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The Relationship between Vocabulary Mastery and Speaking Fluency among Reflective and Impulsive Learners

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Abstract

Indonesian learners of English consistently score lower in speaking than in reading or writing, a pattern the 2025 EF English Proficiency Index confirms at the national level. This study examines why by testing the relationship between vocabulary mastery and speaking fluency, and by asking whether that relationship holds equally for learners who process information deliberately and learners who process it rapidly. 20 eleventh-grade students at a senior high school in Malang completed a 20-item vocabulary test, a two-minute monologue scored against a fluency rubric, and a cognitive style questionnaire that classified 13 students as reflective and 7 as impulsive. Pearson correlation established a very strong association between vocabulary mastery and speaking fluency across the full sample ($r = 0.947$, $p < 0.05$), with vocabulary accounting for roughly 90 percent of the variance in fluency scores. Fisher's r-to-z transformation then compared the two subgroups and found no significant difference between them ($Z = -0.280$ against a critical value of ± 1.96). Cognitive style did shape attainment, since impulsive learners scored higher on both vocabulary (70.00 against 59.23) and fluency (51.43 against 45.38), yet it left the conversion mechanism untouched. The finding separates two questions the literature has treated as one. Style governs how much lexical resource a learner accumulates. It does not govern how efficiently that resource becomes speech. Vocabulary instruction therefore requires no differentiation by cognitive style, because a word learned by a reflective student and a word learned by an impulsive student yield fluency at the same rate.

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INTRODUCTION

English speaking proficiency remains one of the most persistent weaknesses in Indonesian secondary education, and the pattern is documented rather than merely anecdotal (Habibi et al., 2024). The 2025 EF English Proficiency Index placed Indonesia 80th out of 123 countries with a score of 471, keeping the country within the low-proficiency band and behind most of its Asian neighbors (Qin & Baker, 2025; Rahmawati et al., 2025). The more diagnostic figure lies in the skill breakdown. Indonesia scored 447 in speaking, below both its reading score of 491 and its writing score of 479, which indicates that the deficit is not a general weakness in English but a specific failure at the point of oral production (Marstaller, 2025; Popoola et al., 2025; Weaver & Kieffer, 2022). *Indonesian learners*, in other words, appear to know more English than they can say. That asymmetry defines the problem this study addresses: the obstacle is not the absence of linguistic knowledge but the difficulty of converting stored knowledge into speech delivered in real time, under the temporal pressure that spontaneous conversation imposes and that written examinations never do.

Research on this conversion has clustered around two questions that have rarely been asked together. The first concerns vocabulary. Uchihara and Saito (2019) found that learners' productive vocabulary scores correlated significantly with L2 fluency, though not with

comprehensibility or accentedness, a result that isolates fluency as the dimension of speech most sensitive to lexical resource. Takizawa et al. (2025) have since refined this position, arguing that vocabulary assessed through recognition or recall captures declarative knowledge that is not immediately available for real-life language use, and that automatized vocabulary knowledge is the better predictor of spontaneous speech. The second question concerns cognitive style, and here the evidence is unsettled. Chen. (2021) reported that *reflective learners* outperform impulsive learners in oral accuracy while impulsive learners outperform *reflective learners* in oral fluency, yet other work in the same tradition has found that *reflective learners* significantly outperform impulsive learners in speaking proficiency overall. The field has not settled which direction the effect runs.

Two gaps follow from this. The first is the contradiction just described: the cognitive style literature cannot presently say whether reflectivity helps or hinders oral performance, and a body of work that yields opposite findings on the same question is not yet a foundation to build on. The second gap is structural and, in our view, explains the first. Prior studies have almost invariably compared cognitive style groups on their mean scores, asking which group performs better. This design can detect a difference in attainment but is constitutionally incapable of detecting whether cognitive style alters the underlying relationship between vocabulary and fluency, because a difference in means and a difference in correlation are different quantities and a test of one is not a test of the other. Consequently, no study has yet established whether the vocabulary-fluency mechanism itself operates differently in reflective and impulsive learners, or whether cognitive style merely shifts where learners sit along a mechanism that is common to both. Studies that compare only means cannot answer this, and studies that report only a pooled correlation cannot either.

This study accordingly pursues two objectives. The first is to determine the strength and direction of the relationship between vocabulary mastery and speaking fluency among eleventh-grade EFL learners. The second, and the one that carries the study's contribution, is to determine whether that relationship differs in strength between reflective and impulsive learners. The methodological move that permits the second objective is the comparison of correlation coefficients rather than group means, using Fisher's r-to-z transformation to test whether two coefficients drawn from independent samples differ significantly. The study therefore addresses two research questions. First, what is the relationship between vocabulary mastery and speaking fluency among eleventh-grade students? Second, does that relationship differ between reflective and impulsive learners? The first question situates the study within an established literature; the second takes it somewhere that literature has not been.

