



Manufacturing Science and Education 2025

ACTA TECHNICA NAPOCENSIS

Series: Applied Mathematics, Mechanics, and Engineering

Vol. 68, Issue Special III, August, 2025

A DATA-DRIVEN APPROACH TO UNDERSTANDING DIGITAL PARENTING AND YOUTH MEDIA BEHAVIOUR

Daniel MARA, Raluca SASSU, Dana RAD

Abstract: As digital media continues to shape daily life, parents are facing new challenges in managing their children's screen time and media habits. This study examines how parental perceptions, media regulation strategies, and children's digital consumption patterns interact, using a decision tree regression approach. Drawing on data from 379 parents, the analysis identifies key factors influencing children's media use, with parents' perceptions of their child's media consumption, the perceived importance of media, and time regulation rules emerging as the most significant predictors. The findings reveal a complex relationship between parental attitudes, control strategies, and children's engagement with digital media, highlighting the need for personalized media literacy approaches. By providing a deeper understanding of digital parenting dynamics, this study offers valuable insights for educators and policymakers seeking to support informed and balanced parental decision-making in an increasingly digital world.

Keywords: media consumption, parental control, decision tree analysis, digital literacy, youth media engagement

1. INTRODUCTION

The rise of digital media has transformed everyday life, profoundly shaping how children engage with technology and how parents navigate their children's media consumption. As digital tools become increasingly embedded in both educational and recreational settings, parental regulation of children's screen time has emerged as a critical area of concern [1], [2]. The concept of digital parenting, broadly defined as the strategies and approaches parents employ to mediate their children's media use, encompasses a range of regulatory practices, from restrictive control to active mediation [3], [4].

Recent literature highlights the complexity of digital parenting, emphasizing how parental attitudes, digital literacy, and self-efficacy influence regulatory strategies [5], [6]. Research suggests that parental media control styles vary widely, with some parents adopting highly structured approaches—such as time restrictions and software monitoring—while others rely on open discussions and mutual agreements [7]. These differences are often shaped by

socioeconomic status, education level, and cultural contexts, which affect parental perceptions of media risks and benefits [8], [9]. Furthermore, children's autonomy in digital spaces is an emerging factor that complicates parental mediation strategies, as increased digital engagement often leads to resistance against strict parental controls [10].

Despite the growing body of research on digital parenting, few studies have systematically examined how specific parental perceptions and control mechanisms predict children's actual media consumption behaviors. In response to this gap, the present study employs a decision tree regression approach to identify key predictors of children's digital media use. By analyzing data from 379 parents, we aim to determine which parental factors most significantly influence children's media habits. Specifically, we investigate how parental perceptions of their child's media consumption, the perceived importance of various media forms, and specific control strategies such as time regulations impact children's engagement with digital media. This study seeks to address

the following research question: What are the key parental factors that predict children's media consumption patterns, and how do different parental control strategies shape children's engagement with digital media?

2. METHODS

2.1 Participants

This study included a total of 379 parents, with a final valid sample of 365 respondents after accounting for missing data. Participants ranged in age from 19 to 70 years ($M = 41.16$, $SD = 6.71$). The sample was predominantly female (87.9%), with 11.6% male participants and 0.5% who did not disclose their gender. Most participants resided in urban areas (86.3%), with smaller representations from rural (8.4%) and suburban (3.7%) settings. In terms of educational background, 33.1% held a bachelor's degree, 19.6% had a master's degree, and 1.5% had a doctorate. The majority of respondents (59.6%) had two children, while 24.5% had one child, and smaller proportions had three or more children, as seen in Table 1.

	Short-cycle tertiary education	7	1.8	2.1	37.7
	Bachelor's Degree	110	29	33.1	70.8
	Master's Degree	65	17	19.6	90.4
	Doctorate	5	1.3	1.5	91.9
	Other	27	7.1	8.1	100
	Total	332	88	100	
	Missing Data	47	12	-	-
	Total Sample	379	100	-	-
Number of Children	1	93	25	24.6	24.6
	2	226	60	59.8	84.4
	3	47	12	12.4	96.8
	4	7	1.8	1.9	98.7
	5	2	0.5	0.5	99.2
	More than 5	3	0.8	0.8	100
	Total	378	100	100	
	Missing Data	1	0.3	-	-
	Total Sample	379	100	-	-

The study included a total of 379 participants. However, due to missing data, the final valid sample for analysis consisted of 365 respondents. Participants ranged in age from 19 to 70 years ($M = 41.16$, $SD = 6.71$).

