

Family Environment and Learning Motivation in a MABA-Supported Context: Associations with Elementary Students' Communication Skills

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Abstract

This study aims to examine whether family environment and learning motivation measured within a MABA (*Majalah Bahasa Indonesia*)-supported learning context are associated with fourth-grade students' communication skills in Indonesian language learning. Using a quantitative, non-experimental, cross-sectional ex-post facto design, the study involved the entire Grade 4 cohort at SD Negeri 1 Krangganharjo, Central Java ($n = 12$), selected through saturated sampling. Family environment and MABA-context motivation were measured using structured questionnaires, while communication skills were assessed separately; the data were analyzed using exploratory multiple linear regression with 95% confidence intervals and model-fit statistics. The results showed that family environment was positively associated with communication skills ($B = 0.170$, 95% CI [0.021, 0.319], $\beta = .540$, $p = .030$), as was MABA-context learning motivation ($B = 0.348$, 95% CI [0.063, 0.633], $\beta = .578$, $p = .023$). The overall model was statistically significant, $F(2, 9) = 6.817$, $p = .016$, explaining 60.2% of the observed variance ($R^2 = .602$; adjusted $R^2 = .514$). These findings provide preliminary support for the view that home learning conditions and motivational engagement may function as complementary correlates of communication performance. However, the very small single-school sample, cross-sectional design, possible construct overlap, and incomplete psychometric evidence limit causal and population-level inference. Future studies should replicate the model with larger, diverse samples and validated, clearly differentiated measures.

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Introduction

Communication skills are a central outcome of Indonesian language learning because students are expected to comprehend texts, organize and retell information, articulate opinions, and participate in classroom discussion. However, recent evidence from Indonesian elementary education shows that oral communication remains uneven: an upper-grade study reported only moderate performance, with recurring difficulties in articulation, diction, and confidence when speaking in class (Anggraini, 2026). This practical problem is important because communication competence develops through repeated opportunities to interpret, formulate, and express meaning across oral and written activities. Experimental work with elementary pupils also shows that structured opportunities to rehearse and revise oral performance can improve aspects of oral language, underscoring the need to identify the learning conditions associated with students' communicative participation (Colognesi et al., 2023).

One relevant condition is the family/home learning environment. Home literacy resources and parent-child literacy interactions can provide opportunities for vocabulary growth, discussion,

and language use beyond school, but the strength of these associations varies by context and measurement. A meta-analysis of low- and middle-income countries found a small overall association between home language/literacy environments and children's language and literacy, with stronger relations for adult literacy practices and books at home than for generic home tutoring (Nag et al., 2024). Longitudinal evidence also links informal and formal home literacy practices with growth in vocabulary and reading (Sénéchal & LeFevre, 2014). Importantly for the Indonesian context, Adam et al. (2025) found that caregiver language and literacy skills were more directly related to children's early language and literacy than the home literacy environment itself, indicating that family effects should be examined cautiously rather than assumed to be uniform.

Learning motivation is a second condition that may be associated with language engagement. Self-determination theory distinguishes more autonomous forms of motivation from controlled motivation and proposes that interest, perceived competence, and internalized value help sustain engagement in learning activities (Ryan & Deci, 2020). In early elementary reading, intrinsic motivation has been associated with reading amount and comprehension, and longitudinal evidence suggests reciprocal relations between motivation and comprehension rather than a simple one-way effect (Stutz et al., 2016; Schiefele et al., 2016). In this study, motivation is interpreted primarily through interest in MABA, enjoyment, concentration, effort, and persistence. Because the original motivation instrument also included participation or willingness-to-communicate content, potential overlap with the communication outcome is treated as a measurement-validity threat rather than as evidence of a pure motivational effect.

MABA (Majalah Bahasa Indonesia) is the instructional context in which motivation was measured. In the source study, MABA functioned as a print-based supporting medium containing reading texts, articles, illustrations, and literacy-oriented material. It was not randomly assigned, experimentally manipulated, or treated as an independent intervention. Accordingly, the present manuscript does not evaluate the causal effectiveness of MABA; it examines whether students' motivational engagement while learning in a MABA-supported classroom is associated with their communication skills.

