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**Pensar en inglés y toma de decisiones en estudiantes de bachillerato:  
revisión sistemática de la evidencia**

***Thinking in english and decision making among high school students: a  
systematic review of the evidence***

**Autores:**

Denny Jineth Jara Arias

Unidad Educativa Nueve de Octubre, Machala, Ecuador

[denny.jara@docentes.educacion.edu.ec](mailto:denny.jara@docentes.educacion.edu.ec)

<https://orcid.org/0009-0005-7733-8127>

Yesenia Margarita Cruz Macas

Unidad Educativa Nueve de Octubre, Machala, Ecuador

[jeseniacruz1215@gmail.com](mailto:jeseniacruz1215@gmail.com)

<https://orcid.org/0009-0002-9160-8937>

Margarita Mariuxi González Sarmiento

Unidad Educativa Nueve de Octubre, Machala, Ecuador

[margarita.gonzalez@docentes.educacion.edu.ec](mailto:margarita.gonzalez@docentes.educacion.edu.ec)

<https://orcid.org/0009-0002-0343-4800>

Jimmy Jovanny Gonzalez Carrasco

Unidad Educativa Nueve de Octubre, Machala, Ecuador

[jimmygonzalez3@hotmail.com](mailto:jimmygonzalez3@hotmail.com)

[https://o](https://orcid.org/0009-0001-5462-3911)

Mercedes Lisseth Luna Reascos

Unidad Educativa Avenir, Machala, Ecuador

[missmoon6596@gmail.com](mailto:missmoon6596@gmail.com)

<https://orcid.org/0009-0001-5462-3911>

**Autor de correspondencia:** Denny Jineth Jara Arias, [denny.jara@docentes.educacion.edu.ec](mailto:denny.jara@docentes.educacion.edu.ec)

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### RESUMEN

**Objetivo:** Analizar la evidencia disponible sobre la relación entre pensar en inglés y la toma de decisiones en estudiantes de bachillerato. **Metodología:** Se realizó una revisión sistemática cualitativa de la literatura siguiendo las directrices PRISMA 2020. Se incluyeron 15 estudios científicos publicados entre 2020 y 2026, seleccionados mediante criterios de inclusión y exclusión previamente establecidos. La evidencia se organizó en cuatro categorías: procesamiento en lengua extranjera y esfuerzo cognitivo; pensamiento crítico en la enseñanza del inglés como lengua extranjera; toma de decisiones y cognición adolescente; y contexto educativo y estrategias de enseñanza. **Resultados:** Los estudios revisados muestran que el procesamiento en una lengua extranjera puede relacionarse con cambios en el razonamiento, la percepción del riesgo, el juicio moral y la evaluación de alternativas. También se observó que el aprendizaje del inglés puede favorecer habilidades de análisis, inferencia, evaluación de argumentos, reflexión y valoración de fuentes cuando las actividades promueven pensamiento de orden superior. Sin embargo, los efectos varían según la competencia lingüística, la carga cognitiva, la dificultad de la tarea, la edad y el contexto educativo. **Conclusión:** La relación entre pensar en inglés y la toma de decisiones es compleja y multidimensional; por ello, su aprovechamiento educativo requiere estrategias ajustadas al nivel lingüístico y a las características de los estudiantes.

**Palabras clave:** inglés como lengua extranjera; toma de decisiones; pensamiento crítico; bachillerato; efecto de lengua extranjera.

### ABSTRACT

**Objective:** To analyze the available evidence on the relationship between thinking in English and decision-making among high school students. **Methodology:** A qualitative systematic literature review was conducted following the PRISMA 2020 guidelines. Fifteen scientific studies published between 2020 and 2026 were included according to previously established inclusion and exclusion criteria. The evidence was organized into four categories: foreign-language processing and cognitive effort; critical thinking in English as a Foreign Language education; decision-making and adolescent cognition; and educational context and teaching strategies. **Results:** The reviewed studies show that processing information in a foreign language may be associated with changes in reasoning, risk perception, moral judgment, and the evaluation of alternatives. English-language learning may also support analysis, inference, argument evaluation, reflection, and source evaluation when activities promote higher-order thinking. However, the effects vary according to language proficiency, cognitive load, task difficulty, age, and educational context. **Conclusion:** The relationship between thinking in English and decision-making is complex and multidimensional; therefore, its educational use requires strategies adapted to students' language proficiency and individual characteristics.

**Keywords:** English as a foreign language; decision-making; critical thinking; high school students; foreign language effect.



## 1. INTRODUCTION

The use of English as a foreign language is increasingly associated not only with communication but also with cognitive processes such as reasoning, critical thinking, and decision-making. In educational contexts, students are frequently required to analyze information, compare alternatives, solve problems, and justify opinions while using English. Research on the *foreign language effect* suggests that people may process information differently when using a non-native language. Miozzo et al. (2020) found that language context can influence decision-making and moral judgment, while McFarlane et al. (2020) explain that thinking in another language may alter reasoning processes depending on the task and the learner's characteristics.

However, using English does not necessarily improve decision-making in every situation. Białek et al. (2020) found that reasoning in a foreign language can increase cognitive effort and, in some cases, reduce accuracy, especially when individuals must resolve conflicts between intuitive beliefs and logical information. In contrast, Cinci et al. (2021), through a meta-analysis, reported that foreign-language use can influence moral judgments and risk-related decisions. Similarly, Del Maschio et al. (2022) confirmed that decision-making can vary according to the language in which information is processed.

These findings are particularly relevant during adolescence, a stage in which students increasingly make academic, social, personal, and future-oriented decisions. At this stage, learners develop greater autonomy and are expected to evaluate consequences, regulate emotions, solve problems, and select among different alternatives. Icenogle and Cauffman (2021) emphasize that adolescent decision-making is influenced by cognitive, emotional, developmental, and contextual factors. Therefore, the language in which students process information may represent an additional factor when examining how they reason and make decisions.