2.2 Instruments

The study utilized a structured survey composed of validated scales and single-item measures to assess various dimensions of parental perceptions, media use, and regulatory strategies. The script-based media importance in family scale ($\alpha = 0.874$) assessed the significance of digital media within family life, with specific emphasis on voice and audio media ($\alpha = 0.910$) and picture and video media ($\alpha = 0.915$). Participants rated the importance of these media types on a 1-to-10 scale. Additional scales measured daily media consumption at work ($\alpha = 0.720$) and during leisure time at home ($\alpha = 0.770$), capturing the frequency and types of media used in different contexts.

Parental perceptions of media use were assessed using single-item measures, including perception about own media consumption at work and at home (1-to-5 scale), as well as

Table 1

Participants characteristics					
Category	Response	Frequency	%	Valid %	Cumulative Percent
Residence	Urban	327	86	87.7	87.7
	Rural	32	8.4	8.6	96.2
	Suburban	14	3.7	3.8	100
	Total	373	98	100	
	Missing Data	6	1.6	-	-
	Total Sample	379	100	-	-
Gender	Male	44	12	11.6	11.6
	Female	333	88	87.9	99.5
	Not Disclosing	2	0.5	0.5	100
	Total	379	100	100	
	Missing Data	1	0.3	-	-
Educational Level	Primary	10	2.6	3	3
	Secondary education	40	11	12	15.1
	Post-secondary non-tertiary education	68	18	20.5	35.5

feelings about media consumption in these environments. Child media consumption was measured through a nine-item scale ($\alpha = 0.749$), which included questions about electronic audio devices, digital content, and interactive platforms. Parental attitudes toward their child's media use were assessed through single-item measures on perceived media autonomy, reluctant media consumption, and perceptions of child media consumption (1-to-5 scales).

Parental control strategies were also measured through various single-item indicators. Participants reported whether they set time limits on media use, utilized software control mechanisms, engaged in mutual agreements regarding media use, or promoted media-free family activities. Responses were captured on a 1-to-5 scale. Additionally, binary yes/no questions were used to assess parental encouragement of social media in school, parental media usage limits, and online social network engagement.

2.3 Procedure

Data collection was conducted via an online survey, which was distributed to parents through social media groups and parenting forums. The survey was anonymous, and participants provided informed consent before proceeding. The study utilized a decision tree regression approach, with child daily media consumption as the dependent variable and parental perceptions, control strategies, and household media usage patterns as independent variables. Statistical analyses were conducted using JASP, an open-source statistical software, to identify key predictors of child media consumption. The decision tree model allowed for an exploratory assessment of hierarchical interactions among variables, providing insight into the most influential parental factors shaping children's media use.

3. RESULTS AND DISCUSSION

3.1. Results

The results presented in Table 2 indicate variability in parental perceptions, control strategies, and child media consumption habits. On average, parents rated script-based media

importance in family at 7.262 (SD = 2.329), with voice and audio media importance at 6.914 (SD = 2.608) and picture and video media importance at 6.900 (SD = 2.622). Daily media consumption at work (M = 2.016, SD = 0.921) and at home for leisure (M = 2.018, SD = 0.796) showed similar patterns.

Table 2

Scales and single items descriptive statistics

	Valid	Missing	Mean	Std. Dev.	Min.	Max.
Script base media importance in family	379	0	7.262	2.3	0	10
Voice and audio media importance in family	379	0	6.914	2.6	0	10
Picture and video media importance in family	379	0	6.9	2.6	0	10
Analog home media use	375	4	2.76	1.2	1	5
Digital home media use	370	9	3.454	1	1	5
Daily media consumption at work	379	0	2.016	0.9	0	6
Daily media consumption at home leisure time	379	0	2.018	0.8	0	5
Perception about own media consumption at work	370	9	2.462	1.2	1	5
Perception about own media consumption at home	371	8	2.806	1	1	5
Feeling about own media consumption at work	374	5	2.706	0.9	1	5
Feeling about own media consumption at home	371	8	2.542	0.9	1	5
Child daily media consumption	379	0	2.074	0.8	0	5.33
Perception about child media consumption	368	11	3.473	0.9	1	5
Feeling about child media consumption	370	9	2.978	1	1	5
Perceived media autonomy	363	16	3.292	0.8	1	4
Reluctant media consumption	360	19	3.1	0.9	1	4
Online social network engagement	369	10	1.111	0.3	1	2

Post social network experience	325	54	3.757	0.8	1	5
Parental encouragement of social media in school	367	12	1.349	0.5	1	2
Parental media usage limits	360	19	1.233	0.4	1	2
Parental media control type	362	17	2.55	1.1	1	4
Software control	214	165	2.692	1.1	1	5
Time limits rule	238	141	2.966	1.1	1	5
Mutual agreements	231	148	2.861	1.2	1	5
Media free family activity	229	150	3.489	1.2	1	5

Parental perceptions of their own media consumption varied, with an average score of 2.462 (SD = 1.214) for work and 2.806 (SD = 1.021) for home use. Parents' feelings about their own media consumption were slightly lower, averaging 2.706 (SD = 0.860) for work and 2.542 (SD = 0.927) for home.