The central argument advanced here is that the field has been conflating two distinct questions under a single heading. Asking whether cognitive style affects speaking performance treats performance as one undifferentiated outcome, when it is in fact composed of at least two separable properties: the level of linguistic resource a learner has accumulated, and the efficiency with which that resource is converted into speech. Cognitive style may plausibly operate on either, on both, or on neither, and these are empirically distinguishable possibilities that require different statistical tests to separate. By testing the level question through group means and the mechanism question through a comparison of correlations, this study is positioned to return different answers to each, and thereby to specify not merely whether cognitive style matters for L2 speaking but at which point in the causal chain it exerts its influence. The method that operationalizes this distinction is set out in the following section.

RESEARCH METHOD

This study employed a quantitative correlational design with comparative analysis, conducted at SMA Almaarif Singosari, Malang, during the 2025/2026 academic year. A correlational approach was appropriate because the study sought to identify the strength and direction of an existing relationship among variables in their natural classroom setting rather than to manipulate or treat any variable experimentally (Šarabon et al., 2023; Zięba & Pilecka, 2024).

Vocabulary mastery was positioned as the independent variable (X), speaking fluency as the dependent variable (Y), and cognitive style as a grouping variable (Z) that partitioned participants into reflective and impulsive categories. The comparative dimension of the design is what distinguishes it from a conventional correlational study: rather than comparing group means, it compares the correlation coefficients obtained within each cognitive style group, which permits a direct test of whether cognitive style moderates the vocabulary-fluency relationship (Kirişci, 2023; Kossenas et al., 2025). The population comprised all twenty eleventh-grade students, and because the population was small, total sampling was applied, making the sample identical to the population (Parker et al., 2023; Waples & Feutry, 2022). This approach eliminates sampling error but restricts the generalizability of the findings, a limitation acknowledged in the conclusion (Plonsky, 2023). The conceptual model guiding the study is presented in Figure 1.

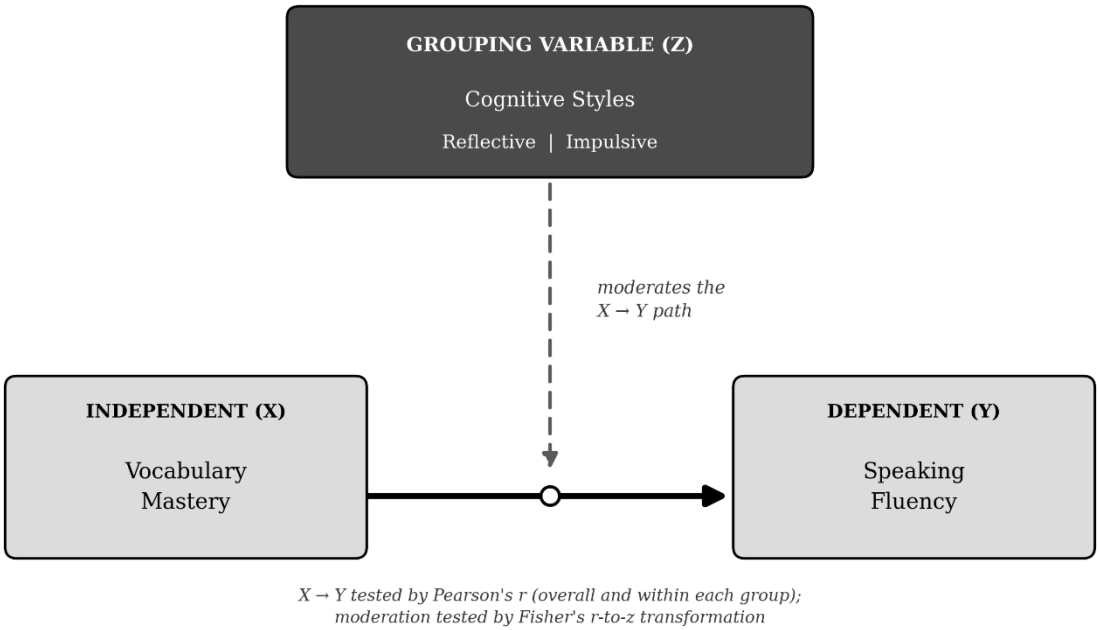

Figure 1. Research Conceptual Model
Source: Developed by the researcher (2025).

Figure 1 specifies the hypothesized structure the study was built to test. Vocabulary mastery is modeled as the input to speaking fluency, while cognitive style is positioned not as a third predictor but as a grouping variable acting on the X–Y path itself. This placement is consequential for the analysis: a moderator is tested by comparing the strength of a relationship across groups, not by comparing the groups' scores, which is why Fisher's r-to-z transformation rather than a t-test of means constitutes the decisive procedure in this design.

