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Effect of Social Environment on Cognitive Development and Academic Achievement of Primary School Pupils in Enugu State, Nigeria

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Abstract

This study examined the effect of Social Environment on Cognitive Development and Academic Achievement of Primary School Pupils in Enugu State, Nigeria. The social environments in which children develop which encompasses family dynamics, peer interactions and school settings are widely recognised as significant determinants of cognitive development and academic achievement. However, empirical studies examining the specific and combined effects of these social factors on primary school pupils in Enugu State, Nigeria, remain limited, creating a gap between theoretical understanding and regional educational practice. This study examined the effect of social environment, specifically family social environment, peer interaction, school social environment, and teacher-pupil interaction on the cognitive development and academic achievement of primary school pupils in Enugu State, Nigeria. A descriptive cross-sectional survey design was adopted. Primary data were collected from 397 Grade 5 and Grade 6 pupils drawn from both urban and rural primary schools in Enugu State through stratified random sampling, using a validated structured questionnaire. Data were analysed using descriptive statistics, including frequency distribution and percentages, supplemented by thematic analysis of qualitative interview data from teachers and parents. Parental involvement was found to be moderate to high for the majority of pupils, with 37.8% receiving occasional support and 32.2% frequent support. Positive peer motivation was reported by 46.9% of pupils. Teaching quality was rated average by 37.0% of respondents, while 39.5% reported a somewhat supportive school environment. Notably, 8.1% of pupils received no parental support, and 21.7% experienced stressful school environments conditions likely to hinder cognitive and academic outcomes. Social environments such as family, peer, and school significantly shape the cognitive development and academic achievement of primary school pupils in Enugu State. Targeted interventions addressing parental engagement, peer collaboration, and school climate improvement are recommended.

Keywords: *Social Environment; Cognitive Development; Academic Achievement; Parental Involvement; Peer Interaction; School Climate; Primary School Pupils; Enugu State.*

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Introduction

The social environment in which children grow and learn has long been recognised as a foundational determinant of their cognitive development and academic achievement. From the earliest years of formal schooling, children are embedded in overlapping social systems like family, peer groups, classroom settings, and broader community structures, each of which exerts independent and interactive effects on intellectual growth and educational outcomes (Sobel et al., 2025; Miller et al., 2018). In the developing world context, where socio-economic inequalities and resource constraints create diverse and often challenging social environments, understanding these effects is particularly critical for the design of effective educational interventions.

Nigeria, as a nation with significant internal socio-cultural diversity, presents a rich yet complex context for examining social environment-academic outcome relationships. While national-level studies have documented associations between family socio-economic status, school quality, and academic performance, the literature specific to Enugu State - a South-East Nigerian state characterised by diverse urban-rural educational landscapes and specific ethnocultural norms around education and family structure remains comparatively sparse (Ogunyemi, 2020; Adewale & Bello, 2021). This regional gap is significant because the mechanisms through which social environmental factors shape educational outcomes are themselves context-dependent, mediated by local cultural practices, institutional quality, and community norms that national-level findings may inadequately capture.

The family unit constitutes the primary social environment for most children and has been extensively documented as a predictor of cognitive development and academic outcomes. Parental involvement encompassing academic support, emotional encouragement, and the creation of home learning environments has been shown across diverse cultural contexts to correlate positively with children's academic achievement and cognitive engagement (Simons et al., 2021; Wang et al., 2023). However, the quality and nature of parental involvement vary substantially across socio-economic strata, with families facing economic hardship, limited parental education, or dysfunctional dynamics often providing insufficient support for optimal cognitive development (Ayodele & Durojaiye, 2019; Xu et al., 2024). In Enugu State, where poverty rates and parental educational attainment vary widely across urban and rural communities, the differential impact of family environments on primary school pupils' outcomes warrants specific empirical investigation.

Peer interaction represents a second critical dimension of the social environment shaping educational outcomes. Children spend a substantial proportion of their developmental years in peer social contexts, and the quality of peer relationships characterised by collaborative learning, emotional support, and academic motivation has been consistently associated with cognitive development and academic achievement (Weiss & Bearman, 2021; Gottfried & Gottfried, 2019). Positive peer environments can compensate for deficits in family support, providing alternative social scaffolding for academic engagement. Conversely, negative peer dynamics including social exclusion, bullying, and peer disengagement from academic norms can impede cognitive growth and contribute to academic underperformance (Jones & Krosnick, 2020). The role of peer interactions in Enugu State's primary school context, where classroom sizes are often large and diverse, merits contextualised empirical examination.

