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Parenting Styles, Technology Exposure, and Behavioral Outcomes in Early Adolescents

Mgbebu, Ikechukwu Ogbu
Department of Philosophy & Religion
Ebonyi State University, Nigeria
Email: ikechukwumgbebu@gmail.com Phone: +234 (0)8063374444
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Abstract
The study investigated the relationship among parenting styles, technology exposure, and behavioral outcomes in early adolescents across Lagos, Abuja, and Port Harcourt. Using a cross-sectional quantitative design, data were collected from 450 adolescents aged 10–14 years through structured questionnaires measuring parenting styles, screen time, parental mediation, and behavioral adjustment. Descriptive analyses showed that respondents averaged 4.6 hours of daily screen time, with authoritative parenting being the most prevalent style. Correlation results indicated that screen time negatively associated with behavioral outcomes, while authoritative parenting demonstrated strong positive relationships with academic engagement, social competence, and attention regulation. Regression analysis revealed that authoritative parenting (β = .41) significantly predicted positive behavioral outcomes, whereas authoritarian (β = –.14) and permissive/neglectful parenting (β = –.21) predicted poorer adjustment. Screen time emerged as a strong negative predictor (β = –.38), but parental mediation partly reduced its detrimental effects. Cross-city comparisons showed that Lagos adolescents had the highest screen exposure and lowest behavioral scores. Overall, findings emphasized the need for integrated family-based interventions promoting responsible technology use and positive parenting. The study contributed empirical insights into the interaction between digital engagement and parenting behaviors in shaping adolescent development.

Keywords: Parenting styles; Technology exposure; Behavioral outcomes; Adolescents; Parental mediation.

1. Introduction

Research on early adolescent development had increasingly emphasized the interplay between parenting styles and technology exposure as determinants of behavioral outcomes. Scholars had reported that parenting approaches—ranging from authoritative, authoritarian, permissive, to neglectful—shaped the cognitive, emotional, and social competencies of adolescents, influencing their self-regulation, academic engagement, and peer relationships (Baumrind, 1991; Steinberg et al., 2006). Concurrently, the rapid proliferation of digital technologies, including smartphones,

tablets, and social media platforms, had exposed adolescents to both opportunities for learning and risks of maladaptive behaviors, such as reduced attention span, social withdrawal, and aggression (Rideout, 2016; Livingstone & Smith, 2014). Studies had suggested that parenting style moderated the effects of technology exposure, with authoritative parenting buffering against negative outcomes and permissive or neglectful parenting amplifying vulnerabilities (Padilla-Walker & Coyne, 2011).

Empirical evidence had indicated that authoritative parenting, characterized by high warmth and moderate control, fostered resilience in adolescents navigating digital environments. Researchers had reported that adolescents with authoritative parents demonstrated better self-regulation, higher academic motivation, and reduced susceptibility to cyberbullying and online addiction (Steinberg, 2001). In contrast, authoritarian parenting, emphasizing strict control and low warmth, had been associated with heightened anxiety, rebellious behaviors, and secretive online activities, reflecting the tension between imposed restrictions and adolescents' autonomy needs (Baumrind, 1991; Valkenburg et al., 2011). Permissive parenting, marked by high warmth but low discipline, had often been linked to excessive screen time and poor self-regulation, while neglectful parenting had been correlated with both digital overexposure and behavioral problems, including aggression and social isolation (Padilla-Walker & Coyne, 2011). The study of technology exposure had revealed that adolescents spent an increasing proportion of their waking hours interacting with digital devices. Surveys across diverse urban settings had indicated that screen time ranged from 3 to 6 hours per day, including social media, gaming, and video streaming, with variations based on parental supervision and household socioeconomic status (Rideout, 2016). Scholars had emphasized that unregulated technology exposure could interfere with sleep, academic performance, and interpersonal skills, while guided exposure could enhance digital literacy, problem-solving skills, and social connectedness (Livingstone & Smith, 2014). In African contexts, emerging studies had highlighted challenges such as limited parental digital literacy, cultural attitudes toward technology, and uneven access to devices, which influenced adolescents' behavioral outcomes in nuanced ways (Adeyemi & Olowu, 2020). Two theoretical frameworks had frequently guided research in this area: Baumrind's Parenting Style Theory and Bronfenbrenner's Ecological Systems Theory.

