally, guardians' education level was moderately associated with alternating attention ($r = .508, p < .01$) and sustained attention ($r = .482, p < .01$), indicating that higher education levels may be related to improved cognitive skills in adolescents.

Total IQ (IQ-T) was also moderately correlated with alternating attention ($r = .422, p < .05$) and sustained attention ($r = .460, p < .05$), suggesting a positive association between general intelligence and these cognitive abilities. Furthermore, sustained attention showed strong correlations with divided attention ($r = .554, p < .01$) and alternating attention ($r = .689, p < .01$), indicating a significant interrelationship between these cognitive skills.

Long-term memory presented strong correlations with divided attention ($r = .457, p < .05$) and short-term memory ($r = .747, p < .01$). In contrast, short-term memory showed a moderate correlation with divided attention ($r = .456, p < .05$). These findings suggest complex interrelationships between sociodemographic, cognitive, and behavioral characteristics in families with NPS.

Table 3 – Pearson correlation analysis for the NPS group ($n = 35$).

NPS	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Age										
2. Guardian's education	.038									
3. Family income	-.050	.411*								
4. IQ total	.034	.081	.137							
5. Divided attention	.195	.276	-.046	.273						
6. Alternating attention	.195	.508**	.076	.422*	.595**					
7. Sustained attention	.246	.482**	-.056	.460**	.554**	.689**				
8. Short-term memory	.025	.162	.067	.224	.456**	.161	.059			
9. Long-term memory	.231	.338*	.037	.191	.457**	.286	.241	.747**		
10. Learning	.157	.173	-.030	.111	.136	.280	.030	.469**	.613**	

NPS = negative parenting styles; IQ = intelligence quotient.

* $< .05$, ** $< .01$

Source: Authors.

Table 4 presents the Pearson correlation analysis for the PPS group ($n = 30$), examining relationships between sociodemographic and cognitive characteristics. The results revealed significant associations among various variables.

A moderate correlation was observed between age and sustained attention ($r = .381$, $p < .05$), suggesting a possible positive relationship. Moderate correlations were additionally found between guardians' education level and family income ($r = .467$, $p < .05$), as well as between total IQ (IQ-T) and family income ($r = .493$, $p < .05$), indicating positive associations between these sociodemographic factors.

IQ-T also had moderate correlations with alternating attention ($r = .431$, $p < .05$), divided attention ($r = .601$, $p < .01$), and learning ($r = .522$, $p < .01$), suggesting a link between intelligence and these cognitive skills.

Table 4 – Pearson correlation of sociodemographic and cognitive characteristics of the PPS group ($n = 30$).

PPS	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Age										
2. Guardian's education	-.075									
3. Family income	.015	.467*								
4. IQ total	.007	.493*	.359							
5. Divided attention	.359	.026	.211	.601**						
6. Alternating attention	.206	.431*	.498*	.390*	.357					
7. Sustained attention	.381*	.124	.422*	.278	.567***	.758**				
8. Short-term memory	-.046	-.126	.014	.313	.484**	-.005	.024			
9. Long-term memory	.011	.206	.110	.383*	.397*	.056	-.006	.587**		
10. Learning	.050	.194	.163	.522**	.492**	.160	.099	.653**	.808**	

PPS = positive parenting styles; IQ = intelligence quotient.

* $< .05$, ** $< .01$, *** $< .000$

Source: Authors.

Additionally, strong correlations were observed between divided attention and sustained attention ($r = .567$, $p < .01$), short-term memory ($r = .484$, $p < .01$), long-term memory ($r = .397$, $p < .05$), and learning ($r = .492$, $p < .01$), suggesting significant relationships among attention-related skills. Alternating attention also showed a strong correlation with sustained attention ($r = .758$, $p < .01$), emphasizing the interconnectedness of these abilities.

Short-term memory, furthermore, showed moderate correlations with long-term memory ($r = .587$, $p < .01$) and learning ($r = .653$, $p < .01$), while learning was strongly correlated with long-term memory ($r = .808$, $p < .01$). These results highlight the complexity of interactions between sociodemographic and cognitive characteristics in families with PPS.

4 Discussion

This study's results suggest that parenting styles are significantly associated with cognitive abilities and academic performance in adolescents. The findings are in line with the existing literature (e.g., Gasparotto *et al.*, 2018; Maldonado *et al.*, 2019; Moutinho *et al.*, 2019; Pinquart, 2016), which highlights the influence of parenting styles on various aspects of child and adolescent development.

Participants from the NPS group showed lower performance in sustained attention, short-term memory, and learning compared to the PPS group. These results support previous studies indicating that authoritarian and neglectful parenting styles may be associated with poorer academic and cognitive development (Odongo *et al.*, 2016; Park *et al.*, 2016). In contrast, supportive and communicative parenting styles, characteristic of positive parenting, have been consistently linked to better cognitive and emotional outcomes (Lanjekar *et al.*, 2022).

In addition to these studies, a broad body of literature supports these findings. For instance, Darling and Steinberg (1993) argue that authoritarian parenting styles, characterized by high demand and low responsiveness, are associated with negative academic performance and emotional development in children. Baumrind (1991) also emphasizes that permissive or neglectful parenting styles may result in lower self-regulation and poorer academic outcomes.