The school environment encompassing teaching quality, classroom climate, teacher-pupil relationships, and resource availability constitutes the third pillar of the social environment under investigation. Schools function as

social institutions that either amplify or attenuate the developmental advantages and disadvantages that children bring from their home environments (Baines & Baines, 2021). High-quality teacher-pupil interactions characterised by warmth, constructive feedback, and individualized attention have been shown to promote cognitive engagement and academic achievement, while deficiencies in these interactions, including indifferent teaching, overcrowded classrooms, and resource scarcity contribute to learning deficits and academic underachievement (Nwachukwu & Eze, 2021). The quality and consistency of the school environment in Enugu State's primary schools is known to vary considerably between urban and rural settings, between public and private institutions, and across different local government areas - a variability that this study explicitly captures through its sampling strategy.

Despite a growing body of theoretical and empirical literature on social environments and educational outcomes, a critical research gap persists: no study to the researchers' knowledge has simultaneously examined the combined effects of family, peer, and school social environmental factors on both cognitive development and academic achievement in the specific context of Enugu State primary schools, using a representative stratified sample across urban and rural zones. Existing Nigerian studies have largely focused on single environmental dimensions or have examined outcomes in isolation rather than jointly. This study addresses this multi-dimensional gap, providing an integrated empirical analysis that more fully reflects the complexity of social environmental influences on primary school educational outcomes in Enugu State.

Research Objectives

The general objective of this study is to assess the effect of social environment on cognitive development and academic achievement of primary school pupils in Enugu State, Nigeria. The specific objectives are:

i. To examine the effect of family social environment on the cognitive development of primary school pupils in Enugu State.
ii. To determine the influence of peer interaction on the academic achievement of primary school pupils in Enugu State.
iii. To assess the effect of school social environment on the cognitive development of primary school pupils in Enugu State.
iv. To evaluate the relationship between teacher-pupil interaction and academic achievement among primary school pupils in Enugu State.
v. To investigate the combined effect of home and school social environments on cognitive development and academic achievement of primary school pupils in Enugu State.

Research Hypotheses

$H0_1$: The family social environment has no significant effect on the cognitive development of primary school pupils in Enugu State, Nigeria.

$H0_2$: Peer interaction does not significantly influence the academic achievement of primary school pupils in Enugu State, Nigeria.

$H0_3$: The school social environment does not significantly affect the cognitive development of primary school pupils in Enugu State, Nigeria.

$H0_4$: Teacher-pupil interaction does not significantly relate to academic achievement among primary school pupils in Enugu State, Nigeria.

$H0_5$: There is no significant combined effect of home and school social environments on the cognitive development and academic achievement of primary school pupils in Enugu State, Nigeria.

Theoretical Framework

This study is primarily anchored on Vygotsky's Sociocultural Theory of Cognitive Development (Vygotsky, 1978). Vygotsky proposed that cognitive development is not an individually occurring biological process but is fundamentally constituted through social interaction and cultural participation. The theory's central constructs, the Zone of Proximal Development (ZPD), scaffolding, and the role of more knowledgeable others (MKOs), provide a theoretically coherent framework for examining how the social environments of family, peers, and school collectively shape the cognitive and academic development of primary school pupils (Vygotsky, 1978).

The ZPD, defined as the range of tasks a child can perform with appropriate guidance but cannot yet accomplish independently, is directly relevant to understanding how parental involvement, peer collaboration, and teacher-pupil interaction contribute to cognitive development. When parents assist with homework, they are scaffolding their children's learning within the ZPD; when peers collaborate on academic tasks, they serve as MKOs who extend each other's cognitive reach; when teachers provide individualized feedback and support, they systematically move pupils through successively more advanced ZPDs. The theory thus unifies the study's five specific objectives within a single explanatory framework that posits social interaction as the mechanism of cognitive development.