Parenting Style Theory had provided a classification of parental approaches and their associated outcomes, offering a predictive framework for adolescent adjustment in both offline and online contexts (Baumrind, 1991). Ecological Systems Theory had been employed to contextualize adolescent behavior within broader environments, emphasizing the interaction between microsystems, such as family and school, and exosystems, including neighborhood and digital culture (Bronfenbrenner, 1979). Researchers had argued that these frameworks together facilitated understanding of how parenting practices and technology exposure intersected to influence behavioral outcomes. The central goal of this study was to investigate the relationship between parenting styles, technology exposure, and behavioral outcomes among early adolescents aged 10–14 years. The study aimed to quantify the influence of different parenting styles on adolescents' digital engagement, assess the prevalence and type of technology exposure, and determine how these factors jointly predicted behavioral outcomes, including social skills, aggression, academic engagement, and emotional regulation. By integrating Parenting Style Theory and Ecological Systems Theory, the study sought to explain both individual and contextual mechanisms that shape adolescent behavior in digitally mediated environments.

This research had been particularly motivated by concerns over the increasing prevalence of technology-mediated behavioral challenges among adolescents and the limited empirical studies addressing the moderating role of parenting styles in African contexts. The study intended to provide evidence-based insights for parents, educators, and policymakers to design interventions that balance digital access with behavioral development, emphasizing proactive parenting strategies that leverage technology for positive adolescent growth while mitigating risks associated with overexposure or unsupervised use.

2. Literature Review

Research examining adolescent behavioral outcomes had increasingly focused on the interaction between parenting styles and technology exposure. Scholars had reported that parenting practices significantly influenced adolescents' social, cognitive, and emotional development, with differential effects based on the type of parenting employed (Baumrind, 1991; Steinberg et al., 2006). Parenting Style Theory had

provided a framework for understanding these differences, categorizing parental approaches as authoritative, authoritarian, permissive, or neglectful. Empirical studies had demonstrated that authoritative parenting, which combined warmth with appropriate control, was consistently associated with positive behavioral outcomes, including higher academic engagement, better self-regulation, and lower levels of aggression (Steinberg, 2001; Padilla-Walker & Coyne, 2011).

In contrast, authoritarian parenting, characterized by high control and low warmth, had been linked to increased anxiety, oppositional behaviors, and secretive engagement with digital technologies. Scholars had suggested that adolescents under authoritarian regimes often sought autonomy online, engaging in unsupervised social media use and gaming, which sometimes led to maladaptive outcomes (Valkenburg et al., 2011; Ohme et al., 2020). Permissive parenting, marked by high warmth but minimal discipline, had been associated with excessive screen time and diminished self-regulation, whereas neglectful parenting had been correlated with both overexposure to technology and poor behavioral adjustment (Padilla-Walker & Coyne, 2011; Radesky et al., 2020).

Studies had highlighted that technology exposure had become an integral aspect of early adolescence, influencing behavior in both positive and negative directions. Rideout (2016) had reported that adolescents spent an average of 3–6 hours per day on digital devices, including social media, gaming, and educational platforms. Researchers had emphasized that unsupervised or excessive technology use was associated with reduced attention spans, poor academic performance, social withdrawal, and increased aggressive behaviors (Livingstone & Smith, 2014; Przybylski & Weinstein, 2019). Conversely, guided and purposeful technology engagement had been shown to enhance problem-solving skills, digital literacy, and peer connectedness, indicating that the behavioral impact of technology was contingent on both exposure and parental mediation (Nikken & Schols, 2015; Rideout, 2016). Parental mediation had emerged as a critical factor moderating the relationship between technology exposure and adolescent behavior. Scholars had identified three primary forms of mediation: restrictive mediation (setting limits on usage), active mediation (engaging in discussions about online content), and co-use (jointly engaging in digital activities) (Nikken & Schols, 2015). Studies had consistently

demonstrated that active mediation and co-use were associated with more positive behavioral outcomes, such as better emotional regulation, improved social skills, and responsible online conduct (Livingstone et al., 2017). Restrictive mediation, while sometimes effective in reducing screen time, had been found to provoke resistance, secrecy, and rebellious behaviors in adolescents, particularly in contexts of authoritarian parenting (Valkenburg et al., 2011).

Cross-cultural research had indicated that parenting styles and technology exposure patterns varied substantially across different sociocultural contexts. In Western societies, where adolescents had greater autonomous access to digital devices, authoritative parenting had been more effective in regulating behavioral outcomes, whereas authoritarian approaches often led to secretive online behaviors and increased risk-taking (Steinberg et al., 2006; Padilla-Walker & Coyne, 2011). In African contexts, emerging research had highlighted the influence of extended family involvement, communal norms, and limited parental digital literacy on adolescents' online behavior (Adeyemi & Olowu, 2020). Studies had reported that adolescents whose parents lacked digital knowledge were more likely to encounter behavioral challenges, including cyberbullying, social withdrawal, and diminished academic engagement (Adeyemi & Olowu, 2020).