Children's daily media consumption was reported at an average of 2.074 (SD = 0.808). Parents perceived their child's media consumption as moderate (M = 3.473, SD = 0.876), while their feelings about it were slightly lower (M = 2.978, SD = 0.990).

Parental control strategies revealed relatively low levels of software control (M = 2.692, SD = 1.142), time limits rules (M = 2.966, SD = 1.079), and mutual agreements (M = 2.861, SD = 1.156), while media-free family activities were rated slightly higher (M = 3.489, SD = 1.213). Parental encouragement of social media use in school remained limited (M = 1.349, SD = 0.477), and parental media usage limits were reported at a mean of 1.233 (SD = 0.424).

The decision tree regression model was developed using a training set of 100 observations and a test set of 25 observations. The model produced 73 splits, indicating a relatively complex tree structure aimed at capturing the relationships between parental factors and child media consumption. The mean squared error (MSE) for the test set was 0.638, suggesting a moderate level of predictive accuracy. This result indicates that while the decision tree was able to identify important predictors, there may still be room for

refinement or alternative modeling approaches to improve predictive performance.

The evaluation metrics of the decision tree regression model indicate its predictive performance. The mean squared error (MSE) was 0.638, which aligns with the test set MSE, confirming the model's consistency. The root mean squared error (RMSE) was 0.799, representing the average magnitude of prediction errors, suggesting a moderate degree of error in the model's estimates. The mean absolute error (MAE/MAD) was 0.666, reflecting the average absolute difference between predicted and actual values, as seen in Table 3.

Table 3

Evaluation Metrics	
	Value
MSE	0.638
RMSE	0.799
MAE / MAD	0.666
MAPE	406.26%
R ²	0.339

The mean absolute percentage error (MAPE) was 406.26%, indicating a high relative error, which suggests that while the model captures patterns, its predictions vary significantly in relation to actual values. Finally, the coefficient of determination (R²) was 0.339, meaning that approximately 33.9% of the variance in child media consumption could be explained by the independent variables.

The feature importance analysis highlights the most influential predictors of child media consumption as determined by the decision tree regression model, depicted in Table 4.

Table 4

Feature Importance	
	Relative Importance
Perception about child media consumption	28.337
Picture and video media importance in family	12.64
Script base media importance in family	10.506
Voice and audio media importance in family	9.82
Time limits rule	9.161
Child daily media consumption	7.657
Feeling about own media consumption at work	6.471

Daily media consumption at home leisure time	2.535
Daily media consumption at work	2.254
Mutual agreements	2.237
Parental media control type	1.842
Feeling about own media consumption at home	1.618
Reluctant media consumption	1.618
Analog home media use	0.711
Software control	0.684
Age	0.663
Digital home media use	0.491
Perception about own media consumption at home	0.491
Media free family activity	0.264

Perception about child media consumption emerged as the strongest predictor, with a relative importance score of 28.337, indicating that how parents perceive their child's media use significantly impacts actual consumption patterns.

The next most important factors were picture and video media importance in the family (12.640), script-based media importance in family (10.506), and voice and audio media importance in family (9.820), suggesting that different forms of media engagement within the household play a crucial role in shaping children's digital behaviors. Time limits rule (9.161) also showed notable importance, indicating that parental restrictions on screen time contribute to differences in media consumption.

Other moderately important predictors included child daily media consumption (7.657) and feeling about own media consumption at work (6.471), which suggest a potential link between parents' own digital habits and their children's engagement with media. In contrast, variables such as mutual agreements (2.237) and parental media control type (1.842) had lower relative importance, suggesting that while parental regulation strategies matter, they may not be as decisive as perceptions and media exposure at home. Lower-ranked features, including analog home media use (0.711), software control (0.684), and media-free family activity (0.264), suggest that explicit parental restrictions and structured media-free time play

a lesser role in predicting child media consumption compared to parental perceptions and overall household media exposure. These findings underscore the complexity of digital parenting and suggest that a combination of parental attitudes, household media culture, and specific regulatory strategies contribute to children's media behaviors. The predictive performance plot (Figure 1) provides a visual representation of the model's accuracy in estimating child media consumption based on parental factors. This plot illustrates the alignment between observed and predicted values, highlighting the model's ability to capture underlying patterns while also indicating the presence of some variance that remains unexplained.