In English as a Foreign Language education, critical thinking has also become an important educational objective. English learning can offer opportunities for students to interpret information, question assumptions, evaluate arguments, compare viewpoints, and justify conclusions. Yuan et al. (2022), in a systematic review, found that teachers recognize the



importance of integrating critical thinking into EFL instruction, although effective implementation requires appropriate pedagogical strategies and teacher preparation.

The connection between English and critical thinking can also be examined through specific cognitive skills. Hirai et al. (2022) developed and validated an English Critical Thinking Test designed to measure abilities such as analysis, inference, and consistency among EFL learners. These processes are closely related to decision-making because students must interpret information, identify relevant evidence, draw conclusions, and maintain coherent reasoning before choosing among alternatives.

Nevertheless, critical thinking does not develop automatically simply because students learn English. Classroom interaction, questioning, discussion, feedback, and instructional design are important in determining whether students actually engage in higher-order thinking. Li (2023) highlights that teachers' conceptions and classroom practices strongly influence how critical thinking is developed in EFL contexts. Therefore, the cognitive benefits of English learning depend partly on the way language is used within meaningful and reflective learning experiences.

More recent studies provide further support for this relationship. Li and Liu (2024) identified seven dimensions of critical thinking in EFL learners, including analysis, inference, argument evaluation, language construction, self-reflection and correction, cultural comparison, and evaluation of source credibility. These dimensions are also relevant to decision-making because they help students examine alternatives, reconsider initial judgments, and evaluate the reliability of information before making a final choice.

The high school context is especially important because students are progressively expected to demonstrate greater independence in learning and decision-making. Fernandes et al. (2024) showed that English classes at the secondary level can provide opportunities for the development of critical-thinking processes through listening and speaking activities. Likewise, Raslan and Forawi (2024) emphasized that high school education should move beyond teaching students what to think and instead strengthen how they think, especially when analyzing information and solving problems.

In addition, structured English-learning experiences may strengthen reflective and analytical thinking. Liu and Wang (2024) found that organized learning activities in English literature classes supported critical-thinking development among EFL learners. Although the



educational context of their study differs from high school education, the findings suggest that English instruction can support cognitive development when learners are encouraged to question, analyze, compare, and justify ideas.

Recent research also indicates that the foreign-language effect is not identical for all learners. Purpuri et al. (2025) explain that differences in language proficiency, age, personality, task characteristics, and emotional involvement may affect how a foreign language influences judgment and decision-making. This suggests that thinking in English should not be considered automatically advantageous or disadvantageous; instead, its effects may vary according to the learner and the situation in which a decision is made.

Furthermore, instructional materials may play an important role in promoting higher-order thinking. Li et al. (2026) found that the use of discipline-specific and recent academic materials in English courses contributed to the development of critical-thinking dispositions. Their findings reinforce the idea that English can become a context for cognitive development when learning materials encourage students to analyze information, compare perspectives, and engage with meaningful content.

Overall, recent research indicates that thinking in English may influence decision-making by modifying the way students process information, evaluate alternatives, interpret risks, regulate emotional responses, and construct judgments. Nevertheless, this influence is not always positive or identical for all learners because it may depend on language proficiency, cognitive load, task complexity, educational experience, and the characteristics of the decision itself.

For this reason, studying the relationship between thinking in English and decision-making among high school students can contribute to understanding how foreign-language learning interacts with cognitive development during adolescence. It may also provide useful information for designing English-learning activities that go beyond memorization and promote reflection, reasoning, problem solving, and evaluation of alternatives.

Therefore, this article aims to analyze the available evidence on the relationship between thinking in English and decision-making among high school students, considering processes such as reasoning, critical thinking, evaluation of alternatives, risk assessment, emotional response, and problem solving. The study is guided by the following research question: What



does the available evidence suggest about the relationship between thinking in English and decision-making among high school students?

## 2. METHODOLOGY

### a) Study approach

The present research was developed under a qualitative approach through a systematic literature review. The objective of the review was to analyze the available evidence on the relationship between thinking in English and decision-making among high school students, considering cognitive processes such as reasoning, critical thinking, evaluation of alternatives, risk assessment, emotional response, and problem solving.

This approach made it possible to identify, organize, compare, and synthesize scientific evidence related to foreign-language processing, the foreign language effect, critical thinking, decision-making, cognitive effort, adolescent development, English as a Foreign Language (EFL), and educational strategies that promote higher-order thinking.

A systematic literature review constitutes a structured methodological process that allows researchers to collect, evaluate, and synthesize existing studies through transparent procedures of identification, selection, and analysis. Sauer and Seuring (2023) indicate that systematic reviews require a clearly defined research question, transparent search procedures, explicit study-selection criteria, and a structured synthesis of the available evidence.

### b) Method

A systematic literature review method was applied, using the guidelines established by PRISMA 2020 (*Preferred Reporting Items for Systematic Reviews and Meta-Analyses*) as the methodological framework for documenting the identification, screening, eligibility, and inclusion of scientific studies.

According to Page et al. (2021), PRISMA 2020 provides an updated framework for improving transparency in systematic reviews by clearly reporting how records were identified, screened, evaluated, excluded, and finally included.

The selection process was represented through a PRISMA 2020 flow diagram detailing the records initially identified, removal of duplicates, screening of titles and abstracts, full-text eligibility assessment, reasons for exclusion, and the studies finally included in the review.

### c) Search strategy



The bibliographic search was conducted on September 18, 2026, in Scopus; September 18, 2026, in Web of Science; September 19, 2026, in SciELO; September 19, 2026, in Redalyc; September 20, 2026, in Dialnet; and September 20, 2026, in Google Scholar. The search covered publications from 2020 to 2026. Filters were applied separately according to the technical options available in each database and search platform.