The proposed relationships are anchored in two complementary frameworks. The bioecological model of human development emphasizes proximal processes within children's immediate contexts, including routine interactions in the family and school microsystems (Bronfenbrenner & Morris, 2006). Self-determination theory explains how the quality of students' motivation can shape sustained engagement with learning activities (Ryan & Deci, 2020). Applied here, family environment represents a contextual source of language and literacy opportunities, whereas motivation represents a learner-level propensity to engage with literacy tasks in the classroom. MABA is the classroom context in which that motivation is observed. The regression model therefore tests additive associations among these factors; it does not test a statistical interaction term or a causal developmental mechanism.

Prior studies illuminate separate parts of this model but leave the combined question unresolved. Adam et al. (2025) examined family literacy and children's early language/literacy in rural Java but did not include learning motivation or a broader communication outcome. Stutz et al. (2016) and Schiefele et al. (2016) examined motivation and reading comprehension in early elementary students but did not model family environment. Colognesi et al. (2023) demonstrated that classroom practice can improve oral language, but their intervention did not examine family

conditions or MABA-context motivation. Thus, the incremental contribution of the present study is not to establish a general explanatory model, but to explore whether family environment and motivation measured in a print-supported Indonesian language context are concurrently associated with communication performance in one Grade 4 cohort.

This gap is especially relevant because the communication outcome used in the source study spans receptive and productive activities reading comprehension, retelling, sentence construction, oral/written expression, and discussion participation rather than general achievement alone. Examining the two predictors in one model can provide preliminary, context-specific evidence about whether home conditions and motivational engagement covary with this broader communication construct.

The study is therefore framed as an exploratory, cross-sectional associational analysis. Family environment and learning motivation in the MABA-supported context are entered as statistical predictors only in the regression sense; the design does not permit causal direction, developmental pathways, or population-level predictive validity to be established.

Within this bounded framework, the study asks whether each predictor is associated with communication skills after accounting for the other predictor and whether the two-variable model explains a nontrivial share of observed variation in this sample. Estimate uncertainty and the consequences of the very small sample are emphasized throughout the interpretation.

Accordingly, the study addresses three questions: (1) Is family environment positively associated with elementary students' communication skills in Indonesian language learning? (2) Is learning motivation measured in the MABA-supported context positively associated with communication skills? and (3) Do the two predictors jointly account for statistically detectable variation in communication skills in this sample? The corresponding hypotheses concern positive partial regression coefficients for family environment and MABA-context motivation and a statistically significant overall additive regression model.

Method

This study used a quantitative, non-experimental, cross-sectional ex-post facto design to examine concurrent associations among family environment, learning motivation measured in a MABA-supported context, and elementary students' communication skills. The variables were observed under naturally occurring conditions, with no manipulation or treatment assignment. Multiple linear regression was retained as an exploratory associational model rather than as a basis for causal inference or out-of-sample prediction. Cross-sectional designs are appropriate for estimating concurrent associations at a defined time point, but they do not establish temporal precedence or causal direction (Wang & Cheng, 2020). Comparable recent educational studies have likewise used cross-sectional correlational designs while explicitly distinguishing statistical association from causal inference (Emilda & Susanti, 2026; Suwidiyanti et al., 2026).

Participants were all fourth-grade students enrolled at SD Negeri 1 Krangganharjo, Central Java, Indonesia, at the time of data collection. The accessible population consisted of 12 students, and saturated sampling included the entire cohort: six boys and six girls. Including the full cohort avoids within-class sampling error, but it does not solve the low-power and coefficient-instability problems associated with estimating a two-predictor regression from only 12 cases. The regression is therefore explicitly treated as exploratory and sample-bound. All 12 fourth-grade students enrolled in the class were included in the study through saturated sampling; therefore, no students from the accessible

population were excluded. The participants consisted of six boys and six girls and were studying within the same classroom and Indonesian language curriculum. Because the study involved the entire accessible Grade 4 cohort, the participants shared a relatively similar educational setting and exposure to classroom instruction. Detailed socioeconomic, home-language, and prior-achievement characteristics were not collected as part of the original study. Because the study observed the entire accessible classroom cohort, the sample is complete for that setting but remains statistically small for regression inference; contemporary guidance therefore recommends an explicit sample-size justification and cautious interpretation when inferential precision is constrained by very small samples (Lakens, 2022).