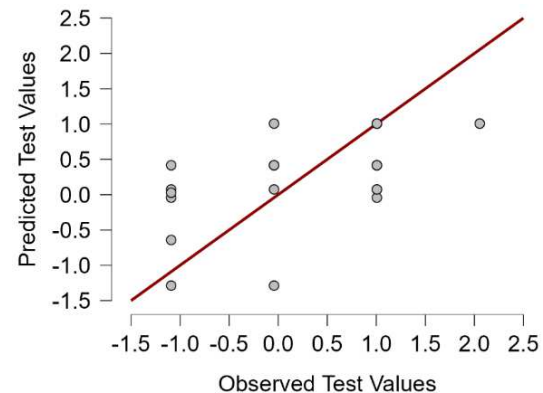


Fig. 1. Predictive Performance Plot

The decision tree plot (Figure 2) offers insight into the hierarchical structure of the predictive model. This tree visually maps out the most influential factors driving children's media consumption, with perception about child media consumption as the primary splitting criterion. Subsequent branches reveal the role of media importance within the family, time regulation rules, and parental control strategies, demonstrating how these variables interact in predicting media engagement. The structure of the decision tree underscores the complexity of digital parenting, illustrating the key decision points that shape children's digital behaviors.

The decision tree plot in Figure 2 illustrates the hierarchical relationships among parental perceptions, media regulations, and child media consumption behaviors. At the top of the tree, the most significant predictor is perception about

child media consumption. This suggests that how parents perceive their child's media habits strongly influences actual usage patterns. The

first split occurs at a threshold of -0.0621, dividing the data into two major branches.

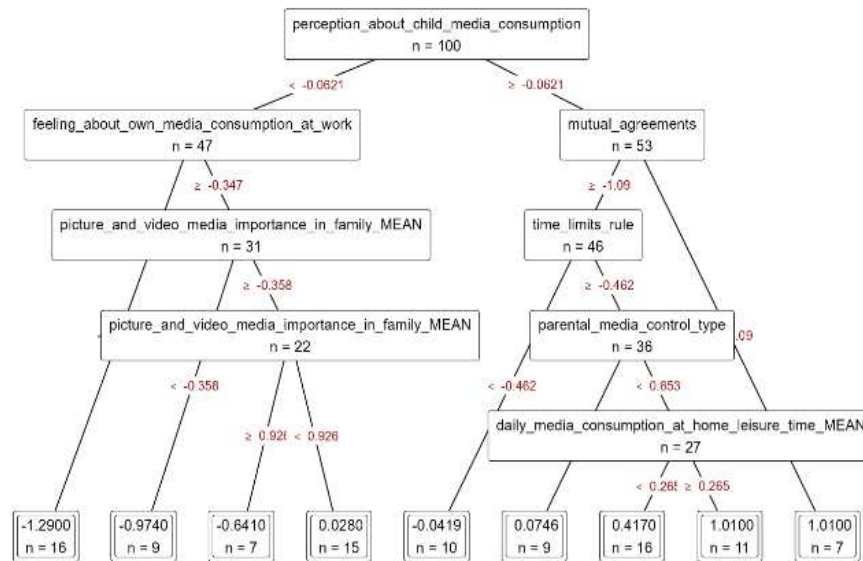


Fig. 2. Decision Tree Plot

On the left branch, cases where parents have a more negative perception of their child's media consumption (values below -0.0621) are further influenced by their own feelings about media consumption at work. Parents who feel negatively about their own digital habits (values below -0.347) tend to have children whose media consumption is shaped by the importance of picture and video media in family life. This factor is examined in two consecutive decision points, with a split at -0.358, showing that families where visual media plays a lesser role tend to have lower child media consumption. The final subcategories indicate that when picture and video media are not a central part of family life, children's digital engagement is significantly lower, with predicted values of -1.2900, -0.9740, and -0.6410.

Conversely, when picture and video media are more integrated into family life (values greater than -0.358), additional factors such as the extent of digital engagement within the family come into play. The model further refines its predictions based on specific thresholds ($0.92 < 0.926$), illustrating that even slight variations in media importance can result in different media consumption levels. On the right branch, where parental perception of child media

consumption is more neutral or positive (≥ -0.0621), the next key factor is mutual agreements between parents and children regarding media use. If mutual agreements are relatively low (≥ -1.09), media use is further shaped by time limits set by parents. This branch splits at -0.462, suggesting that in families where structured screen time regulations exist, additional factors like parental media control type become relevant.