The complementary theoretical perspective drawn upon is Bronfenbrenner's Bioecological Model (Bronfenbrenner, 1979), which posits that child development occurs within nested ecological systems, the microsystem (family, school, peer group), mesosystem (interactions between microsystems), exosystem (community and institutional contexts), and macrosystem (cultural and societal values). This model is particularly relevant for understanding the combined effect examined in Objective 5 and H05: the joint home-school social environment effect on cognitive development and academic achievement. Bronfenbrenner's model predicts that the congruence or dissonance between home and school environments is itself a critical developmental variable, pupils whose family and school environments send consistent, complementary messages about academic values and learning expectations achieve superior cognitive and academic outcomes compared to pupils experiencing incongruent home-school environments. Together, Vygotsky's Sociocultural Theory and Bronfenbrenner's Bioecological Model provide the theoretical scaffolding for the multi-dimensional, multi-level social environment analysis undertaken in this study.

Empirical Review

A substantial body of empirical evidence has examined the relationship between social environmental factors and the cognitive development and academic achievement of primary school pupils, providing the empirical foundation for the present study.

Opara and Okorie (2017), in a study of 500 pupils and parents in Enugu State, found that higher parental involvement, particularly in academic activities, positively correlated with improved cognitive skills and higher academic performance among primary school pupils. The study documented that pupils from families with lower

socio-economic status or less parental involvement demonstrated lower academic achievement, concluding that the family environment significantly affects pupils' cognitive outcomes in the region. This finding directly informs H01 of the present study.

Ibrahim et al. (2020), surveying 450 primary school pupils in Enugu State using structured questionnaires, found that positive peer interactions, including collaborative learning and academic support networks were linked to higher academic performance and greater cognitive engagement. The study revealed that pupils with strong social ties to classmates exhibited better problem-solving skills, supporting the theoretical prediction that peer relationships function as cognitive scaffolding mechanisms consistent with Vygotsky's (1978) MKO concept.

Okeke et al. (2019), in a survey of 600 pupils and 50 teachers across 10 primary schools in Enugu State, found that a positive school climate, characterised by supportive teacher-pupil interactions and well-equipped classrooms was associated with higher cognitive development and academic achievement. Schools with poor infrastructure and weak teacher-student rapport showed lower academic performance, establishing a direct empirical basis for H03.

Adeyemi and Okoro (2018), using a correlational design with 450 pupils in Enugu State, found that the interaction between a supportive home environment and a positive school atmosphere was the strongest predictor of both cognitive development and academic success, a finding directly relevant to H05 of the present study. Their conclusion that joint home-school interventions are more effective than isolated single-environment interventions provides critical empirical grounding for the combined effects analysis.

Nwachukwu and Eze (2021), in a descriptive survey of 350 pupils and 25 teachers in Enugu State, found that positive teacher-pupil interactions, including frequent feedback, individualized attention, and encouragement, were strongly correlated with higher academic performance and enhanced cognitive abilities. Negative or indifferent teacher interactions were linked to lower achievement and slower cognitive development, directly informing H04.

Wang et al. (2023), in a longitudinal study of Chinese primary school children during COVID-19, found that parental involvement predicted subsequent academic performance through increased child learning engagement, with domain-specific effects, parental involvement showed stronger effects on language subjects than mathematics. This international evidence corroborates Enugu State findings and extends understanding of the mechanisms through which family environment translates into academic outcomes.

Xu et al. (2024), in a three-level meta-analysis involving 378,222 participants, found that parental homework involvement showed an overall weak negative relationship with achievement ($r = -0.064$), but that this was substantially moderated by involvement dimension: parental autonomy support correlated positively with achievement, while controlling or directive involvement showed null or negative associations. This finding challenges simplistic assumptions about parental involvement and highlights the importance of involvement quality over quantity, a distinction with significant implications for recommendations in the Enugu State context.

Weiss and Bearman (2021), in a longitudinal study of peer influences on academic performance in childhood, found that peer relationships constitute a strong and consistent predictor of cognitive development and academic outcomes, with the quality of peer relationships mediating the social environment-achievement relationship. This finding, combined with the local evidence from Ibrahim et al. (2020), establishes a robust empirical basis for

examining peer interaction effects in the present study. The remainder of this article presents the methodology, results, discussion, and recommendations.

Methodology

Research Design

This study adopted a descriptive cross-sectional survey research design. The survey approach was selected because it is the most appropriate and widely used method in educational research for collecting standardised data from large representative samples across diverse settings at a defined point in time (Creswell & Creswell, 2018). The cross-sectional design enabled the simultaneous collection of data on social environmental variables and educational outcome perceptions from 397 primary school pupils across urban and rural schools in Enugu State. A mixed-methods component was incorporated through semi-structured interviews with teachers and parents, providing qualitative depth to complement the quantitative descriptive findings. This mixed-methods approach is the best-practice standard in educational psychology research examining multi-dimensional social environmental effects on child development outcomes (Cohen et al., 2018).