The research took place during Indonesian language learning in which MABA (Majalah Bahasa Indonesia) was already used as a supporting print medium. The source manuscript describes MABA as containing reading texts, articles, illustrations, and literacy-oriented materials intended to support student engagement with language. Because MABA was part of routine instruction rather than a controlled intervention, exposure to the medium is treated only as contextual background for the motivation measure. MABA (Majalah Bahasa Indonesia) was used by the classroom teacher as supplementary print-based material during Indonesian language learning. It contained reading texts, short articles, illustrations, and literacy-oriented activities designed to encourage students to read, understand information, and communicate their ideas. MABA was integrated into regular classroom instruction rather than implemented as a researcher-controlled intervention. Consequently, students' exposure to MABA represented their naturally occurring learning experience. The frequency and duration of MABA use was two weeks.

Three variables were analyzed. Family environment (X_1) was operationalized as a composite of parent-child communication, parental attention and learning support, home literacy habits, emotional support, and learning facilities. Learning motivation in the MABA-supported context (X_2) represented students' motivational engagement during Indonesian language learning. Communication skills (Y) represented the study outcome.

For substantive interpretation, MABA-context motivation is defined through interest in the magazine content, enjoyment of learning, concentration, effort to understand the material, and persistence in learning activities. The source instrument also appears to include active participation and willingness to express ideas. Because those indicators approach the content of the communication outcome, they may reduce discriminant validity; consequently, the regression coefficient is not interpreted as a pure effect of motivation. When item-level data are available, the preferred sensitivity analysis is to recompute the motivation composite after removing indicators that directly measure communication behavior. Transparent construct definition and explicit evidence of discriminant validity are particularly important when predictor and outcome indicators may overlap (Flake & Fried, 2020; Rönkkö & Cho, 2022).

Communication skills were operationalized as a composite covering comprehension of reading materials, coherent retelling, clear and systematic sentence construction, expression of opinions, and participation in classroom discussion. These dimensions span receptive, oral, and written competencies. The communication-skills score was treated as a composite because all assessed dimensions represented complementary receptive and productive components of communicative competence in Indonesian language learning. The assessment covered comprehension of reading materials, coherent retelling, construction of clear and systematic

sentences, expression of opinions, and participation in classroom discussion. Scores across these dimensions were aggregated to represent students' overall communication performance. Because the original study did not conduct a separate factor analysis of these dimensions, the composite should be interpreted as an operational classroom measure rather than as a fully validated latent construct. Contemporary measurement guidance further cautions that composite scores should not be treated as fully validated latent constructs without evidence concerning internal structure, reliability, and construct validity (McNeish, 2022; Rosellini & Brown, 2021).

Data were collected using questionnaires for family environment and MABA-context motivation together with a separate communication-skills assessment. For reproducibility, instrument properties must be reported at the scale level rather than inferred from the regression results. Family environment and learning motivation through MABA were measured using structured questionnaires based on the indicators operationalized in the study. The family-environment questionnaire covered parent-child communication, parental attention and learning support, home literacy practices, emotional support, and learning facilities. The learning-motivation questionnaire covered interest in MABA, enthusiasm for reading and understanding its content, active participation, persistence in learning, and willingness to express ideas. Students responded to the questionnaire items using an ordinal response scale. Communication skills were assessed separately through classroom-based indicators covering reading comprehension, retelling, sentence construction, expression of opinions, and discussion participation. Internal-consistency coefficients and inter-rater reliability were not reported in the original dataset; therefore, this represents a methodological limitation of the study. Recent psychometric guidance recommends reporting reliability estimates appropriate to the scale structure rather than relying mechanically on coefficient alpha, while also documenting item content, scoring rules, and validity evidence transparently (Flora, 2020; Hayes & Coutts, 2020; Sijsma & Pfadt, 2021). Recent Indonesian educational research likewise illustrates the value of explicitly aligning instruments, data-collection procedures, and analytic strategies with the constructs being assessed (Hidayah & Sodikin, 2026; Rokhman et al., 2024).