Data were collected through three instruments administered in a fixed sequence, since the cognitive style classification had to precede the two performance measures in order to establish the grouping variable. Students first completed a ten-item cognitive style questionnaire rated on a four-point Likert scale, in which the five impulsive items were reverse-scored using the formula (maximum scale value + 1) − original score, so that higher totals consistently indicated a stronger reflective orientation; the resulting range of 10 to 40 was divided at its midpoint, classifying scores of 26 to 40 as reflective and 10 to 25 as impulsive. Students then sat a twenty-item multiple-choice vocabulary test covering word meaning, form, and use, developed in alignment with the eleventh-grade English curriculum. Finally, each student delivered a two-minute monologue on the assigned topic "The Role of Social Media in My Life," following five minutes of preparation, and was scored through direct observation against a structured rubric. *Content validity* was established by aligning each instrument with its theoretical framework, and reliability was verified for both objective

instruments prior to analysis. The instruments and their psychometric properties are summarized in Table 1.

Table 1. Research Instruments and Reliability

Instrument	Variable	Description	Reliability
Cognitive Style Questionnaire	Cognitive style (Z)	Ten items, four-point Likert scale; five reflective and five impulsive items, the latter reverse-scored. Score range 10–40; reflective = 26–40, impulsive = 10–25	Cronbach's $\alpha = 0.72$
Vocabulary Test	Vocabulary mastery (X)	Twenty dichotomous multiple-choice items covering word meaning, form, and use; synonyms, antonyms, and context-based items. Score range 0–100	KR-20 = 0.76
Speaking Fluency Rubric	Speaking fluency (Y)	Two-minute monologue, five minutes' preparation. Three indicators: speech rate (10–40), hesitations and pauses (10–40), filled pauses (5–20). Maximum total 100	Single rater; standardized rubric applied uniformly

Source: Research instruments, compiled by the researcher (2025).

Table 1 shows that both objective instruments exceeded conventional reliability thresholds, with the questionnaire returning a Cronbach's Alpha of 0.72 and the vocabulary test a KR-20 coefficient of 0.76, indicating acceptable internal consistency for classroom-based measurement. Two methodological qualifications warrant explicit statement. First, the speaking assessment was conducted by a single rater, so inter-rater reliability could not be computed; consistency was pursued instead through uniform application of a standardized rubric across all twenty observations. Second, the cognitive style construct was operationalized through a self-report questionnaire rather than the Matching Familiar Figures Test used in Kagan's original formulation, which means the instrument captures students' dominant cognitive tendencies as they perceive them in classroom learning situations rather than their behavioral response latency under experimental conditions. These are limitations of measurement rather than of design, and they are carried forward into the interpretation of the findings.

Data analysis proceeded in three stages, each mapped to a specific inferential purpose. Descriptive statistics were computed first to establish the mean and dispersion of both performance variables, with the sample standard deviation calculated using the $N-1$ correction appropriate to a small sample. The Pearson Product-Moment Correlation was then applied to test the first hypothesis, examining the strength and direction of the relationship between vocabulary mastery and speaking fluency at a significance level of $\alpha = 0.05$; the analysis was run once for the full sample and separately within each cognitive style group, since an aggregate coefficient alone cannot exclude the possibility that a strong relationship in one subgroup is masking a weak one in the other. The second hypothesis required a comparison of the two subgroup coefficients, which cannot be performed by direct inspection because the sampling distribution of Pearson's r is skewed and increasingly so as coefficients approach unity. Fisher's r-to-z transformation was therefore applied to convert each coefficient into an approximately normally distributed z score, and the resulting Z observed was evaluated against the critical boundary of ± 1.96. All computations were performed using SPSS. The complete analytical sequence is set out in Table 2.

Table 2. Data Analysis Procedure

Stage	Technique	Purpose	Decision Criterion
1	Descriptive statistics (M, SD, range)	Establish the distribution of vocabulary mastery and speaking fluency scores	—
2	Pearson Product-Moment Correlation (r)	Test H_1: the relationship between vocabulary mastery and speaking fluency, computed overall and within each cognitive style group	t observed > t critical at $\alpha = 0.05$
3	Fisher's r-to-z	Test H_2: whether the two subgroup correlation	$\lvert Z \text{ observed} \rvert >$

Stage	Technique	Purpose	Decision Criterion
	transformation	coefficients differ significantly	1.96 at $\alpha = 0.05$

Source: Data analysis procedure developed by the researcher (2025).

Table 2 makes explicit the logic linking each analytical stage to the hypothesis it was designed to test. The distinction between stages two and three is the methodological core of this study. Stage two establishes whether a relationship exists and how strong it is within each group, but it cannot by itself determine whether the two groups differ, since two coefficients may appear numerically distinct while remaining statistically indistinguishable. Stage three supplies that determination, and it is the presence of this stage that allows the study to test moderation rather than merely to report two separate correlations side by side.