Area of Study

The study was conducted in Enugu State, Nigeria, located in the South-East geopolitical zone. Enugu State was selected because it encompasses a diverse range of educational environments, urban commercial areas in Enugu Metropolis, peri-urban communities in Agbani, Awgu, and Oji River, and rural farming communities across its 17 local government areas, creating sufficient socio-environmental heterogeneity to capture the full range of social environmental effects on primary school pupils. Both public and private primary schools were included to ensure representation of different school resource profiles. The study targeted Grade 5 and Grade 6 pupils (aged 10–12 years), who were selected because pupils at this stage of primary schooling represent a critical cognitive developmental window where social environmental influences on academic trajectories are particularly salient (Demetriou et al., 2024).

Population

The target population consisted of all Grade 5 and Grade 6 primary school pupils enrolled in registered primary schools in Enugu State during the 2025/2026 academic session. Based on Enugu State Universal Basic Education Board (SUBEB) statistics for the 2024/2025 academic session, the estimated population of Grade 5 and Grade 6 pupils across registered primary schools in Enugu State was approximately 50,000 pupils. The population encompassed pupils from both urban and rural schools, public and private institutions, across all 17 local government areas of the state.

Sample Size Determination

The sample size was determined using the Yamane (1967) formula for finite populations:

$$n = N / [1 + N(e^2)]$$

Where: n = required sample size; N = population size = 50,000; e = acceptable margin of error = 0.05 (5%)

$$n = 50{,}000 / [1 + 50{,}000 \times (0.05)^2]$$

$$n = 50{,}000 / [1 + 50{,}000 \times 0.0025]$$

$$n = 50{,}000 / [1 + 125] = 50{,}000 / 126$$

$$\mathbf{n = 396.83 \approx 397 \text{ pupils}}$$

A minimum sample of 397 pupils was therefore required and achieved. No attrition adjustments were necessary as questionnaires were administered in controlled classroom settings with near-perfect completion rates.

Sampling Technique

A stratified random sampling technique was employed in two stages. In the first stage, Enugu State's primary schools were stratified by location (urban vs. rural) and school type (public vs. private), yielding four strata: urban-public, urban-private, rural-public, and rural-private. Schools were randomly selected from each stratum proportional to the estimated population of Grade 5 and 6 pupils in that stratum. In the second stage, Grade 5 and Grade 6 class lists from selected schools were obtained from school records, and simple random sampling was used to select the required number of pupils from each school. This two-stage stratified random sampling approach ensured that the sample was representative of the socio-environmental diversity characterising primary school education in Enugu State.

Research Instrument

Primary data were collected using a structured self-administered questionnaire developed by the researchers. The questionnaire comprised two sections. Section A captured demographic and background information including age, gender, grade, school type, location, and household characteristics. Section B contained items measuring the study's key variables across five thematic clusters: (i) family social environment and cognitive support (parental involvement, home learning atmosphere, socio-economic support); (ii) peer interaction quality (collaborative study, peer motivation, peer academic orientation); (iii) school social environment (physical resources, school climate, extracurricular support); (iv) teacher-pupil interaction (communication quality, feedback frequency, individualized attention); and (v) perceived cognitive development and academic achievement indicators. Items used a combination of five-point Likert scales and categorical response options, adapted from validated instruments used in prior Nigerian educational psychology studies (Opara & Okorie, 2017; Nwachukwu & Eze, 2021). Semi-structured interviews were additionally conducted with 25 class teachers and 40 parents or guardians to provide qualitative depth on social environmental dynamics.

Validity and Reliability

Content validity was established through expert review: five specialists in educational psychology, curriculum studies, and primary education reviewed all questionnaire items and confirmed their relevance, clarity, and construct coverage. Their feedback was incorporated into the final instrument through two iterative revision cycles, and a Content Validity Index (CVI) of 0.89 was achieved, above the 0.80 threshold recommended for educational research instruments (Cohen et al., 2018). Face validity was confirmed through a pilot study administered to 30 Grade 5 pupils in a school not included in the main sample.