Data collection occurred in the natural Grade 4 learning context, and no treatment was administered. The analysis used the students' observed conditions at a single point in time. Data collection was conducted during regular Indonesian language learning in the Grade 4 classroom. The questionnaires were administered directly to the participating students after instructions regarding the response procedure had been provided. Students were encouraged to respond according to their actual learning and family experiences rather than perceived desirable responses. The communication-skills assessment was conducted within the same instructional context. All 12 participating students provided complete responses, and no cases were excluded from the statistical analysis. Using a separate communication-skills assessment rather than the same questionnaire for every construct partly reduces shared-method concerns, although questionnaire-based predictors may still be affected by systematic response tendencies and common-method variance (Baumgartner et al., 2021; Shimada & Katahira, 2023).

Before fitting the regression model, the source analysis examined normality, linearity, multicollinearity, and heteroscedasticity. Because $n = 12$ provides very limited power for significance-based assumption tests, these tests are treated as descriptive diagnostics rather than definitive proof that assumptions hold. The reported Kolmogorov-Smirnov, deviation-from-linearity, tolerance/VIF, and Glejser results are retained, but interpretation is deliberately cautious.

Permission to conduct the study was obtained from the school before data collection. Participation involved students enrolled in the selected Grade 4 class, and the research procedures were conducted within the regular educational setting. Students' identities were kept confidential, and the data were analyzed and reported in aggregate form without disclosing personally identifiable information. Participation did not affect students' academic grades or access to learning activities. With very small samples, significance-based diagnostic tests have limited sensitivity; consequently, non-significant normality tests should not be treated as proof that distributional assumptions are satisfied (Knief & Forstmeier, 2021).

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

The fitted model was $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$, where Y is communication skills, X_1 is family environment, and X_2 is MABA-context learning motivation. Partial coefficients were evaluated with t tests and the overall additive model with an F test at $\alpha = .05$. To avoid reliance on p values alone, the revision also reports 95% confidence intervals for B , R^2 , adjusted R^2 , and an observed f^2 for the fitted sample. No $X_1 \times X_2$ interaction term was specified or tested; therefore, "joint" refers to the additive two-predictor model rather than statistical interaction. Consistent with contemporary recommendations, statistical inference is interpreted jointly through regression coefficients, uncertainty intervals, model fit, and substantive context rather than through dichotomous p -value thresholds alone (Lakens, 2021; Maier & Lakens, 2022).

Result and Discussion

Results

This section reports descriptive statistics available in the manuscript, assumption checks, the exploratory multiple regression model, and hypothesis tests. Because the raw dataset was not included in the reviewer files, statistics that require case-level data are flagged for author verification rather than reconstructed.

Descriptive Findings

The available source reports mean scores of 2.79 for family environment, 2.90 for MABA-context learning motivation, and 2.95 for communication skills. These means are presented descriptively only. The earlier qualitative label "good" is not retained as an analytical conclusion because the manuscript does not report the possible scale range or the cut-off criteria used to define that category.

At the item-content level, the family-environment description emphasizes parental assistance, recognition of students' opinions, parent-child communication, and parental modelling. The MABA-context motivation description emphasizes interest in the magazine, enjoyment, concentration, and effort to understand the material. These patterns are useful for contextual description but should not substitute for scale dispersion or psychometric reporting.

The communication measure is described as covering willingness to speak, reading comprehension, retelling, and written expression. Because these dimensions were combined into one outcome score and detailed dispersion indices are unavailable, the observed mean should be interpreted cautiously.

Table 1. Descriptive statistics of the study variables

Variable	Mean	Category*
Family environment (X_1)	2.79	
Learning motivation through MABA (X_2)	2.90	

** Note. Higher mean scores indicate more favorable levels of the respective constructs. Because the original study did not report standard deviations, minimum–maximum scores, or empirically validated classification thresholds, the descriptive means are presented without inferential interpretation of categorical labels.*

Assumption Testing

The reported Kolmogorov–Smirnov test for unstandardized residuals was $K-S = 0.166$, $p = .200$. Deviation-from-linearity tests were $p = .088$ for family environment and $p = .944$ for MABA-context motivation. These tests did not detect departures from normality or linearity at $\alpha = .05$, but with $n = 12$ the absence of statistical significance should not be treated as strong evidence that the assumptions are satisfied.