RESULT AND DISCUSSION

Results

Classification of Students' Cognitive Styles

The analysis began with the cognitive style questionnaire, since its outcome determined the grouping applied to every subsequent test. Each of the ten items was rated on a four-point scale, and the five impulsive items were reverse-scored so that a higher total consistently signaled a stronger reflective orientation. Total scores could range from 10 to 40, with scores of 26 to 40 classifying a student as a reflective learner and scores of 10 to 25 classifying a student as an impulsive learner. Applying these criteria to the 20 eleventh-grade participants produced two groups of unequal size, a consequence of the total sampling technique rather than of any selection decision made by the researcher. The distribution of participants across the two cognitive style categories is presented in Table 3.

Table 3. Classification of Students' Cognitive Styles

Cognitive Style	Frequency	Percentage
Reflective	13	65%
Impulsive	7	35%
Total	20	100%

Source: Cognitive style questionnaire processed by the researcher (2025).

Table 3 indicates a mean vocabulary score of 63.00, placing the cohort at a moderate level of lexical attainment, but the standard deviation of 18.17 exposes considerable variability behind that average. The seventy-point interval separating the highest score (95) from the lowest (25) means that the strongest and weakest students in a single classroom occupy almost opposite ends of the measurement scale. An average of 63.00 therefore describes no student in particular and conceals a cohort split between learners with a substantial working lexicon and learners whose vocabulary is severely constrained. This dispersion is analytically valuable rather than problematic, since it supplies precisely the variance in the predictor variable that the correlational analysis requires in order to detect a genuine relationship.

Disaggregating these scores by cognitive style produced a result that contradicts the expectation implied by the reflective-impulsive construct itself. *Reflective learners*, defined by their deliberate and accuracy-oriented processing, might reasonably be assumed to accumulate stronger declarative word knowledge than their faster-responding peers. The data collected here do not support that assumption, and the direction of the difference is the reverse of what the construct predicts. This descriptive divergence does not affect the correlational hypotheses being tested, but it establishes that the two groups did not enter the subsequent analysis from equivalent starting positions. The comparison of mean vocabulary scores between the reflective and impulsive groups is displayed in Figure 2.

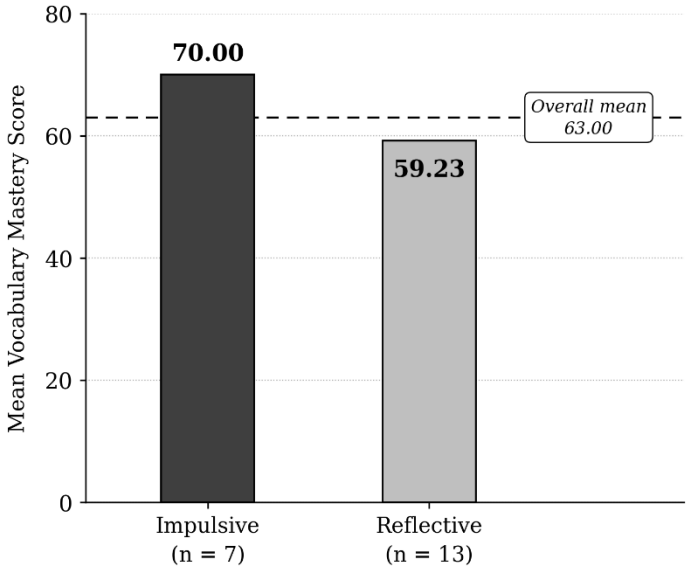

Figure 2. Mean Vocabulary Mastery Scores by Cognitive Style Group
Source: Vocabulary mastery test, processed by the researcher (2025).

Figure 2 shows that impulsive learners achieved a mean vocabulary score of 70.00 against 59.23 for *reflective learners*, a gap of 10.77 points favoring the group ordinarily characterized as less deliberate. The finding is counterintuitive on its face, since the reflective orientation is defined precisely by the careful, accuracy-seeking behavior one would expect to yield stronger word knowledge. Two cautions must accompany this observation. First, the difference in means was not submitted to significance testing, because the study was designed to compare correlation coefficients rather than group means. Second, the impulsive group numbers only seven students, so its mean is highly sensitive to individual scores. The gap is therefore reported as a descriptive characteristic of the sample rather than as a tested claim about cognitive style and vocabulary attainment.

Students' Speaking Fluency

The third instrument assessed speaking fluency through a two-minute monologue on the assigned topic "The Role of Social Media in My Life," with each performance observed and scored directly by the researcher. Scoring followed a structured rubric built on three indicators of fluent speech: speech rate, hesitations and pauses, and filled pauses. As with the vocabulary data, dispersion was computed using the sample standard deviation with the N−1 correction. The distribution that emerged differs from the vocabulary distribution in both level and spread, and the contrast between the two is itself informative about the gap separating what these students know from what they can produce in real time. The descriptive statistics for speaking fluency are presented in Table 4.