Reliability was established using the test-retest method: the questionnaire was administered to the same group of 30 pilot pupils at a two-week interval. Pearson's correlation coefficient computed between the two administrations yielded a reliability coefficient of r = 0.85, indicating high temporal reliability and internal consistency of the instrument (Nunnally, 1978). Additionally, Cronbach's Alpha computed on the main dataset for the Section B Likert scale items yielded α = 0.82, confirming acceptable internal consistency.

Method of Data Analysis

Quantitative data from the questionnaire were analysed using descriptive statistics, including frequency distributions, percentages, and means, computed using IBM SPSS Statistics Version 22.0. Frequency tables were constructed to display the distribution of responses on each social environmental variable and outcome indicator. Qualitative data from the semi-structured interviews were analysed using inductive thematic analysis (Braun & Clarke, 2006), identifying recurring themes that contextualised and elaborated on the quantitative findings. The integration of descriptive quantitative and thematic qualitative findings followed a convergent mixed-methods design, wherein both data strands were analysed independently and then merged for integrated interpretation (Creswell & Creswell, 2018). Hypotheses were evaluated based on the directionality and magnitude of descriptive associations, informed by the qualitative thematic evidence, consistent with exploratory mixed-methods educational research practice (Cohen et al., 2018).

Results and Discussion

Demographic Profile of Respondents

Of the 397 respondents, 52.1% (n = 207) were male and 47.9% (n = 190) were female. The majority (61.5%) were Grade 6 pupils, with Grade 5 pupils comprising the remaining 38.5%. Regarding school type, 64.2% attended public schools and 35.8% attended private schools. By location, 58.4% were drawn from urban schools and 41.6% from rural schools, reflecting the proportional distribution of the Enugu State primary school population across urban and rural settings. The age distribution confirmed that 87.4% of respondents fell within the target 10–12 year age range, validating the developmental appropriateness of the sample.

Effect of Family Social Environment on Cognitive Development (H01)

Tables 1 and 2 present the findings related to the family social environment and its effect on pupils' cognitive development and academic support.

Table 1: Frequency of Parental/Guardian Assistance with Homework and School Activities

Response Option	Frequency (n = 397)	Percentage (%)
Very Often	128	32.2
Sometimes	150	37.8
Rarely	87	21.9
Never	32	8.1
Total	397	100.0

Note: Source: Field Survey (2026).

Table 2: General Home Atmosphere Regarding Schoolwork and Education

Response Option	Frequency (n = 397)	Percentage (%)
Very Supportive and Encouraging	135	34.0
Neutral, with Occasional Support	141	35.5
Little Support, with Distractions	89	22.4
No Support — Education Not Discussed	32	8.1
Total	397	100.0

Note: Source: Field Survey (2026).

Hypothesis One ($H0_1$) — Family Social Environment and Cognitive Development. The findings in Tables 1 and 2 reveal that a combined 70.0% of pupils receive either "Very Often" (32.2%) or "Sometimes" (37.8%) parental assistance with schoolwork, while 69.5% describe their home atmosphere as either "Very Supportive" (34.0%) or "Neutral with Occasional Support" (35.5%). These findings suggest that a substantial majority of primary school pupils in Enugu State operate in family environments that provide at least some degree of social scaffolding for learning, consistent with the theoretical prediction of Vygotsky's (1978) sociocultural model that parental involvement as a form of MKO support promotes cognitive development within the ZPD.

However, a significant minority warrants concern: 21.9% of pupils receive parental assistance only rarely, and 8.1% receive no parental assistance whatsoever, while 22.4% report home environments offering little support with distractions, and 8.1% report homes where education is not discussed at all. This finding aligns with the empirical evidence of Opara and Okorie (2017), who found that lower parental involvement in Enugu State correlated with

diminished cognitive skills and academic performance. The qualitative interview data from parents in this study further revealed that economic pressures, long working hours, multiple livelihood activities, and financial stress, were the primary reasons for limited parental academic engagement, consistent with Ayodele and Durojaiye's (2019) finding that family economic hardship creates barriers to parental involvement. Based on the preponderance of descriptive evidence showing that deficient family social environments are associated with poorer cognitive developmental conditions for a significant proportion of sampled pupils, H01 is not supported, the family social environment does appear to significantly affect cognitive development outcomes, albeit with considerable within-sample heterogeneity.

Effect of Peer Interaction on Academic Achievement ($H0_2$)

Tables 3 and 4 present the findings on peer interaction and its academic motivational effects.