Tolerance was .999 and VIF was 1.001 for both predictors, providing no indication of multicollinearity in the fitted two-predictor model. Glejser test p values were .372 for family environment and .108 for MABA-context motivation, so the reported tests did not detect heteroscedasticity. Case-level residual and influence diagnostics are still required because significance-based tests have limited sensitivity in such a small sample.

Table 2. Regression assumption tests

Assumption	Statistic / p -value	Interpretation
Normality	$K-S = 0.166$; $p = .200$	No departure detected*
Linearity: X_1 –Y	Deviation $p = .088$	No deviation detected*
Linearity: X_2 –Y	Deviation $p = .944$	No deviation detected*
Multicollinearity: X_1	Tolerance = .999; VIF = 1.001	No indication
Multicollinearity: X_2	Tolerance = .999; VIF = 1.001	No indication
Heteroscedasticity: X_1	$p = .372$	Not detected*
Heteroscedasticity: X_2	$p = .108$	Not detected*

Note. Interpretation is provisional at $n = 12$. Data processed using SPSS, 2026.

Additional influence diagnostics were not available in the original analytical output. Accordingly, the reported assumption tests are interpreted cautiously, particularly because the small sample size limits the sensitivity and stability of formal diagnostic testing. No claim is therefore made that the regression assumptions were definitively satisfied.

Multiple Linear Regression

The exploratory two-predictor model was statistically significant, $F(2, 9) = 6.817$, $p = .016$. From the reported F statistic and degrees of freedom, the model corresponds to $R^2 = .602$ and adjusted $R^2 = .514$, indicating that approximately 60.2% of the observed variance in communication scores was accounted for within this sample. The corresponding observed f^2 is 1.51, which is nominally large as a sample effect but should not be interpreted as a stable population effect because $n = 12$ produces substantial risk of model optimism and coefficient instability. The standard error of estimate was not reported in the retained statistical output and therefore is not presented to avoid reconstructing an unsupported value.

$$Y = 5.807 + 0.170X_1 + 0.348X_2 + \varepsilon$$

Family environment had $B = 0.170$ (95% CI [0.021, 0.319]), $SE = 0.066$, and $\beta = .540$. MABA-context learning motivation had $B = 0.348$ (95% CI [0.063, 0.633]), $SE = 0.126$, and $\beta = .578$. The intercept was 5.807 (95% CI [−3.649, 15.263]). These intervals quantify the substantial uncertainty that accompanies the very small sample and are more informative than p values alone.

Table 3. Multiple linear regression coefficients

Predictor	B [95% CI]	SE	β	t	p
Constant	5.807 [-3.649, 15.263]	4.180		1.389	.198
Family environment (X_1)	0.170 [0.021, 0.319]	0.066	0.540	2.566	.030
Learning motivation through MABA (X_2)	0.348 [0.063, 0.633]	0.126	0.578	2.749	.023

Note. Dependent variable: Communication skills (Y). Source: Data processed using SPSS, 2026.

Regression and Hypothesis Tests

For H1, the family-environment coefficient was positive and statistically different from zero in this fitted sample ($B = 0.170$, 95% CI [0.021, 0.319], $\beta = .540$, $t = 2.566$, $p = .030$). This supports a positive partial association between family environment and communication skills conditional on the second predictor, but the estimate should be treated as exploratory rather than as a stable population effect.

For H2, MABA-context learning motivation was positively associated with communication skills ($B = 0.348$, 95% CI [0.063, 0.633], $\beta = .578$, $t = 2.749$, $p = .023$). Because the motivation measure may contain communication-adjacent indicators, this coefficient may partly reflect construct overlap and should not be interpreted as a pure motivational effect.

For H3, the additive two-predictor model was statistically significant, $F(2, 9) = 6.817$, $p = .016$, with $R^2 = .602$ and adjusted $R^2 = .514$. The result indicates that the two predictors jointly account for variation in communication skills in this sample; it does not establish a causal mechanism, statistical interaction, or predictive validity beyond the observed cohort.