Conversely, studies by Grolnick and Ryan (1989) and Grolnick *et al.* (2000) indicate that an authoritative parenting style, which combines high expectations with strong responsiveness, promotes better academic and emotional outcomes. These findings align with our results, which show that the PPS group, characterized by positive parenting practices, performed better in various cognitive skills.

However, some studies report divergent results. For instance, Kuppens and Ceulemans (2019) argue that the relationship between parenting styles and academic outcomes may be influenced by contextual variables, such as cultural background and school environment. In cultures where authoritarian parenting is more common and socially accepted, the negative effects of this style may be less evidenced. This suggests that sociocultural and economic contexts may moderate the influence of parenting styles on adolescent cognitive and academic development.

The correlation analysis also revealed significant associations between sociodemographic characteristics (e.g., guardians' education level and family income) and cognitive abilities (e.g., sustained attention and short-term memory). These findings suggest that environmental and socioeconomic factors considerably impact adolescent cognitive development. Previous studies confirm that parental educational support and financial stability are strongly linked to academic performance and cognitive skill development (Hassan *et al.*, 2022). For example, Bradley and Corwyn (2002) emphasize that material resources and educational opportunities provided by parents are critical for cognitive development.

Additionally, correlations found between different attention skills (sustained, alternating, and divided attention) and short- and long-term memory suggest the interdependence of these cognitive abilities. The strong relationship between sustained attention and other attention and memory skills indicates that interventions aimed at improving one cognitive ability may have beneficial effects on others (Odongo *et al.*, 2016). These findings are consistent with theoretical models that propose interconnected cognitive processes, where improvements in one area can lead to enhancements in others (Miyake *et al.*, 2000).

On the other hand, some studies offer alternative perspectives on the interdependence of cognitive skills. For instance, Shipstead, Redick, and Engle (2012) argue that working memory capacity may be distinct from other cognitive abilities and that training working memory may not necessarily improve other cognitive functions. However, most research supports the notion that cognitive skills are highly interconnected, as observed in this study.

These results reinforce the importance of a family environment that promotes positive parenting practices, as this can facilitate higher cognitive and academic development. Furthermore, the findings emphasize the need to consider contextual factors, such as sociodemographic and environmental characteristics, when analyzing the influence of parenting styles on adolescent development.

In a study on learning and memory, Eichenbaum (2012) addressed memory consolidation processes, highlighting the importance of consolidation for information retention and retrieval. In our study, adolescents in the NPS group showed difficulties in short-term memory and learning, which may be related to problems in memory consolidation. According to Eichenbaum (2012), factors such as sleep, repetition, and emotional contexts can negatively impact memory consolidation, which could explain the cognitive difficulties observed in the NPS group. Although these factors were not directly explored in our study, they could be

relevant areas for future research, particularly in interventions aimed at improving memory consolidation and academic performance.

In another study investigating attention in adolescents with poor academic performance, Santos and Oliveira (2019) found that attention significantly impacts school performance. This finding supports our study regarding attentional deficits observed in the NPS group, particularly in sustained attention, and its relationship with lower academic achievement. The interventions suggested in their study, such as attention training programs, could be applied to adolescents in the NPS group to enhance their attention skills and academic performance. Additionally, investigating contextual factors, such as school environment and family support, could provide a deeper understanding of the causes of attentional deficits observed.

In a conceptual analysis and review of working memory and attention, Oberauer and Hein (2012) emphasized the interdependence of working memory and attention, which is essential for complex cognitive tasks. Our findings, which show significant correlations between different types of attention and memory, are consistent with their conclusions. Oberauer and Hein (2012) highlight that working memory is crucial for academic performance and that enhancing one cognitive skill can have positive effects on others. The interventions suggested in their study, which aim to strengthen working memory and attention, could be beneficial for adolescents, particularly those in the NPS group.

4.1 Conclusion

This study provides empirical evidence that parenting styles significantly influence learning, attention, and memory in adolescents. The results indicate that negative parenting styles (NPS) are associated with lower performance in sustained attention, short-term memory, and learning, while positive parenting styles (PPS) are linked to better cognitive performance.

The findings highlight the importance of parental responsiveness and structure in the development of cognitive and academic abilities in adolescents. Supportive and structured parenting practices provide a stimulating environment for intellectual growth, whereas authoritarian and permissive styles may hinder cognitive development.

Additionally, correlation analyses highlight significant associations between sociodemographic factors (e.g., guardians' education level and family income) and cognitive abilities, suggesting that socioeconomic conditions also play a crucial role in adolescent

cognitive performance. These results are in line with previous studies demonstrating that a stable family environment, educational opportunities, and positive reinforcement contribute to better cognitive outcomes.

Future studies should further explore moderating variables, such as school environment, peer relationships, and cultural influences, to better understand the mechanisms underlying the relationship between parenting styles and cognitive performance. Moreover, intervention programs focusing on parental education and adolescent cognitive training may be effective in mitigating the negative impacts of dysfunctional parenting styles.

In conclusion, our study underscores the importance of parental influence in shaping cognitive abilities and highlights the need for effective educational and psychological interventions to support adolescent development.

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