**Table 1.**

*Search strategies according to database*

| Database       | Search equation                                                                                                                                                                                                                           | Fields searched                  | Search date        | Filters applied                                                                                                                                                |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Scopus         | TITLE-ABS-KEY(("foreign language effect" OR "thinking in English" OR "foreign language processing") AND ("decision-making" OR "reasoning" OR "critical thinking") AND ("high school students" OR "adolescents" OR "secondary education")) | Title, abstract, keywords        | September 18, 2026 | Publication years: 2020–2026; document type: article; languages: English and Spanish; subject areas related to Social Sciences, Psychology, and Education      |
| Web of Science | TS(("foreign language" OR "thinking in English" OR "foreign language effect") AND ("decision making" OR "critical thinking" OR "reasoning") AND ("adolescents" OR "high school" OR "secondary education"))                                | Topic, title, abstract, keywords | September 18, 2026 | Publication years: 2020–2026; document type: article; languages: English and Spanish; research areas related to Education, Psychology, and Linguistics         |
| SciELO         | ("lengua extranjera" OR "inglés") AND ("toma de decisiones" OR "pensamiento crítico" OR "razonamiento") AND ("adolescentes" OR "bachillerato" OR "educación secundaria")                                                                  | All available fields             | September 19, 2026 | Publication years: 2020–2026; document type: research article; languages: Spanish and English; subject areas related to Education, Psychology, and Linguistics |
| Redalyc        | ("inglés como lengua extranjera" OR "lengua extranjera") AND ("pensamiento crítico" OR "toma de                                                                                                                                           | Title, abstract, keywords        | September 19, 2026 | Publication years: 2020–2026; discipline: Education and Psychology; document                                                                                   |



| Database       | Search equation                                                                                                                                                  | Fields searched                    | Search date        | Filters applied                                                                                                                        |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Dialnet        | decisiones") AND ("bachillerato" OR "educación secundaria")                                                                                                      |                                    |                    | type: scientific article;<br>languages: Spanish and English<br><br>Publication years: 2020–                                            |
|                | ("inglés" AND "pensamiento crítico") OR ("lengua extranjera" AND "toma de decisiones") OR ("inglés" AND "razonamiento")                                          | Title, abstract, indexed documents | September 20, 2026 | 2026; document type: journal article; subjects related to Education, Psychology, and Language Teaching; languages: Spanish and English |
| Google Scholar | ("foreign language effect" OR "thinking in English") AND ("decision-making" OR "critical thinking" OR "reasoning") AND ("high school students" OR "adolescents") | Title, abstract, available text    | September 20, 2026 | Custom date range: 2020–2026; patents excluded; citations excluded when possible; results in English and Spanish                       |

**Note.** The search equations were adapted according to the technical characteristics of each platform while maintaining conceptual equivalence among the descriptors.

For Google Scholar, the first 100 results ranked by relevance were screened. Titles and available abstracts were reviewed, and 20 records that met the predefined eligibility criteria were selected for inclusion in the initial screening database. Screening was discontinued after the first 100 results because subsequent records showed increasing duplication and decreasing relevance to the research question.

**d) Identification of records**

The initial search identified records related to the research problem. The retrieved publications were organized in a bibliographic matrix considering:

- Author.
- Year of publication.
- Country.
- Objective.
- Methodology.



- Population.
- Educational context.
- Main variable.
- Main findings.
- Contribution to the relationship between English-language thinking and decision-making.

Duplicate documents were identified through comparison of title, authors, year, scientific journal, and DOI.

A total of 82 records were initially identified:

- Scopus: n = 17.
- Web of Science: n = 15.
- SciELO: n = 12.
- Redalyc: n = 10.
- Dialnet: n = 8.
- Google Scholar: n = 20.

After the removal of 12 duplicate records, 70 documents remained for screening.

#### **e) Selection and evaluation of studies**

The selection process was carried out in three stages.

##### **Initial screening**

A total of 70 titles and abstracts were reviewed. During this stage, 38 records were excluded.

The reasons for exclusion were:

- Did not directly address foreign-language thinking or English processing (n = 11).
- Did not analyze decision-making, reasoning, or critical thinking (n = 9).
- Were developed outside an educational context (n = 7).
- Focused exclusively on populations unrelated to adolescents or students (n = 6).
- Did not analyze cognitive or educational variables relevant to the study (n = 5).

After screening, 32 full-text articles remained.

##### **Eligibility assessment**

The 32 articles were reviewed in full text to evaluate their relevance to the research objective.

A total of 17 full-text articles were excluded for the following reasons:

- Insufficient methodological information (n = 5).



- The population did not correspond to the educational purpose of the review (n = 4).
- Did not directly examine foreign-language processing or English-related cognition (n = 4).
- Results were not clearly related to decision-making or critical thinking (n = 2).

Additional duplicate publications identified during full-text assessment (n = 2).

Although duplicate records had been removed before the screening stage, two additional duplicate publications were identified during full-text assessment because their duplication was not evident from the initial bibliographic metadata. These records were therefore excluded at the eligibility stage.

Final inclusion

A total of 15 scientific studies met the eligibility criteria and formed the final documentary sample.