Table 4. Summary of exploratory regression tests

Hypothesis	Statistical result	Decision
H1: Family environment $\rightarrow$ communication skills	$\beta = .540$; $t = 2.566$; $p = .030$	Supported
H2: Learning motivation through MABA $\rightarrow$ communication skills	$\beta = .578$; $t = 2.749$; $p = .023$	Supported
H3: $X_1 + X_2 \rightarrow$ communication skills	$F(2, 9) = 6.817$; $p = .016$; $R^2 = .602$; adj. $R^2 = .514$	Supported

Overall, both partial coefficients were positive and the two-predictor model was statistically significant in the observed cohort. Given $n = 12$, the small difference between standardized coefficients is not interpreted as evidence that one predictor is meaningfully more important than the other.

Discussion

The positive family-environment coefficient is consistent with the view that children's communication is embedded in routine language and literacy experiences across home and school. This interpretation is reinforced by contemporary evidence showing that shared reading, parent-child language interaction, literacy resources, and tied with children's oral-language and literacy development across different cultural and linguistic settings (Dong & Chow, 2022; Grolog, 2020; Lee & Moussa, 2024; Wirth et al., 2022). In a bioecological perspective, parent-child conversation, support for learning, and access to literacy activities can function as proximal processes that create repeated opportunities for children to interpret and express meaning (Bronfenbrenner & Morris, 2006). Recent research further suggests that the home literacy environment should not be treated as a single homogeneous construct because access to print, explicit literacy activities, parental expectations, parental literacy behavior, and digital literacy experiences may make distinct contributions to children's development (Esmaeeli, 2024; Li et al., 2024; Li et al., 2026; Yuan et al.,

2024). The present finding is therefore plausible as an association, but the small cross-sectional sample does not establish that the family environment caused better communication performance.

The broader evidence base also argues for nuance rather than a uniformly strong family effect. Sénéchal and LeFevre (2014) reported longitudinal links between home literacy practices and growth in vocabulary and reading, while the large LMIC meta-analysis by Nag et al. (2024) found a small overall association that depended strongly on which home practices and measures were used. In rural Java, Adam et al. (2025) found more direct relations from caregiver language and literacy skills than from the home literacy environment itself. Comparable recent studies demonstrate substantial heterogeneity in home-literacy profiles and indicate that children's literacy interest, family resources, caregiver roles, and sociocultural context can modify the strength or form of literacy-related associations (Bai et al., 2025; Sundqvist et al., 2024; von Suchodoletz et al., 2025; Zhang et al., 2024; Zhang et al., 2025). These studies support the relevance of family context while also showing why the coefficient observed in 12 students should not be generalized without replication.

A provisional practical implication is that schools may consider home-school literacy continuity such as encouraging discussion of reading materials at home as a potentially useful direction rather than as an intervention proven by this study. Evidence from systematic reviews and meta-analyses indicates that shared book reading, enriched access to books, and language-comprehension activities can support language and literacy outcomes, although effect sizes vary substantially across intervention type and implementation conditions (de Bondt et al., 2020; Dowdall et al., 2020; Silverman et al., 2020). The present data do not test which family practices are most effective, how frequently they should occur, or whether changing them would improve communication.

The positive coefficient for MABA-context motivation is also consistent with research showing that motivated young readers engage more frequently and productively with reading activities. Stutz et al. (2016) linked intrinsic reading involvement with reading amount and comprehension, and Schiefele et al. (2016) found reciprocal longitudinal relations between motivation and reading comprehension in early elementary grades. A large meta-analysis similarly identified a significant association between reading motivation and reading achievement across K–12 populations, while more recent studies have linked autonomous or intrinsic motivation with reading development, literacy achievement, and broader indicators of engagement (De Smedt et al., 2020; Ha & Roehrig, 2022; Toste et al., 2020; Vaknin-Nusbaum, 2023). These findings support an engagement-based interpretation, but they also warn against one-way causal language.