For children in families with more structured parental control approaches, daily media consumption at home for leisure time becomes a distinguishing factor. This variable is split at 0.265, showing that children whose parents enforce control but allow moderate screen time tend to have lower media consumption (0.0746, 0.4170). However, children in households with relaxed controls and high leisure screen time (≥ 0.265) show significantly higher media use (1.0100).

Overall, the decision tree structure highlights that parental perception, regulation strategies, and the household media environment interact in complex ways to influence child media engagement. While parental attitudes toward digital habits play a primary role, other moderating factors—such as parental feelings

about their own media use, family agreements on screen time, and the presence of rules—further refine the prediction of media consumption behaviors.

3.2. Discussion

The findings of this study contribute to the growing body of literature on digital parenting and youth media consumption by highlighting the intricate relationships between parental perceptions, media regulation strategies, and children's engagement with digital media. Previous research has consistently emphasized the role of family dynamics in shaping media consumption habits [11], [12]. Our results align with these findings, particularly in demonstrating that parents' perceptions of their child's media use play a more substantial role than direct media control measures. This supports previous research indicating that open discussions and negotiated media rules lead to more balanced and responsible media usage in adolescents [13]. Another critical finding relates to the importance of media type in family settings. The results indicate that the role of picture and video media in family life significantly predicts children's digital media engagement. This aligns with past studies emphasizing the ecological perspective of media consumption, where different media formats interact with family routines to shape children's habits [14], [15]. The decision tree analysis also suggests that parental feelings about their own media consumption at work influence child media use, further supporting the idea that parents' behaviors and attitudes serve as a model for children's media habits [16], [17]. Interestingly, while strict parental control measures such as software monitoring and setting time limits had some influence on media consumption, they were not the strongest predictors. This suggests that children may find ways to bypass restrictions or that other contextual factors—such as the availability of media at home—play a more dominant role in shaping consumption behaviors.

4. CONCLUSION

This study highlights the complex interplay between parental perceptions, regulatory strategies, and children's digital media consumption patterns. The results indicate that parental perception of child media use is the most critical factor, while mutual agreements and the importance of media in family life also play significant roles. While parental controls like time limits and software restrictions contribute to shaping media behaviors, open discussions and family media norms appear to have a more profound and lasting impact.

These findings offer important implications for educators, policymakers, and parents seeking to promote balanced media consumption among children. Rather than relying solely on restrictions, digital parenting strategies should focus on fostering open communication and setting negotiated guidelines. Future research should further explore the role of family media culture and longitudinal effects of parental media behaviors on child development.

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O abordare bazată pe date pentru înțelegerea parentingului digital și a comportamentului media al tinerilor

Pe măsură ce media digitală continuă să modeleze viața de zi cu zi, părinții se confruntă cu noi provocări în gestionarea timpului petrecut în fața ecranului și a obiceiurilor media ale copiilor lor. Acest studiu examinează modul în care interacționează percepțiile părinților, strategiile de utilizare a mass-media și modelele de consum digital ale copiilor, utilizând o abordare de regresie a arborelui decizional. Bazându-se pe datele obținute de la 379 de părinți, analiza identifică factorii cheie care influențează utilizarea media de către copii, percepțiile părinților cu privire la consumul media al copiilor lor, importanța acestora și regulile de utilizare eficientă a timpului, fiind cei mai importanți predictorii. Constatările relevă o relație complexă între atitudinile părinților, strategiile de control și implicarea copiilor în mass-media digitale, subliniind necesitatea unor abordări personalizate ale alfabetizării media. Prin furnizarea unei înțelegeri mai profunde a dinamicii parentale digitale, acest studiu oferă perspective valoroase pentru profesori și factori de decizie care doresc să sprijine luarea deciziilor informate ale părinților într-o lume din ce în ce mai digitală.

Daniel MARA, Faculty of Social Sciences and Humanities, "Lucian Blaga" University of Sibiu, 550024 Sibiu, Romania, daniel.mara@ulbsibiu.ro

Raluca SASSU, Faculty of Social Sciences and Humanities, "Lucian Blaga" University of Sibiu, 550024 Sibiu, Romania, raluca.sassu@ulbsibiu.ro

Dana RAD, Center of Research Development and Innovation in Psychology, Faculty of Educational Sciences Psychology and Social Sciences, Aurel Vlaicu University of Arad, 310032 Arad, Romania, dana@xhouse.ro