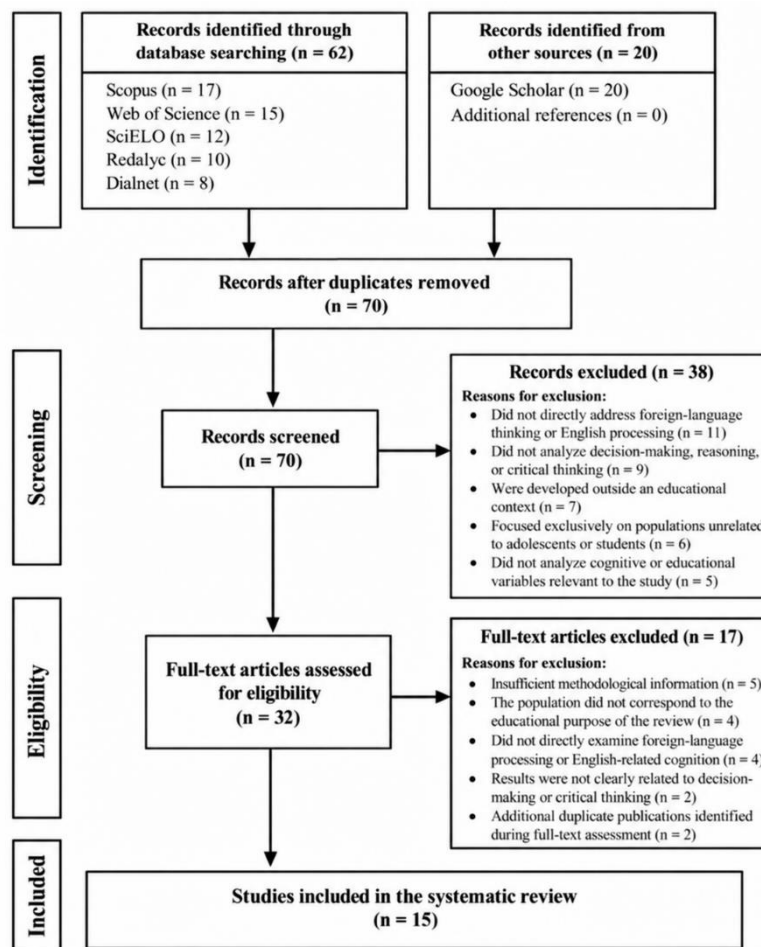
The screening and study-selection process was conducted by one reviewer. The same reviewer independently screened titles and abstracts assessed the full texts for eligibility, and determined the final inclusion of studies according to the predefined inclusion and exclusion criteria.

#### **f) PRISMA 2020 flow diagram**

#### **Figure 1.**

*Study selection process according to PRISMA 2020*





**Note.** The diagram represents the identification, screening, eligibility, and inclusion phases according to the recommendations proposed by Page et al. (2021).

### g) Inclusion and exclusion criteria

Inclusion criteria

The following criteria were established:

- Scientific articles published between 2020 and 2026.
- Peer-reviewed studies.
- Publications written in English or Spanish.
- Research related to the foreign language effect.
- Studies addressing foreign-language processing.
- Studies related to decision-making, reasoning, or critical thinking.
- Research involving EFL learning.



- Studies involving adolescents, high school students, or secondary-education populations, as well as complementary studies conducted with university students, adults, bilingual speakers, or other EFL populations when their findings provided relevant evidence on foreign-language processing, reasoning, critical thinking, decision-making, cognitive effort, or related cognitive mechanisms applicable to the research question.
- Documents with sufficient methodological information.
- Studies whose findings contributed directly or complementarily to the research objective.

#### Exclusion criteria

The following were excluded:

- Duplicate publications.
- Theses and unpublished works.
- Opinion articles and editorials.
- Publications prior to 2020.
- Studies unrelated to foreign-language cognition.
- Studies unrelated to decision-making, critical thinking, or reasoning.
- Documents without sufficient methodological description.
- Studies whose results could not be connected to the research question.

#### **h) Sources and documentary sample**

The sources used were Scopus, Web of Science, SciELO, Redalyc, Dialnet, and Google Scholar.

After applying the identification, screening, and eligibility procedures, the final documentary sample consisted of 15 scientific publications published between 2020 and 2026.

Direct evidence was considered to include studies involving high school students, adolescents, or secondary education. Complementary evidence included studies with university students, adults, bilingual speakers, or general EFL learners when their findings were relevant to foreign-language cognition, reasoning, decision-making, or critical thinking. For analytical purposes, the included studies were classified as direct or complementary evidence. Direct evidence referred to studies conducted specifically with high school students, adolescents in secondary education, or populations directly corresponding



to the target group of the review. Complementary evidence referred to studies involving university students, adults, bilingual speakers, or broader EFL populations whose findings contributed to explaining cognitive mechanisms related to foreign-language processing, reasoning, critical thinking, risk perception, or decision-making. Complementary evidence was included to support the interpretation of the phenomenon but was not considered directly generalizable to high school students.

**Table 2.**

*Characteristics of the studies included in the systematic review*

| No. | Author(s)<br>and year      | Main topic                                      | Population /<br>context                    | Design                         | Main contribution                                                                                               |
|-----|----------------------------|-------------------------------------------------|--------------------------------------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------|
| 1   | Miozzo et al.<br>(2020)    | Foreign language effect and decision-making     | Bilingual / foreign-language users         | Experimental study             | Shows that language context can influence decision-making and moral judgment.                                   |
| 2   | McFarlane et al. (2020)    | Thinking in a non-native language               | Foreign-language users                     | Cognitive / experimental study | Explains how non-native language use may modify reasoning and decision processes.                               |
| 3   | Białek et al. (2020)       | Foreign-language reasoning and cognitive effort | Adult participants                         | Experimental study             | Indicates that reasoning in a foreign language may increase cognitive effort and reduce accuracy in some tasks. |
| 4   | Circi et al. (2021)        | Foreign language effect on decision-making      | Multiple populations                       | Meta-analysis                  | Identifies effects on moral decisions and risk-related judgments.                                               |
| 5   | Icenogle & Cauffman (2021) | Adolescent decision-making                      | Adolescents                                | Review                         | Explains cognitive, emotional, developmental, and contextual factors affecting adolescent decisions.            |
| 6   | Del Maschio et al. (2022)  | Language and decision-making                    | Bilingual and foreign-language populations | Meta-analysis                  | Confirms that decision outcomes can vary according to the language used.                                        |