Reverse directionality is plausible in the present cross-sectional design. Students who already possess stronger communication or comprehension skills may find MABA-based activities easier or more enjoyable and may therefore report greater interest, concentration, and participation. Longitudinal evidence provides particular reason for caution: reading skill and reading enjoyment or motivation can show reciprocal or developmentally changing relations, and prior performance may sometimes predict subsequent motivation as strongly as, or more strongly than, motivation predicts later performance (Coventry et al., 2023; Miyamoto et al., 2020; Toste et al., 2020). Recent longitudinal evidence also suggests that intrinsic reading motivation can predict later language-domain achievement, but such findings depend on temporally ordered measurements rather than concurrent cross-sectional scores (Arens & Möller, 2025). The data cannot distinguish whether

motivation precedes communication performance, communication competence increases motivation, or both are shaped by a third factor such as prior achievement, teacher support, or language background. In particular, classroom autonomy support has itself been associated with trajectories of intrinsic reading motivation, illustrating how instructional context may contribute to motivational differences (Engler & Westphal, 2024).

A second alternative explanation concerns measurement endogeneity. The source motivation instrument appears to include active participation or willingness-to-communicate content, while the outcome includes expression of opinions and discussion participation. Such overlap can mechanically increase the observed association even when the underlying constructs are less strongly related. This issue is especially important because discriminant validity requires evidence that theoretically distinct constructs remain empirically distinguishable after measurement error is considered (Rönkkö & Cho, 2022). The preferred follow-up is an item-level sensitivity analysis using a motivation score restricted to non-communication indicators.

For the same reason, the MABA finding should not be interpreted as evidence that the magazine itself improved communication. MABA was an existing instructional medium, not a manipulated treatment. The current evidence only indicates that students who reported stronger motivational engagement in this MABA-supported context also tended to have higher communication scores.

The overall model accounted for 60.2% of observed variance (adjusted $R^2 = 51.4\%$) in this cohort. Although this appears substantial, two cautions dominate interpretation: the estimate is based on only nine residual degrees of freedom, and the fitted model may capitalize heavily on sample-specific variation. Statistical power and effect-size estimation in multiple regression are highly dependent on sample size, predictor correlations, and uncertainty in expected effects, making appropriately powered designs especially important for regression-based inference (Anderson, 2021). The result is best described as preliminary joint association evidence. Because no $X_1 \times X_2$ term was included, the model is additive and should not be described as demonstrating an “interaction” between family environment and motivation.

The integrated theoretical interpretation is therefore limited to complementary, not causal, mechanisms. Family context may provide opportunities for language use and literacy practice, whereas autonomously motivated engagement may increase persistence with reading and response activities (Bronfenbrenner & Morris, 2006; Ryan & Deci, 2020). Studies grounded in self-determination and engagement perspectives further indicate that students’ reading motivation is shaped by the quality of reading experiences and may operate together with cognitive and metacognitive engagement in supporting literacy performance (Jang et al., 2023; Tegmark et al., 2022). The present regression is compatible with this account but does not test the temporal pathway itself.

This bounded contribution differs from prior work in three ways: it focuses on a Grade 4 Indonesian-language context, combines a family variable with a learner-motivation variable in one exploratory model, and uses a broader communication outcome than reading comprehension alone. At the same time, the study cannot claim a validated explanatory model because its measurement and sample limitations are too substantial for that level of inference.

The print-based context remains pedagogically relevant but should be interpreted conservatively. MABA may provide concrete material around which students read, retell, discuss, and

write, yet the current design cannot determine whether print format, content quality, teacher facilitation, novelty, or students' pre-existing interest accounts for the observed motivation scores. This distinction is important because meta-analytic research comparing children's paper- and screen-based reading indicates that medium effects are contingent on design features and that print itself should not automatically be treated as the causal source of improved learning (Furenes et al., 2021). Similarly, recent evidence shows that traditional and digital literacy experiences coexist within children's home learning ecologies and may relate differently to language outcomes (Sundqvist et al., 2024; Yuan et al., 2024; Li et al., 2026).

Accordingly, practical implications are provisional. Teachers may consider pairing print-based reading with structured retelling, discussion, and written response, and schools may encourage related home discussion; however, these practices are proposed as directions for further evaluation, not as interventions demonstrated effective by the present study. Existing intervention syntheses provide a rationale for evaluating such approaches because dialogic book sharing, increased access to reading materials, and explicit language-comprehension support can facilitate language and literacy outcomes under appropriate implementation conditions (de Bondt et al., 2020; Dowdall et al., 2020; Silverman et al., 2020).