Theoretical frameworks had offered explanatory mechanisms for these observed patterns. Parenting Style Theory had clarified the differential influence of parental warmth and control on adolescent self-regulation, emotional adjustment, and decision-making in the digital age (Baumrind, 1991). Scholars had reported that adolescents under authoritative parenting were more likely to internalize behavioral norms, regulate their own screen time, and use technology constructively, whereas those under permissive or neglectful parenting had relied on external structures, resulting in overexposure and maladaptive behaviors (Padilla-Walker & Coyne, 2011; Radesky et al., 2020). Bronfenbrenner's Ecological Systems Theory had further contextualized adolescent behavior within multilayered environments, emphasizing how microsystems (family and peers) interacted with mesosystems (school) and exosystems (digital culture, community norms) to shape outcomes (Bronfenbrenner, 1979). Researchers had argued that digital technologies formed a significant

component of adolescents' exosystem, influencing interactions within the family, peer relationships, and educational engagement (Livingstone et al., 2017).

Empirical studies had consistently shown that behavioral outcomes were not solely determined by parenting style or technology exposure but by the interaction of the two. Scholars had reported that high exposure to digital technologies under authoritative parenting was often associated with enhanced problem-solving, academic engagement, and social competence, whereas similar exposure under permissive or neglectful parenting led to higher instances of behavioral problems, including attention difficulties, aggression, and social withdrawal (Padilla-Walker & Coyne, 2011; Radesky et al., 2020). Studies had emphasized the moderating effect of parental mediation, with active engagement and co-use reducing the likelihood of negative outcomes and reinforcing prosocial behaviors (Nikken & Schols, 2015; Livingstone et al., 2017). Several studies had quantified these relationships using large-scale surveys and observational designs. Rideout (2016) had demonstrated that each additional hour of unsupervised screen time was associated with a 12% increase in reported attention problems and a 9% increase in social withdrawal among adolescents. In a study in urban Nigerian settings, Adeyemi and Olowu (2020) had found that adolescents exposed to more than 4 hours of unsupervised screen time per day were 1.7 times more likely to exhibit aggressive behaviors when parenting was permissive or neglectful. Similarly, Steinberg et al. (2006) had reported that adolescents with authoritative parents spent more time on educational and prosocial digital activities, while those with authoritarian or neglectful parents engaged in riskier online behaviors.

Research had also highlighted the cumulative impact of technology exposure and parenting on mental health outcomes. Excessive or unsupervised digital engagement had been associated with elevated levels of anxiety, depressive symptoms, and poor sleep patterns, particularly when parental guidance was absent (Twenge & Campbell, 2018). Conversely, parental involvement had been reported to buffer these risks, with active discussion, co-use, and modeling of responsible technology habits linked to improved emotional regulation, resilience, and academic performance (Nikken & Schols, 2015; Padilla-Walker & Coyne, 2011). In summary, the literature had demonstrated a clear and consistent interaction between parenting styles, technology

exposure, and behavioral outcomes in early adolescents. Authoritative parenting emerged as protective, promoting positive behavioral adaptation even with substantial technology use, whereas authoritarian, permissive, or neglectful parenting increased vulnerability to maladaptive outcomes. Technology exposure, when guided and moderated, could enhance learning, social engagement, and self-regulation, but unregulated use posed risks for aggression, attention deficits, social withdrawal, and emotional dysregulation. Bronfenbrenner's Ecological Systems Theory had contextualized these dynamics within broader environmental systems, emphasizing that digital culture, peer influence, and family interaction collectively shaped behavioral outcomes. Collectively, the literature underscored the necessity of examining both parenting practices and technology exposure in concert to understand and promote healthy adolescent development in contemporary digital contexts.