| No. | Author(s)<br>and year      | Main topic                                                | Population /<br>context        | Design                                      | Main contribution                                                                                                         |
|-----|----------------------------|-----------------------------------------------------------|--------------------------------|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| 7   | Yuan et al.<br>(2022)      | Critical thinking<br>in EFL education                     | EFL educational<br>contexts    | Systematic<br>review                        | Supports the integration of<br>critical thinking into English-<br>language instruction.                                   |
| 8   | Hirai et al.<br>(2022)     | Critical-thinking<br>assessment in<br>EFL                 | EFL learners                   | Instrument<br>development and<br>validation | Identifies analysis, inference,<br>and consistency as measurable<br>critical-thinking skills.                             |
| 9   | Li (2023)                  | Critical thinking<br>in EFL<br>classrooms                 | Teachers and EFL<br>classrooms | Educational /<br>qualitative study          | Highlights the role of<br>classroom practices in the<br>development of critical<br>thinking.                              |
| 10  | Li & Liu<br>(2024)         | Critical-thinking<br>dimensions in<br>EFL                 | 1,169 EFL<br>learners          | Questionnaire<br>validation                 | Identifies analysis, inference,<br>argument evaluation,<br>reflection, cultural<br>comparison, and source<br>credibility. |
| 11  | Fernandes et<br>al. (2024) | Critical thinking<br>in high-school<br>English classes    | Years 10–12<br>students        | Qualitative<br>educational study            | Provides direct evidence of<br>critical-thinking processes in<br>secondary English classes.                               |
| 12  | Raslan &<br>Forawi (2024)  | Critical-thinking<br>aptitude                             | 91 high-school<br>students     | Quantitative<br>study                       | Examines high-school<br>students' critical-thinking<br>abilities using the W-GCTA.                                        |
| 13  | Liu & Wang<br>(2024)       | English learning,<br>AI tools, and<br>critical thinking   | 90 EFL learners                | Intervention /<br>mixed-method<br>study     | Shows that structured English-<br>learning experiences can<br>influence critical-thinking<br>development.                 |
| 14  | Purpuri et al.<br>(2025)   | Foreign language<br>effect across<br>cognitive<br>domains | Multiple<br>populations        | Review                                      | Identifies proficiency, age,<br>personality, and task<br>characteristics as possible<br>moderating factors.               |
| 15  | Li et al. (2026)           | Critical-thinking<br>dispositions in<br>English courses   | 853 graduate<br>students       | Longitudinal<br>educational study           | Shows that discipline-specific<br>and current English-language                                                            |



| No. | Author(s)<br>and year | Main topic | Population /<br>context | Design | Main contribution |
|-----|-----------------------|------------|-------------------------|--------|-------------------|
|-----|-----------------------|------------|-------------------------|--------|-------------------|

materials can support critical-  
thinking dispositions.

The evidence concerning high-school English classes is especially supported by Fernandes et al. (2024), while Raslan and Forawi (2024) specifically examined high-school students' critical-thinking aptitudes.

Li and Liu's study validated seven dimensions of critical thinking among EFL learners, whereas Li et al. (2026) analyzed the development of critical-thinking dispositions in an English for General Academic Purposes context.

i) Data analysis procedure

The analysis procedure began with the definition of the search descriptors and analytical categories.

The retrieved documents were organized in a documentary matrix containing:

- Author.
- Year.
- Objective.
- Methodological design.
- Country.
- Population.
- Context.
- Main variables.
- Main findings.
- Relationship with English-language processing.
- Relationship with decision-making.
- Contribution to the research question.

Data extraction was performed systematically by the same reviewer who conducted the screening and eligibility assessment. Information from the included studies was recorded in the documentary matrix using the predefined analytical categories.

The final documentary matrix consisted of the 15 studies that met the inclusion criteria.

The information was synthesized into four analytical categories:



1. Foreign-language processing and cognitive effort.

Includes foreign language effect, cognitive load, analytical reasoning, intuitive processing, and information processing.

2. Critical thinking in EFL education.

Includes analysis, inference, argument evaluation, self-reflection, cultural comparison, and evaluation of source credibility.

3. Decision-making and adolescent cognition.

Includes evaluation of alternatives, risk assessment, emotional response, consequences, problem solving, and final choice.

4. Educational context and teaching strategies.

Includes classroom interaction, discussion, questioning, instructional materials, English-language activities, and strategies designed to promote higher-order thinking.

These categories were used to answer the research question:

What does the available evidence suggest about the relationship between thinking in English and decision-making among high school students?

### 3. RESULTS

The results were obtained through a qualitative systematic literature review focused on analyzing the influence of thinking in English on decision-making among high school students. After applying the identification, screening, eligibility, and inclusion stages established through the PRISMA 2020 model, 15 scientific studies published between 2020 and 2026 were finally selected for documentary analysis.

The selected studies were organized through an analysis matrix considering author, year of publication, predominant analytical category, study focus, main contribution, and type of evidence. For interpretative purposes, each publication was classified according to four main categories: foreign-language processing and cognitive effort; critical thinking in EFL education; decision-making and adolescent cognition; and educational context and teaching strategies.

Of the 15 studies analyzed, 4 studies (26.7%) were mainly related to foreign-language processing and cognitive effort; 5 studies (33.3%) focused on critical thinking in EFL



education; 3 studies (20.0%) addressed decision-making and adolescent cognition; and 3 studies (20.0%) were primarily associated with educational context and teaching strategies.

**Table 3.**

*Distribution of included studies according to the main analytical categories*

| Predominant analytical category                  | Number of studies | Percentage |
|--------------------------------------------------|-------------------|------------|
| Foreign-language processing and cognitive effort | 4                 | 26.7%      |
| Critical thinking in EFL education               | 5                 | 33.3%      |
| Decision-making and adolescent cognition         | 3                 | 20.0%      |
| Educational context and teaching strategies      | 3                 | 20.0%      |
| Total                                            | 15                | 100%       |

Note. The table presents the distribution of the 15 studies included in the systematic review according to the four analytical categories established in the methodology. Percentages were calculated considering the total number of included studies (n = 15).

The results show a greater presence of studies related to critical thinking in EFL education, representing 33.3% of the selected literature. These studies mainly examine processes such as analysis, inference, argument evaluation, reflection, source credibility, and the development of higher-order thinking through English-language learning.

The second most represented category was foreign-language processing and cognitive effort, accounting for 26.7% of the studies. These investigations focused on the foreign language effect, cognitive effort, intuitive and analytical reasoning, and the possible changes that occur when individuals process information in a non-native language.