Table 4. Descriptive Statistics of Speaking Fluency Scores

Statistic	Overall	Reflective (n = 13)	Impulsive (n = 7)
Mean	47.50	45.38	51.43
Standard Deviation	11.30	11.41	10.80
Highest Score	68	62	68
Lowest Score	25	25	38
N	20	13	7

Source: Speaking fluency rubric, processed by the researcher (2025).

Table 4 reports a mean fluency score of 47.50 with a standard deviation of 11.30, placing the cohort well below the mean recorded for vocabulary mastery and within a distinctly narrower

band of variation. The most revealing figure is the ceiling: the strongest speaker in the cohort reached 68, whereas the strongest vocabulary score was 95, so even the most fluent student performed far below the level of lexical knowledge demonstrated at the top of the vocabulary distribution. This asymmetry indicates that no participant had fully converted their available word knowledge into automatized retrieval under the time pressure of spontaneous speech. The disaggregated figures reproduce the pattern already observed for vocabulary, with impulsive learners scoring higher on average (M = 51.43) than *reflective learners* (M = 45.38) while displaying almost identical internal variability (SD = 10.80 and SD = 11.41 respectively). The two groups therefore differ in level but not in spread, and the impulsive group now leads on both measured variables rather than on vocabulary alone.

The Correlation between Vocabulary Mastery and Speaking Fluency

The first research question was addressed using the Pearson Product-Moment Correlation, computed first across the full sample and then separately within each cognitive style group. Conducting the analysis at both levels serves a verification function, since an overall coefficient could in principle be inflated by a strong relationship in one subgroup masking a weak or absent relationship in the other, and only a within-group analysis can rule this out. Each obtained t-value was tested against the critical value corresponding to its own degrees of freedom at the 0.05 significance level. The coefficient of determination was also calculated for the overall sample to establish the proportion of shared variance between the two variables. The full correlational results are set out in Table 5.

Table 5. Pearson Correlation between Vocabulary Mastery and Speaking Fluency

Group	N	r	t-value	t-critical	df	Sig. (2-tailed)	Interpretation
Overall	20	0.947	12.534	2.101	18	0.000	Very strong positive
Reflective	13	0.942	9.316	2.201	11	0.000	Very strong positive
Impulsive	7	0.958	7.446	2.571	5	0.001	Very strong positive

Note. N = number of students;
r = Pearson correlation coefficient; df = degrees of freedom; significance tested at $p < 0.05$ (two-tailed).

Source: Vocabulary mastery test and speaking fluency rubric, processed by the researcher (2025).

Table 5 demonstrates that the relationship between vocabulary mastery and speaking fluency is very strong, positive, and statistically significant at every level of analysis. For the overall sample the coefficient reached r = 0.947, and the obtained t-value of 12.534 exceeds the critical value of 2.101 by a margin of nearly six times, so the null hypothesis is rejected decisively rather than marginally. The coefficient of determination ($r^2 = 0.897$) establishes that approximately ninety percent of the variance in speaking fluency is shared with vocabulary mastery, leaving barely ten percent for every other influence combined. Critically, the relationship does not depend on aggregation: it reappears at r = 0.942 among *reflective learners* and r = 0.958 among impulsive learners, both significant against their own critical thresholds. The association is thus a property of the sample throughout, not an artifact of pooling two dissimilar groups.

A correlation coefficient reports the strength of a linear association but conceals the distribution of the individual observations that produced it, and a high coefficient can in principle be generated by a small number of extreme cases rather than by a consistent pattern across the sample. To make the underlying distribution visible, each participant's vocabulary score was plotted against their speaking fluency score, with the two cognitive style groups distinguished by marker type and a fitted regression line superimposed. This visualization simultaneously displays the linearity of the association, the position of every participant relative to the trend, and the extent to which the reflective and impulsive learners occupy overlapping or separate regions of the score space. The individual score distribution and the fitted regression line are displayed in Figure 3.

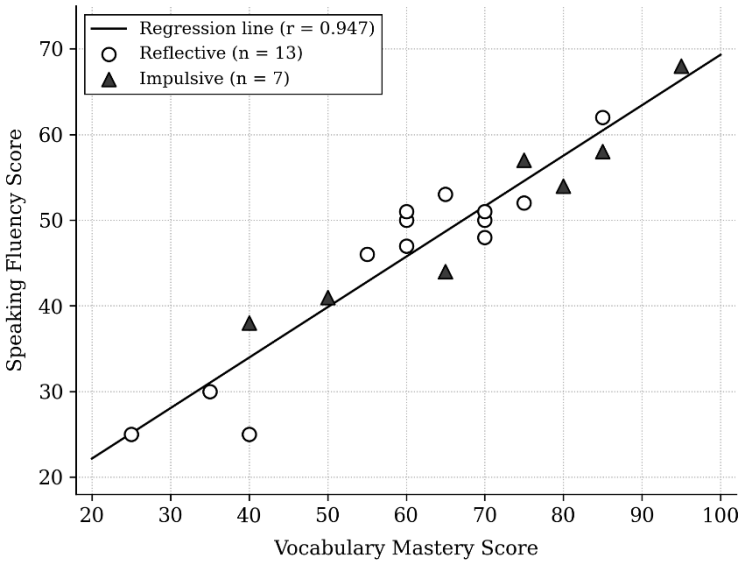

Figure 3. Scatterplot of Vocabulary Mastery against Speaking Fluency by Cognitive Style Group
Source: Vocabulary mastery test and speaking fluency rubric, processed by the researcher (2025).