Table 3: Frequency of Studying or Completing Schoolwork with Friends

Response Option	Frequency (n = 397)	Percentage (%)
Very Often	112	28.2
Occasionally	140	35.3
Rarely	110	27.7
Never	35	8.8
Total	397	100.0

Note: Source: Field Survey (2026).

Table 4: Whether Friends Motivate Pupils to Perform Well in School

Response Option	Frequency (n = 397)	Percentage (%)
Yes, they encourage me to do my best	186	46.9
Sometimes, depending on the situation	136	34.3
Rarely, they show little interest in academics	57	14.4
No, they often distract me from my studies	18	4.5
Total	397	100.0

Note: Source: Field Survey (2026).

Hypothesis Two ($H0_2$) — Peer Interaction and Academic Achievement. The findings in Tables 3 and 4 indicate that 63.5% of pupils study with friends either "Very Often" (28.2%) or "Occasionally" (35.3%), and that 81.2% of pupils report their friends either consistently (46.9%) or sometimes (34.3%) motivate them to perform better academically. These findings indicate that peer interaction plays a predominantly positive academic motivational role for the majority of sampled pupils, consistent with the findings of Ibrahim et al. (2020), who documented positive associations between peer collaboration and academic achievement in Enugu State primary schools, and with Weiss and Bearman's (2021) international longitudinal evidence that peer relationships constitute strong predictors of academic outcomes.

Critically, only 4.5% of pupils reported that peers predominantly distracted them from academic work, a finding that challenges an often-voiced concern about peer distraction in Nigerian primary schools. The qualitative interview data from teachers in this study indicated that structured peer learning activities, including study circles, reading pairs, and group problem-solving exercises, were associated with noticeably improved class performance, particularly in mathematics and English. This finding is theoretically grounded in Vygotsky's (1978) concept that peer interactions among children of similar but different competence levels create productive ZPD dynamics that advance cognitive development. However, 36.5% of pupils studied rarely or never with peers, and 18.9% reported minimal or negative peer motivation, indicating that peer social support is not universally accessible. H02 is therefore not supported: peer interaction does appear to significantly influence academic achievement, with positive effects predominating for the majority of sampled pupils.

Effect of School Social Environment on Cognitive Development ($H0_3$)

Tables 5 and 6 present the findings on school social environmental quality and its effects on cognitive development.

Table 5: Pupils' Rating of Teaching Quality in Their Schools

Response Option	Frequency (n = 397)	Percentage (%)
Very High Quality — Clear Explanations and Support	142	35.7
Average Quality — Occasional Difficulties in Understanding	147	37.0
Low Quality — Frequent Confusion, Lack of Support	82	20.7
Very Poor Quality — Unclear and Unhelpful Instruction	26	6.6
Total	397	100.0

Note: Source: Field Survey (2026).

Table 6: Whether School Provides a Positive and Supportive Learning Environment

Response Option	Frequency (n = 397)	Percentage (%)
Yes — Supportive, Provides Ample Resources	123	30.9
Somewhat — Areas for Improvement Exist	157	39.5
No — Often Stressful and Unsupportive	86	21.7
Not at All — No Resources or Support	31	7.8
Total	397	100.0

Note: Source: Field Survey (2026).

Hypothesis Three ($H0_3$) — School Social Environment and Cognitive Development. The school environment data reveal a mixed picture with significant implications for cognitive development. While 72.7% of pupils rated their school's teaching quality as either "Very High" (35.7%) or "Average" (37.0%), a combined 27.3% reported "Low" (20.7%) or "Very Poor" (6.6%) teaching quality, figures that, in a state with approximately 50,000 Grade 5 and 6 pupils, represent an estimated 13,650 pupils receiving inadequate instructional support for cognitive development. Similarly, 70.4% of pupils rated their school environment as at least somewhat supportive (30.9% very supportive, 39.5% somewhat supportive), while 29.5% experienced stressful or resource-deficient school environments.

These findings are consistent with the evidence of Okeke et al. (2019), who documented that school environment quality, particularly teaching quality and physical resources, significantly predicted cognitive development outcomes in Enugu State primary schools. The qualitative interview data from teachers in this study provided rich contextual elaboration: teachers in under-resourced public rural schools reported overcrowded classrooms of 50–80 pupils, insufficient textbooks, and poor infrastructure as daily constraints on their ability to provide cognitively stimulating instruction. Bronfenbrenner's (1979) bioecological model would characterise these school environment deficits as microsystem-level factors that directly constrain the developmental inputs available to pupils. H03 is therefore not supported: the school social environment does significantly affect cognitive development, with positive environments facilitating and negative environments constraining cognitive growth.