Studies related to decision-making and adolescent cognition represented 20.0% of the sample. These publications addressed the evaluation of alternatives, risk perception, moral judgment, cognitive and emotional factors, and the developmental characteristics associated with decision-making.

Finally, another 20.0% of the studies corresponded to educational context and teaching strategies. These investigations emphasized the importance of classroom practices, instructional materials, structured learning activities, discussion, and opportunities for students to analyze and justify ideas in English.

**Table 4.**



*Classification of included studies according to predominant analytical categories*

| No. | Author(s)<br>and year      | Predominant<br>analytical<br>category                  | Study focus                                  | Main contribution                                                                                                                        | Type of<br>evidence |
|-----|----------------------------|--------------------------------------------------------|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| 1   | Miozzo et al.<br>(2020)    | Foreign-language<br>processing and<br>cognitive effort | Foreign language<br>effect                   | Shows that the language used to<br>process information may<br>influence judgment and<br>decision-making.                                 | Complementary       |
| 2   | McFarlane et<br>al. (2020) | Foreign-language<br>processing and<br>cognitive effort | Thinking in a<br>non-native<br>language      | Examines how the use of a<br>foreign language may alter<br>reasoning and cognitive<br>processing during decisions.                       | Complementary       |
| 3   | Białek et al.<br>(2020)    | Foreign-language<br>processing and<br>cognitive effort | Cognitive effort<br>and reasoning            | Indicates that reasoning in a<br>foreign language may increase<br>cognitive demands and affect<br>accuracy in complex tasks.             | Complementary       |
| 4   | Purpuri et al.<br>(2025)   | Foreign-language<br>processing and<br>cognitive effort | Foreign language<br>effect across<br>domains | Identifies proficiency, age,<br>personality, and task<br>characteristics as factors that<br>may moderate the foreign<br>language effect. | Complementary       |
| 5   | Yuan et al.<br>(2022)      | Critical thinking in<br>EFL education                  | Critical thinking<br>in English<br>teaching  | Highlights the importance of<br>integrating critical thinking into<br>EFL instruction through<br>appropriate pedagogical<br>practices.   | Complementary       |
| 6   | Hirai et al.<br>(2022)     | Critical thinking in<br>EFL education                  | Assessment of<br>critical thinking           | Identifies analysis, inference,<br>and consistency as relevant<br>skills that can be evaluated<br>through English.                       | Complementary       |
| 7   | Li (2023)                  | Critical thinking in<br>EFL education                  | EFL classroom<br>practices                   | Emphasizes the role of teachers<br>and classroom interaction in<br>promoting critical thinking.                                          | Complementary       |



| No. | Author(s)<br>and year            | Predominant<br>analytical<br>category             | Study focus                                            | Main contribution                                                                                                                                      | Type<br>of<br>evidence |
|-----|----------------------------------|---------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| 8   | Li & Liu<br>(2024)               | Critical thinking in<br>EFL education             | Dimensions of<br>critical thinking                     | Identifies analysis, inference,<br>argument evaluation, self-<br>reflection, cultural comparison,<br>and source credibility as<br>relevant dimensions. | Complementary          |
| 9   | Raslan &<br>Forawi<br>(2024)     | Critical thinking in<br>EFL education             | Critical-thinking<br>aptitude in high<br>school        | Provides evidence concerning<br>critical-thinking abilities among<br>high-school students.                                                             | Direct                 |
| 10  | Circi et al.<br>(2021)           | Decision-making<br>and adolescent<br>cognition    | Foreign language<br>and decision-<br>making            | Shows that foreign-language<br>use may influence moral<br>judgments and decisions<br>involving risk.                                                   | Complementary          |
| 11  | Del Maschio<br>et al. (2022)     | Decision-making<br>and adolescent<br>cognition    | Language-<br>dependent<br>decision-making              | Demonstrates through meta-<br>analytic evidence that decision<br>outcomes may vary according<br>to the language used.                                  | Complementary          |
| 12  | Icenogle &<br>Cauffman<br>(2021) | Decision-making<br>and adolescent<br>cognition    | Adolescent<br>decision-making                          | Explains the interaction of<br>cognitive, emotional,<br>developmental, and contextual<br>factors in adolescent decisions.                              | Complementary          |
| 13  | Fernandes et<br>al. (2024)       | Educational context<br>and teaching<br>strategies | Critical thinking<br>in high-school<br>English classes | Demonstrates that secondary<br>English classrooms provide<br>opportunities for critical-<br>thinking processes.                                        | Direct                 |
| 14  | Liu & Wang<br>(2024)             | Educational context<br>and teaching<br>strategies | Structured<br>English-learning<br>activities           | Shows that structured learning<br>experiences can contribute to<br>critical-thinking development in<br>EFL contexts.                                   | Complementary          |
| 15  | Li et al.<br>(2026)              | Educational context<br>and teaching<br>strategies | English<br>instructional<br>materials                  | Indicates that carefully selected<br>English-language materials can                                                                                    | Complementary          |



| No. | Author(s)<br>and year | Predominant<br>analytical<br>category | Study focus | Main contribution                                             | Type<br>of<br>evidence |
|-----|-----------------------|---------------------------------------|-------------|---------------------------------------------------------------|------------------------|
|     |                       |                                       |             | support the development of<br>critical-thinking dispositions. |                        |

**Note.** The table presents the classification of the 15 studies included in the systematic review according to the four analytical categories established in the methodology. The studies were also differentiated according to their correspondence with the target population. Direct evidence refers to research specifically conducted in high-school or secondary-education contexts and directly relevant to the population analyzed. Complementary evidence refers to studies involving other EFL learners, bilingual participants, adults, university populations, or broader adolescent groups whose findings contribute to understanding the cognitive mechanisms involved in thinking in English and decision-making.