Figure 3 shows that the twenty observations align closely along a single upward-sloping trend, with every participant positioned near the fitted regression line and no isolated case standing far enough from the trend to be driving the coefficient on its own. The linearity assumption underlying the Pearson analysis is therefore satisfied by inspection, and the strength of the association reported in Table 5 reflects a pattern distributed across the whole cohort rather than an artifact produced by a handful of extreme scores. Two features of the distribution merit particular attention. First, the reflective and impulsive markers are interleaved along the same regression line rather than forming two separate trends, which is the visual counterpart of the statistical finding that both subgroups yielded nearly identical coefficients. Second, the impulsive markers cluster disproportionately in the upper-right region of the plot, occupying the higher ranges of both variables simultaneously, whereas the reflective markers extend further into the lower-left region. This positioning explains the descriptive gaps displayed in Figure 1 and Table 4: the impulsive group did not follow a different rule linking vocabulary to fluency, but simply entered the analysis with higher scores on both measures.

Comparison of the Two Correlations across Cognitive Style Groups

The second research question asked whether the correlation observed among *reflective learners* differs significantly from the correlation observed among impulsive learners. The numerical gap between them (0.942 against 0.958) cannot be evaluated by inspection, because the sampling distribution of Pearson's r is skewed and becomes increasingly so as coefficients approach unity, which makes direct comparison across independent samples invalid. Fisher's r-to-z transformation was therefore applied to convert each coefficient into an approximately normally distributed z score, permitting a legitimate test of the difference. The reflective coefficient transformed to $z_1 = 1.756$ and the impulsive coefficient to $z_2 = 1.921$, and the resulting Z observed was then evaluated against the critical boundary of ± 1.96 at the 0.05 level. The comparison is presented in Table 6.

Table 6. Fisher's r-to-z Transformation Comparing the Reflective and Impulsive Groups

Parameter	Reflective	Impulsive
N	13	7
Pearson's r	0.942	0.958
Fisher's z	1.756	1.921

Parameter	Reflective	Impulsive
Z observed	−0.280	
Z critical (α = 0.05)	±1.96	
Decision	H_0 retained	
Results	Not significant	

Source: Fisher's r-to-z transformation of the correlation coefficients in Table 5, processed by the researcher (2025).

Table 6 shows a Z observed of −0.280 against a critical value of ±1.96, placing the obtained statistic deep inside the region of retention and leading to the retention of the null hypothesis. The distance from significance here is substantial rather than borderline: the obtained value reaches barely one-seventh of the threshold required, so this is not a difference that a modest increase in sample size would plausibly have rendered significant. Although the impulsive coefficient is numerically the larger of the two, the gap of 0.016 between them is negligible once the transformation has placed both on a comparable scale. Cognitive style, as operationalized in this study, therefore does not moderate the relationship between vocabulary mastery and speaking fluency. Vocabulary knowledge predicts fluent speech with equal force among learners who process deliberately and learners who process rapidly.

Read as a whole, the analyzes converge on a coherent picture with one genuine surprise embedded in it. Cognitive style did differentiate these students in a way the study did not predict, since the impulsive group commanded a markedly higher average vocabulary and a higher average fluency than the reflective group. What cognitive style did not do was alter the mechanism linking vocabulary to fluency, which operated at virtually identical strength in both groups and was confirmed as statistically indistinguishable rather than merely assumed to be so from the proximity of the two coefficients. The finding that survives across every level of this analysis is the robustness of the vocabulary-fluency association itself, which held at $r \geq 0.94$ in the full sample and in each subgroup independently, and which Figure 3 confirms to be distributed evenly across the cohort rather than concentrated in a subset of it.

Discussion

The Primacy of Vocabulary in Fluent Speech Production

The first finding of this study is the sheer magnitude of the association between vocabulary mastery and speaking fluency, which reached $r = 0.947$ across the full sample and accounted for approximately ninety percent of the shared variance between the two constructs. A coefficient of this size does not merely confirm that vocabulary matters; it suggests that within this cohort, lexical resource functions less as one contributing factor among many and more as the binding constraint on what a learner can produce in real time. This is consistent with (Du et al., 2023; Kent, 2024) speech production model, in which the formulation stage depends on the speaker's ability to retrieve lexical items rapidly enough to keep pace with an already-formed conceptual message. A speaker whose lexicon is thin does not simply speak with fewer words; they stall, because the formulator has nothing to work with. The account of fluency as a function of automatized lexical access provided by (Beard & De Giacomo, 2025; Wojnar et al., 2024) points in the same direction, and the insistence by (To et al., 2022) that vocabulary carries the primary burden of meaning is empirically vindicated here in a way that is unusually stark for classroom data.