3. Methodology

The study had adopted a quantitative, cross-sectional survey design to examine the relationships among parenting styles, technology exposure, and behavioral outcomes in early adolescents. This approach had been selected to allow for the simultaneous measurement of multiple variables across a large sample, facilitating statistical analysis of predictive relationships and correlations (Creswell, 2014). The research had operationalized parenting styles using Baumrind's typology, categorizing respondents' parents as authoritative, authoritarian, permissive, or neglectful (Baumrind, 1991). Technology exposure had been measured by daily screen time, type of device usage (educational, gaming, social media), and level of parental mediation (restrictive, active, or co-use) (Nikken & Schols, 2015). Behavioral outcomes had been operationalized as a composite index comprising academic engagement, aggression, attention regulation, and social competence, with higher scores reflecting more positive adjustment. The population had consisted of early adolescents aged 10–14 years attending public and private schools in Lagos, Abuja, and Port Harcourt, Nigeria. Inclusion criteria required adolescents to have at least one primary caregiver providing daily supervision. Multi-stage sampling had been used: first, schools had been stratified by type (public/private) and location (urban/suburban); second, classrooms had been randomly selected; third, students

within those classrooms had been randomly invited to participate. A total of 450 adolescents were reported to have completed the survey, yielding a final sample size sufficient for statistical analyses and generalizability.

Data had been collected using a structured questionnaire comprising four sections: demographic information, parenting style inventory, technology exposure scale, and behavioral outcomes checklist. Parenting style inventory had included items assessing parental warmth, control, and responsiveness. Technology exposure scale had measured average daily screen time (in hours), type of device used, and frequency of parental mediation, while behavioral outcomes checklist had utilized teacher- and self-reports on academic engagement, attention regulation, social competence, and aggression. Reliability analysis during a pilot study with 50 participants had yielded Cronbach's alpha values ranging from 0.78 to 0.86 across all subscales, indicating strong internal consistency. Content validity had been established through expert review by developmental psychologists and educational researchers.

Descriptive statistics had been calculated to summarize demographic characteristics, parenting styles, levels of technology exposure, and behavioral outcomes. Pearson correlation analysis had been employed to assess associations among continuous variables, such as screen time and behavioral outcome indices. Multiple regression analysis had been used to examine the predictive power of parenting styles and technology exposure on behavioral outcomes, expressed as:

$$BO=\beta0+\beta1AP+\beta2AT+\beta3PT+\varepsilon$$

where

BO = Behavioral Outcome Index,

AP = Authoritative Parenting Score,

AT = Authoritarian Parenting Score,

PT = Permissive/Neglectful Parenting Score,

ε = error term.

Ethical approval had been obtained from the University of Lagos Research Ethics Committee. Participation had been voluntary, with informed consent obtained from parents or guardians, and assent from adolescents. Confidentiality had been maintained by anonymizing data and securely storing questionnaires. Data analyses had been conducted using SPSS Version 28, with significance levels set at $p < .05$.

This methodology provided a systematic framework for quantifying the effects of parenting styles and technology exposure on adolescent behavioral outcomes, enabling the study to generate empirical evidence for evidence-based interventions aimed at promoting healthy adolescent development in digitally mediated environments.

4. Results

This section presents the quantitative findings from 450 early adolescents sampled across Lagos, Abuja, and Port Harcourt. Analysis focused on descriptive statistics, correlation patterns among key variables, and regression models predicting behavioral outcomes from parenting styles and technology exposure.

Table 1

Descriptive Statistics of Key Variables (N = 450)

Variable	Mean (M)	(SD	Minimum	Maximum
Screen Time (Hours/Day)	4.62	1.83	1.0	10.0
Authoritative Parenting Score	32.44	6.51	15.0	45.0
Authoritarian Parenting Score	28.12	7.10	12.0	44.0
Permissive/Neglectful Parenting Score	25.76	5.66	10.0	40.0
Behavioral Outcome Index	68.35	12.42	30.0	95.0
Parental Mediation Score	18.72	4.39	6.0	28.0

Interpretation:

Respondents reported an average of 4.6 hours of screen time daily, indicating high digital exposure. Authoritative parenting had the highest mean score among parenting styles, suggesting it was the most common pattern in the sampled households.

Behavioral outcomes showed moderate variability, providing sufficient range for predictive analyses.

Table 2

Frequency Distribution of Parenting Styles

Parenting Style	Frequency (n)	Percentage (%)
Authoritative	182	40.4%
Authoritarian	126	28.0%
Permissive	89	19.8%
Neglectful	53	11.8%

Interpretation:

Authoritative parenting dominated the sample, while neglectful parenting was least prevalent. This pattern aligns with demographic characteristics of Nigerian urban households, where structured but warm parenting is increasingly practiced.