The distinction between direct and complementary evidence was important because the reviewed literature showed that research specifically examining the relationship between thinking in English and decision-making among high-school students remains limited. Studies classified as direct evidence contribute primarily to understanding critical thinking in secondary educational contexts, whereas complementary studies provide evidence concerning the foreign language effect, cognitive processing, reasoning, risk evaluation, and decision-making.

Qualitative Analysis of the Results

The reviewed studies indicate that thinking in a foreign language can influence cognitive processing and decision-making, although the direction and magnitude of this influence are not identical across all situations. Studies focused on the foreign language effect suggest that processing information in English or another non-native language may modify the balance between intuitive and analytical reasoning. In some circumstances, foreign-language processing may reduce emotionally driven responses, while in others it may increase cognitive effort and make complex reasoning more demanding.

The findings related to critical thinking in EFL education show that English learning can provide opportunities for students to develop analysis, inference, argument evaluation, self-reflection, and evaluation of information sources. However, these abilities do not



develop automatically through exposure to English. The studies emphasize the importance of instructional practices that encourage students to interpret information, compare viewpoints, justify answers, question assumptions, and evaluate evidence.

The evidence concerning decision-making and adolescent cognition demonstrates that decisions during adolescence are influenced by multiple factors. Cognitive development interacts with emotional responses, risk perception, social context, and the ability to anticipate consequences. From this perspective, the language in which information is processed may constitute an additional factor affecting how alternatives are interpreted and evaluated.

The reviewed studies also demonstrate that the educational context plays a significant role. English classrooms can become environments for higher-order thinking when students are required to solve problems, discuss alternatives, defend positions, assess evidence, and reflect on their conclusions. Structured tasks and carefully selected instructional materials appear particularly relevant for promoting this type of cognitive engagement.

Overall, the findings suggest that thinking in English may influence decision-making through the interaction of foreign-language processing, cognitive effort, critical thinking, emotional factors, and educational experience. Nevertheless, the evidence does not support the assumption that thinking in English always leads to better decisions. Its effects appear to depend on factors such as language proficiency, cognitive demands, task characteristics, emotional involvement, age, and learning context.

Therefore, the results support a multidimensional interpretation of the phenomenon. The influence of thinking in English on decision-making among high-school students should not be understood only as a linguistic effect, but as the result of the interaction between language proficiency, cognitive processing, critical-thinking abilities, adolescent development, and the educational conditions in which English is learned and used.

#### **4. DISCUSSION**

The results obtained suggest that thinking in English can influence decision-making by modifying the way individuals process information, evaluate alternatives, interpret risk, and regulate emotional responses. However, the reviewed evidence also indicates that this



influence is not uniform, since it may vary according to language proficiency, cognitive demands, task characteristics, age, and educational context.

The findings were interpreted according to the four analytical categories established in the methodology: **foreign-language processing and cognitive effort; critical thinking in EFL education; decision-making and adolescent cognition; and educational context and teaching strategies**. These categories make it possible to understand the phenomenon as multidimensional, since decision-making in a foreign language involves linguistic, cognitive, emotional, developmental, and educational components.

The systematic review showed that the literature does not support the idea that thinking in English always leads to better decisions. Instead, the effects of foreign-language processing appear to depend on the characteristics of the task and the learner. Miozzo et al. (2020) found that language context can influence judgment and decision-making, while McFarlane et al. (2020) explain that using a non-native language may modify the cognitive processes involved in reasoning.

Regarding the first category, studies on foreign-language processing and cognitive effort show that the use of English or another non-native language can alter the balance between intuitive and analytical processing. Białek et al. (2020) found that reasoning in a foreign language may increase cognitive effort and sometimes reduce accuracy, particularly when individuals need to detect conflicts between logical information and intuitive beliefs. This suggests that foreign-language processing may generate greater reflection in some situations but may also impose an additional cognitive burden.

Similarly, Purpuri et al. (2025) indicate that the foreign language effect can vary according to factors such as language proficiency, age, personality, emotional involvement, and task characteristics. These findings are especially relevant for high school students because their English proficiency may differ considerably, which means that thinking in English may not produce the same cognitive effect for all learners.

In relation to critical thinking in EFL education, the reviewed studies demonstrate that English-learning environments can contribute to the development of analysis, inference, argument evaluation, reflection, and source evaluation. Yuan et al. (2022) emphasize that critical thinking should be intentionally incorporated into EFL instruction rather than assumed to develop automatically through language learning.



Hirai et al. (2022) demonstrated that critical-thinking abilities such as analysis, inference, and consistency can be measured in English-language contexts. Similarly, Li and Liu (2024) identified dimensions such as argument evaluation, self-reflection, cultural comparison, and evaluation of source credibility. These abilities are directly related to decision-making because students must interpret information, compare alternatives, identify reliable evidence, and justify their conclusions.

Li (2023) also highlights that teachers and classroom practices play an important role in the development of critical thinking. Therefore, learning English becomes cognitively meaningful when students are encouraged to question, compare, explain, and defend ideas rather than simply reproduce linguistic forms.

The category of decision-making and adolescent cognition also provides important findings. Icenogle and Cauffman (2021) explain that adolescent decision-making is influenced by cognitive, emotional, developmental, and contextual factors. This means that the use of English should be understood as one variable within a broader decision-making process rather than as an isolated determinant.

Circi et al. (2021), through a meta-analysis, found that foreign-language use can influence moral judgment and risk-related decisions. Likewise, Del Maschio et al. (2022) confirmed that decision-making may vary depending on the language in which information is processed. These findings support the idea that language can become part of the cognitive context in which a decision is formed.

However, most experimental evidence concerning the foreign language effect comes from adult or university populations. Therefore, its application to high school students should be interpreted carefully. The findings can provide a theoretical explanation of the phenomenon, but they should not be considered directly generalizable to all adolescents.