The Asymmetry between Knowing and Producing

A second observation deserves attention even though it was not among the study's stated questions. The cohort scored a mean of 63.00 on vocabulary but only 47.50 on fluency, and the highest fluency score (68) fell well below the highest vocabulary score (95). No participant, in other words, was able to deploy in speech the full extent of the lexicon they demonstrated on a written recognition test. This asymmetry is precisely what the distinction between vocabulary breadth and automatized vocabulary knowledge predicts. (Lipner et al., 2021; Wang & Zhang, 2025) argue that breadth alone is insufficient for fluent (Naranjo et al., 2023; Rohollahzadeh Ebadi, 2025) locate

the decisive variable in the efficiency of lexical retrieval rather than in the size of the store. The present data show both propositions operating simultaneously: vocabulary size predicts fluency very strongly, yet the absolute level of fluency lags behind the absolute level of vocabulary knowledge across every participant. Knowing a word and being able to reach for it under time pressure remain distinguishable achievements.

A Finding That Runs against the Cognitive Style Literature

The most unexpected result of this study is that impulsive learners outperformed *reflective learners* on both measured variables, achieving a higher mean vocabulary score (70.00 against 59.23) and a higher mean fluency score (51.43 against 45.38). This runs counter to the expectation, (Chen, 2021; Glomb et al., 2025; Yasir* & Dwiyanti, 2023) whose reflective-impulsive construct associates the reflective disposition with careful, accuracy-oriented processing of exactly the kind a vocabulary test rewards, and it stands in tension (Hwang, 2025; Moiinvaziri, 2024; Wolfaardt & Leung, 2025), who reported that *reflective learners* achieved higher accuracy in spoken English while impulsive learners performed better on fluency. The present study reproduces neither half of that pattern cleanly, since the impulsive group here led on both dimensions rather than trading accuracy for speed. Two explanations merit consideration. The first is instrumental: a self-report questionnaire measures a learner's perception of their own processing tempo, which is not the same construct as the behavioral latency captured by Kagan's original Matching Familiar Figures Test, and confident high-proficiency students may well report themselves as fast responders precisely because their proficiency permits speed. The second is contextual: with only seven students in the impulsive group, the mean is highly sensitive to individual variation, and the difference was never submitted to significance testing because the study was designed to compare correlations rather than means. The finding is therefore reported as a genuine feature of this sample, not as a refutation of the prior literature.

Cognitive Style Does Not Moderate the Vocabulary-Fluency Link

The second research question yielded a null result of considerable interpretive value. Fisher's transformation placed the two subgroup coefficients at $Z = -0.280$ against a critical value of ± 1.96, a value so far inside the retention region that the difference between $r = 0.942$ and $r = 0.958$ cannot plausibly be attributed to anything but sampling noise. This is not a borderline null that a larger sample would likely overturn. The theoretical expectation, drawn from the trade-off logic that (Altınsoy et al., 2024; Estaji & Safari, 2023) applies to limited attentional resources, was that reflective and impulsive learners would allocate those resources differently and therefore convert lexical knowledge into fluent speech at different rates. They did not. Whatever differentiates a reflective from an impulsive learner in this cohort, it operates upstream of the conversion process rather than within it (Al-Qahtani & Al-Otaibi, 2025). The regression line in Figure 2 makes the point visually: the two groups do not form separate trends but interleave along a single line, with the impulsive markers simply positioned further along it.

Read together, the third and fourth findings resolve into a distinction that the cognitive style literature has tended to leave implicit. Cognitive style did something in this study, and it also failed to do something, and the two facts are not in conflict once the constructs are properly separated. Style shaped *how much* lexical resource a learner brought to the task, differentiating the two groups by nearly 11 points on vocabulary and six on fluency. Style did not shape *how efficiently* that resource was converted into speech, a mechanism that ran at effectively identical strength in both groups. Prior work has typically asked whether cognitive style affects language performance, treating performance as a single undifferentiated outcome, and has therefore been unable to distinguish an effect on the stock of knowledge from an effect on the process of deploying it. The present study, by comparing correlation coefficients rather than only group means, is able to answer the two questions separately and to return different answers to each. This dual-pathway structure is presented in Figure 4.