Table 3

Intercorrelation Matrix of Core Variables

Variables	1	2	3	4	5
1. Screen Time	1	—	—	—	—
2. Authoritative Parenting	–0.32**	1	—	—	—
3. Authoritarian Parenting	0.21**	–0.41**	1	—	—
4. Permissive/Neglectful Parenting	0.37**	–0.45**	0.29**	1	—
5. Behavioral Outcome Index	–0.48**	0.52**	–0.27**	–0.44**	1

Note: $p < .01$

Interpretation:

Screen time had a significant negative correlation with behavioral outcomes ($r = –.48$), indicating that higher digital exposure was associated with more problematic

adjustment. Authoritative parenting was positively associated with behavioral outcomes (r = .52), while authoritarian and permissive/neglectful styles showed negative correlations of varying strength. These patterns supported theoretical expectations that stable, supportive parenting correlates with healthier adolescent functioning.

Table 4

Multiple Regression Predicting Behavioral Outcomes from Parenting Styles and Technology Exposure

Predictor	Unstandardized Coefficient (B)	Std. Error	Beta (β)	t-value	Sig. (p)
Screen Time	–2.41	0.32	–0.38	–7.43	.001**
Authoritative Parenting	0.74	0.10	0.41	7.18	.001**
Authoritarian Parenting	–0.28	0.09	–0.14	–3.11	.002*
Permissive/Neglectful Parenting	–0.46	0.11	–0.21	–4.18	.001**
Parental Mediation	0.58	0.14	0.22	4.08	.001**
Constant	31.88	4.52	—	7.04	.001

Model Summary:

$R = .74$

$R^2 = .55$

Adjusted $R^2 = .54$

$F(5, 444) = 109.82$, $p < .001$

Interpretation:

The regression model explained 55% of the variance in behavioral outcomes. Screen time emerged as a strong negative predictor (β = –.38), while authoritative parenting had a strong positive impact (β = .41). Both authoritarian and permissive/neglectful parenting predicted poorer outcomes. Parental mediation showed a moderate positive effect, indicating that guided technology use buffered negative screen-time effects. The significance of all predictors underscored the multidimensional nature of adolescent development in digital contexts.

Cross-City Comparison of Technology Exposure and Behavioral Outcomes

Table 5

Mean Differences Across Lagos, Abuja, and Port Harcourt

City	Screen Time (M)	Behavioral Outcomes (M)	Authoritative Parenting (M)
Lagos (n=180)	5.02	65.11	31.88
Abuja (n=150)	4.41	69.42	33.56
Port Harcourt (n=120)	4.17	70.28	34.10

Interpretation:

Lagos adolescents reported the highest screen time and lowest behavioral outcomes, likely reflecting higher digital saturation in Nigeria's largest metropolitan area. Port Harcourt recorded the highest behavioral adjustment scores, aligning with higher averages in authoritative parenting. These variations highlighted contextual differences in digital culture and parenting norms across major cities.

5. Conclusion

The study had set out to examine the interconnected roles of parenting styles and technology exposure in shaping behavioral outcomes among early adolescents in three major Nigerian cities, and the findings offered compelling evidence that adolescent adjustment remained heavily influenced by the quality of parent–child interaction as well as the nature and intensity of digital consumption. The results had shown that authoritative parenting was strongly associated with positive behavioral outcomes, while authoritarian, permissive, and neglectful parenting styles exerted varying negative influences. At the same time, technology exposure, particularly excessive screen time, had demonstrated a significant inverse relationship with behavioral functioning, suggesting that early adolescents who engaged in prolonged unsupervised digital activities were more prone to hyperactivity, aggression, attention problems, and reductions in academic engagement. Parental mediation had emerged as a crucial buffer, indicating that when parents actively supervised, guided, or co-engaged with adolescents' digital activities, the negative implications of screen time were partially mitigated. Cross-city comparisons revealed that Lagos adolescents,

who experienced the highest digital saturation, had poorer behavioral outcomes than counterparts in Abuja and Port Harcourt, a finding that underscored the environmental and cultural variability of digital lifestyles. The predictive regression model, explaining 55% of the variance in behavioral outcomes, further highlighted that adolescent well-being could not be fully understood outside the dynamic interactions between family processes and digital engagement patterns. Overall, the study illuminated the urgent need for parents, educators, policymakers, and mental health practitioners to adopt integrated intervention approaches that promote responsible technology use, reinforce positive parenting behaviors, and create structured environments that support healthy socio-emotional development. In the broader context of a rapidly digitizing African society, these findings suggested that adolescent behavioral health might increasingly depend on families' ability to adapt parenting practices to the evolving technological landscape while maintaining warmth, communication, monitoring, and consistency. By providing empirical clarity on how both parenting behaviors and digital habits jointly influence early adolescent development, the study contributed meaningfully to scholarly discourse in developmental psychology, digital sociology, and family studies, and it emphasized that future policies and family-strengthening programs must consider the dual realities of parenting and technology as central determinants of adolescent well-being.

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