Regarding educational context and teaching strategies, the reviewed studies indicate that English classrooms can provide opportunities to practice higher-order thinking. Fernandes et al. (2024) showed that high school English classes can include processes related to critical thinking, particularly when students are asked to interpret, discuss, and evaluate information. Raslan and Forawi (2024) also emphasize the importance of developing how students think rather than focusing only on what they think. This perspective is especially relevant to



decision-making because students need opportunities to analyze evidence, compare alternatives, and justify their conclusions.

Liu and Wang (2024) found that structured English-learning experiences can contribute to critical-thinking development, while Li et al. (2026) highlight the importance of selecting meaningful and current academic materials. These findings suggest that the cognitive impact of English depends partly on how the language is used in educational activities.

A relevant finding of this review is that thinking in English should not be interpreted as a mechanism that automatically improves rationality. In some cases, a foreign language may reduce emotional intensity or modify intuitive responses, but in other cases it may increase cognitive load and make complex reasoning more difficult.

For this reason, the educational use of English should be accompanied by appropriate pedagogical support. Activities such as debates, problem-solving tasks, comparison of alternatives, case analysis, reflective questioning, and argument evaluation may help students connect English-language learning with decision-making processes.

The reviewed evidence also suggests that language proficiency is an important moderating factor. Students with higher proficiency may be better able to focus on the cognitive demands of a task, whereas students with limited proficiency may devote a greater amount of mental resources to understanding vocabulary and grammar. Consequently, the same decision-making activity may produce different outcomes depending on the student's linguistic competence.

In relation to the evidence analyzed, this review contributes an organization of the recent literature into four categories: foreign-language processing and cognitive effort; critical thinking in EFL education; decision-making and adolescent cognition; and educational context and teaching strategies. This classification makes it possible to interpret the relationship between language and decision-making from a broader educational perspective. Finally, the findings suggest that the influence of thinking in English becomes more educationally relevant when English is used as a tool for reflection, analysis, comparison, and problem solving. Therefore, future research should examine this relationship more directly among high school students and should consider variables such as English proficiency, age, task difficulty, emotional involvement, and classroom methodology.

#### **Limitations of the review**



An additional limitation is that title and abstract screening, full-text eligibility assessment, and data extraction were conducted by a single reviewer. The absence of independent duplicate review may have increased the risk of selection or interpretation bias during the review process.

Another limitation concerns the heterogeneity of the selected studies. The investigations differ in population, age, language proficiency, methodological design, type of task, cognitive variable, and educational context. As a result, the findings should not be interpreted as evidence that English has the same effect on decision-making in all students.

The review was also limited to publications from **2020 to 2026**, written in English or Spanish and identified through the databases included in the methodology. These criteria may have excluded relevant studies published in other languages, earlier research, or documents indexed in other academic sources.

In addition, several studies were classified as complementary evidence because they involved adults, university students, or broader EFL populations rather than high school students. This distinction was necessary to avoid direct generalization of findings that were obtained from populations different from the target group.

Despite these limitations, the use of PRISMA 2020 made it possible to organize the stages of identification, screening, eligibility, and inclusion in a transparent manner and to maintain coherence between the methodology, analytical categories, results, and discussion.

## 5. CONCLUSIONS

The available evidence suggests a possible relationship between foreign-language processing and cognitive processes involved in reasoning, critical thinking, evaluation of alternatives, and decision-making. However, the evidence specifically derived from high school students remains limited, and a substantial proportion of the studies included in this review involved complementary populations such as adults, university students, bilingual speakers, and broader EFL learners.

The reviewed studies indicate that processing information in English or another foreign language may be associated with differences in analytical reasoning, cognitive effort, risk perception, emotional response, and evaluation of alternatives. Nevertheless, these



associations should not be interpreted as evidence of a direct or uniform effect on high school students.

The possible relationship between thinking in English and decision-making appears to vary according to several factors, including language proficiency, cognitive load, age, task difficulty, emotional involvement, and educational context. These variables may influence whether foreign-language processing facilitates reflection or, conversely, increases cognitive demands.

Critical thinking represents an important link between English-language learning and decision-making processes. Skills such as analysis, inference, argument evaluation, self-reflection, source evaluation, and comparison of alternatives may be strengthened when English-learning activities intentionally promote higher-order thinking.

The educational context also appears to be relevant. English classes may provide opportunities to develop reasoning and decision-making skills through debates, problem-solving activities, case analysis, discussion, and tasks requiring students to justify conclusions and evaluate evidence. However, these educational implications should be considered cautiously because the direct evidence available for secondary-school populations remains limited.

Overall, the findings suggest that thinking in English may be related to decision-making processes among high school students, but the current evidence does not support a causal or universally applicable conclusion. Further research conducted directly with secondary-school students under real classroom conditions is needed to clarify the nature, magnitude, and conditions of this relationship.

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## CONFLICT OF INTEREST

None.

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## AUTHOR CONTRIBUTIONS

Conceptualization: Denny Jineth Jara Arias, Yesenia Margarita Cruz Macas, Margarita Mariuxi González Sarmiento, Jimmy Jovanny Gonzalez Carrasco, Mercedes Lisseth Luna Reascos.



Methodology: Denny Jineth Jara Arias, Yesenia Margarita Cruz Macas, Margarita Mariuxi González Sarmiento, Jimmy Jovanny Gonzalez Carrasco, Mercedes Lisseth Luna Reascos.

Investigation: Denny Jineth Jara Arias, Yesenia Margarita Cruz Macas, Margarita Mariuxi González Sarmiento, Jimmy Jovanny Gonzalez Carrasco, Mercedes Lisseth Luna Reascos.

Writing – original draft: Denny Jineth Jara Arias, Yesenia Margarita Cruz Macas, Margarita Mariuxi González Sarmiento, Jimmy Jovanny Gonzalez Carrasco, Mercedes Lisseth Luna Reascos.

Writing – review and editing: Denny Jineth Jara Arias, Yesenia Margarita Cruz Macas, Margarita Mariuxi González Sarmiento, Jimmy Jovanny Gonzalez Carrasco, Mercedes Lisseth Luna Reascos.