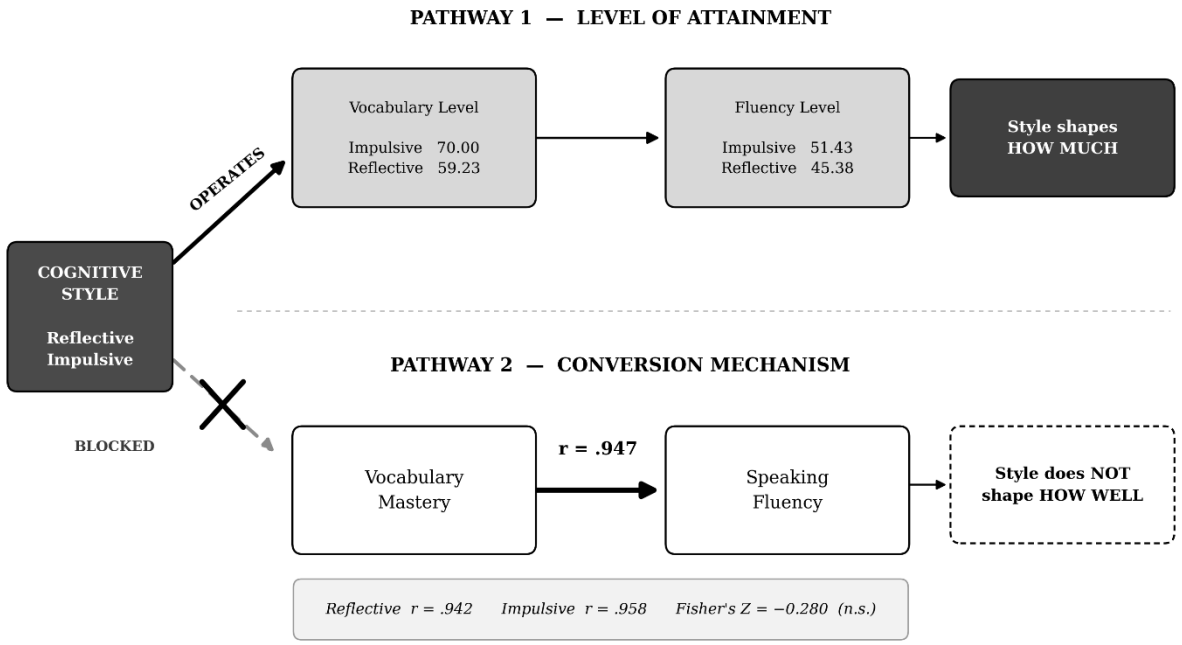

Figure 4. Dual-Pathway Model of Cognitive Style in the Vocabulary-Fluency Relationship
Source: Synthesis of findings, developed by the researcher (2025).

Figure 4 formalizes the study's central claim. Along the upper pathway, cognitive style operates: it is associated with measurable differences in the level of vocabulary and fluency a learner attains. Along the lower pathway, cognitive style is blocked: the mechanism converting vocabulary into fluent speech runs at r = .947 overall and remains statistically invariant across the two style groups. The model therefore reframes the question that the field has been asking. The productive question is not whether cognitive style influences second language speaking, since the answer is evidently yes at the level of attainment, but rather at which point in the causal chain it exerts that influence, since the answer is evidently not at the point of conversion.

The contribution of this study is best stated as a conceptual separation rather than as a new correlation. By demonstrating that cognitive style can differentiate learners' attainment levels while leaving the underlying vocabulary-fluency mechanism statistically untouched, the study supplies a distinction that both research design and classroom practice can act upon. For research, it implies that studies reporting an effect of cognitive style on speaking performance should specify whether that effect operates on the stock of knowledge or on its deployment, since a design that compares only group means cannot tell the two apart and a design that compares only correlations cannot detect the former. For teaching, the implication is more direct and, in a sense, more liberating. The invariance of the conversion mechanism means that vocabulary instruction does not require differentiation by cognitive style, because a word learned by a reflective student and a word learned by an impulsive student are converted into fluent speech with equal efficiency. Differentiation, where it is warranted, belongs at the level of how learners are brought to acquire vocabulary in the first place, not at the level of how they are taught to use it. In a classroom where roughly 90% of the variance in speaking fluency traces back to lexical resource, the highest-leverage intervention for every learner, regardless of processing tempo, is the same: expand the lexicon and automatize access to it.

CONCLUSION

This study established a very strong, positive, and statistically significant relationship between vocabulary mastery and speaking fluency among eleventh-grade students (r = 0.947, p <

0.05), and Fisher's r-to-z transformation confirmed that this relationship did not differ significantly between reflective (r = 0.942) and impulsive (r = 0.958) learners (Z = −0.280, Z critical = ±1.96). Several limitations qualify these conclusions. The sample was small and drawn from a single classroom, and the impulsive subgroup comprised only seven students, which constrained the statistical power of the comparison and left the descriptive gap in group means untested. Cognitive style was measured through a self-report questionnaire rather than a behavioral latency task, so what was captured may be learners' perception of their processing tempo rather than the tempo itself. The speaking task, a two-minute monologue on a familiar topic, may also have been insufficiently demanding to expose stylistic variation. Future research should therefore employ larger and more balanced samples, behavioral measures of cognitive tempo, and more cognitively demanding speaking tasks such as impromptu debate or narrative retelling.

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