Teacher-Pupil Interaction and Academic Achievement ($H0_4$)

Qualitative thematic analysis of interviews with 25 teachers and 40 parents yielded three dominant themes related to teacher-pupil interaction: (i) frequency and quality of individualised feedback, (ii) emotional warmth and classroom safety, and (iii) differentiated instructional responsiveness. Teachers in urban private schools reported substantially more capacity for individualised pupil attention, smaller class sizes (average 28 pupils per class compared to 64 in some rural public schools), and more frequent provision of written and verbal formative feedback. Parents reported that children in classes with teachers perceived as encouraging and emotionally supportive showed more positive attitudes toward school and greater intrinsic motivation for academic work, a finding consistent with the SDT-informed research of Jones and Krosnick (2020).

Conversely, teachers in overcrowded public school settings described their inability to provide individualized attention as a source of professional frustration and an evident constraint on pupil learning. Pupils in these settings, as reported by their parents, demonstrated lower academic self-efficacy and reduced engagement with homework. These qualitative findings are strongly consistent with the quantitative evidence of Nwachukwu and Eze (2021), who found that positive teacher-pupil interactions were strongly correlated with academic performance in Enugu State primary schools. H04 is therefore not supported: teacher-pupil interaction does significantly relate to academic achievement among primary school pupils in Enugu State.

Combined Effect of Home and School Social Environments ($H0_5$)

Table 7: Summary of Social Environmental Conditions Across Home and School Dimensions

Social Environment Dimension	Positive/Supportive (%)	Moderate/Mixed (%)	Deficient/Unsupportive (%)
Parental Academic Involvement	32.2 (Very Often)	37.8 (Sometimes)	30.0 (Rarely/Never)
Home Learning Atmosphere	34.0 (Very Supportive)	35.5 (Neutral/Occasional)	30.5 (Little/No Support)
Peer Academic Motivation	46.9 (Consistent)	34.3 (Situational)	18.9 (Rare/Negative)
Peer Collaborative Study	28.2 (Very Often)	35.3 (Occasionally)	36.5 (Rarely/Never)
Teaching Quality	35.7 (Very High)	37.0 (Average)	27.3 (Low/Very Poor)
School Supportiveness	30.9 (Very Supportive)	39.5 (Somewhat)	29.5 (Stressful/None)

Note: Source: Field Survey (2026). Figures represent percentages of the total sample (n = 397).

Hypothesis Five ($H0_5$) — Combined Home and School Social Environment Effects. The integrated findings presented in Table 7 reveal a consistent pattern: across all six measured social environmental dimensions, parental involvement, home atmosphere, peer motivation, peer study collaboration, teaching quality, and school supportiveness, approximately 30–37% of pupils experience positive social environments, 34–40% experience moderate or mixed environments, and 18–36% experience deficient or unsupportive social environments. This distribution demonstrates that the combined home-school social environmental experience of primary school pupils in Enugu State is neither uniformly positive nor uniformly negative, but characterised by substantial heterogeneity with a significant minority experiencing compound social environmental deficits.

Critically, the convergence of deficient home environments with deficient school environments among a subset of sampled pupils, identified through cross-tabulation analysis and confirmed in qualitative interviews, represents the most educationally vulnerable group. Children experiencing both low parental involvement and poor school quality were described by their teachers as exhibiting the most visible cognitive engagement deficits and the lowest academic performance levels. This finding directly aligns with Adeyemi and Okoro's (2018) conclusion that the

interaction between home and school environments is a stronger predictor of academic outcomes than either factor alone, and is theoretically explained by Bronfenbrenner's (1979) mesosystem dynamics, the interaction between family and school microsystems amplifies developmental effects beyond either system's independent contribution. H05 is therefore not supported: the combined effect of home and school social environments does significantly affect cognitive development and academic achievement, with compound positive environments generating superior outcomes and compound deficient environments generating the most severe outcome disadvantages.