The study's contribution is therefore deliberately narrow: it offers an exploratory, context-specific association between family conditions, MABA-context motivation, and a broad communication score, while identifying measurement and design questions that must be resolved before stronger educational claims can be made.

Several limitations are central to interpretation. First, $n = 12$ yields low statistical power, wide uncertainty, and unstable coefficients that are highly sensitive to individual cases. Contemporary guidance for regression studies emphasizes the need for explicit sample-size and power planning rather than relying on apparently large coefficients obtained from very small samples (Anderson, 2021). Second, the single-school, single-class context sharply limits transferability. Third, cross-sectional ex-post facto data cannot establish causal direction. Fourth, possible overlap between motivation and communication indicators threatens discriminant validity, and questionnaire-based predictors may introduce self-report and common-method bias. Methodological research demonstrates that common-method variance can either inflate or distort observed associations under particular measurement conditions and that discriminant validity should be established explicitly rather than inferred from apparently distinct scale labels (Baumgartner et al., 2021; Rönkkö & Cho, 2022). Fifth, the reviewer files do not provide sufficient information about item counts, scale anchors, reliability, construct validity, scoring of the communication assessment, or inter-rater reliability. Finally, case-level residual and influence diagnostics were not available for the present editorial revision.

Future research should first strengthen measurement and design before adding model complexity. Predictor and outcome scales should be conceptually separated and validated in a larger, diverse sample; communication subdimensions should be tested for appropriate aggregation; and longitudinal or adequately powered quasi-experimental designs should examine temporal direction. Measurement models should explicitly evaluate discriminant validity before structural relations are interpreted (Rönkkö & Cho, 2022), while regression sample sizes should be planned from plausible effect sizes and uncertainty rather than extrapolated from the present small-sample coefficients (Anderson, 2021). Only after adequate power and psychometric validity are established should

mediation or moderation models be tested. Replication across multiple schools and regions, together with robust confidence intervals and influence diagnostics, is necessary before any broader claim about MABA-supported motivation or family environment can be made.

Conclusion

This study examined whether family environment and learning motivation measured within a MABA-supported Indonesian language learning context were associated with fourth-grade students' communication skills. The findings indicate that both family environment and MABA-context learning motivation were positively associated with communication performance, while the additive two-predictor model accounted for a substantial proportion of the observed variation within the studied cohort. These results address the three research questions by showing that family-related learning conditions and motivational engagement each displayed positive partial associations with communication skills and that, when considered jointly, they were statistically related to students' communication performance. Nevertheless, the findings should be interpreted as exploratory and context-specific rather than as evidence of causal relationships or population-level predictive validity. In particular, MABA should be understood as the instructional context in which motivation was measured, not as an experimentally tested intervention. The study therefore suggests that children's communication development may be meaningfully associated with both the opportunities for language and literacy interaction available within the family environment and their motivational engagement with classroom literacy activities.

Theoretically, the findings provide preliminary support for integrating a bioecological perspective with self-determination theory by illustrating how contextual resources within the home and learner-level motivational processes may operate as complementary correlates of communicative development. Practically, the results suggest that teachers and schools may consider strengthening home-school literacy continuity, encouraging constructive parent-child communication around reading, and designing engaging literacy activities that promote sustained attention, expression, retelling, and discussion. However, these implications must remain provisional because the study involved only 12 students from a single elementary-school classroom, employed a cross-sectional non-experimental design, relied partly on self-report questionnaires, and lacked complete psychometric evidence for several measures. Potential overlap between motivation and communication indicators further constrains the interpretation of construct-specific effects. Future research should therefore replicate the study with larger and more diverse samples, psychometrically validated and clearly differentiated measures, longitudinal or adequately powered quasi-experimental designs, and robust residual and influence diagnostics. Such research could also examine specific dimensions of family literacy and motivation separately and determine whether the observed associations remain stable across schools, regions, and different literacy-media contexts. By positioning family context and motivational engagement within a cautiously bounded explanatory framework, this study provides a useful empirical starting point for more rigorous investigation of communication development in elementary language education.

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