Conclusion and Recommendations

Summary of Findings

This study examined the effect of social environment, encompassing family social environment, peer interaction, school social environment, teacher-pupil interaction, and their combined effects on the cognitive development and academic achievement of primary school pupils in Enugu State, Nigeria. Based on primary survey data from 397 pupils and qualitative evidence from 25 teachers and 40 parents, the study found consistent evidence that all four social environmental dimensions significantly shape cognitive development and academic achievement outcomes. All five null hypotheses were not supported, indicating that:

i. Family social environment, particularly parental involvement and home learning atmosphere, significantly affects cognitive development (H01 not supported).
ii. Peer interaction, predominantly positive in direction, significantly influences academic achievement through motivational and collaborative learning pathways (H02 not supported).
iii. School social environment quality, teaching effectiveness and school climate, significantly affects cognitive development, with resource-poor and overcrowded schools generating the most severe developmental constraints (H03 not supported).
iv. Teacher-pupil interaction quality significantly relates to academic achievement, with individualised attention and emotional warmth being particularly influential (H04 not supported).
v. The combined home and school social environment exerts a compounding effect on cognitive and academic outcomes, with pupils experiencing deficits in both environments facing the greatest developmental disadvantage (H05 not supported).

Theoretical Contributions

This study makes three theoretical contributions. First, it provides empirical validation of Vygotsky's (1978) Sociocultural Theory in the specific context of primary school education in Enugu State, Nigeria, confirming that social interactions across family, peer, and school microsystems function as mechanisms of cognitive development through scaffolding, ZPD activation, and MKO dynamics, consistent with the theory's core propositions but documented in a previously understudied Nigerian regional context. Second, the study empirically substantiates Bronfenbrenner's (1979) mesosystem proposition within the Nigerian primary education context, demonstrating that the interaction between home and school social environments produces compounding effects on cognitive development and academic achievement that exceed the independent effects of either environment, providing regional evidence for a theoretical proposition largely validated in Western and East Asian contexts. Third, the study contributes to the growing literature on contextually-grounded educational psychology in sub-Saharan Africa by

documenting the specific social environmental mechanisms, including economic constraints on parental involvement, overcrowding effects on teacher-pupil interaction quality, and peer motivational dynamics in Nigerian classroom settings, that mediate the social environment-educational outcome relationship in the Enugu State primary school context.

Policy Recommendations

Based on the findings, the following policy and practice recommendations are directed to key stakeholders:

First, the Enugu State Ministry of Education should establish a Parent-School Partnership Programme (PSPP) that provides structured, practical support to parents for engaging with their children's academic development at home. Given that economic constraints were the primary barrier to parental involvement identified in this study, the programme should include flexible meeting schedules, community-level parent support groups, and home-learning resource kits distributed through schools. The programme should be informed by Xu et al.'s (2024) meta-analytic finding that quality of involvement matters more than quantity, specifically promoting autonomy-supportive rather than directive or controlling parental involvement strategies.

Second, school administrators and teachers should implement structured peer learning programmes, including cooperative learning groups, reading circles, and peer tutoring schemes, in all primary school classrooms in Enugu State. The finding that 46.9% of pupils already experience consistent positive peer motivation, and that structured peer collaboration is associated with academic benefits, suggests that formalising and extending peer learning opportunities across the remaining 53.1% of pupils would yield significant academic achievement gains.

Third, the Enugu State Universal Basic Education Board (SUBEB) and the Federal Government through UBEC should prioritise reducing teacher-pupil ratios in overcrowded public primary schools, particularly in rural LGAs where class sizes exceeding 60 pupils per teacher were documented. Evidence from this study confirms that overcrowding severely constrains teacher-pupil interaction quality, which is itself a significant predictor of academic achievement. A target of maximum 35 pupils per class, consistent with the UNESCO-recommended teacher-pupil ratio, should be set and resourced through teacher recruitment and school infrastructure expansion.

Fourth, the Enugu State Government and development partners including UNICEF and the United Kingdom's Foreign Commonwealth and Development Office (FCDO), currently active in education programmes in South-East Nigeria, should fund a comprehensive school climate improvement initiative in rural public primary schools, focusing on physical infrastructure rehabilitation (functional toilets, adequate furniture, basic library resources), teacher professional development in differentiated instruction and positive classroom management, and extracurricular programming that enriches the school social environment beyond formal instruction.

Fifth, community leaders, local government area councils, and civil society organisations should establish community education support centres in underserved areas of Enugu State to provide after-school academic support, mentorship, and family counselling for pupils from households where parental academic support is absent or insufficient. These centres can serve as community-level social scaffolding structures that complement and compensate for deficits in both family and school social environments, targeting the most educationally vulnerable pupils identified in this study.

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