

## Necessary Conditions for Critical Thinking

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### Abstract

**Relevance.** The endeavour to generalise conceptual definitions of critical thinking from the corpus of scientific literature faces challenges due to the diverse emphases placed by scholars across different disciplines and approaches. Such diversity leads to definitions that are too expansive and lack detail regarding the essential qualities of this cognitive process. Additionally, the propensity of numerous researchers to rely on intuitive perceptions, combined with ongoing discussions surrounding the concept's core elements, exacerbates the challenge of formulating clear, concise definitions.

**The purpose.** This research aims to clarify the phenomenon of critical thinking amidst the existence of numerous, often conflicting interpretations. Specifically, it aims to propose an alternative to the broad definitions commonly accepted, which tend to classify any effective thinking as critical thinking. Furthermore, this investigation delves into the historical development and objectives of the critical thinking movement.

**Results.** Through the examination of definitions from distinguished scholars such as John Dewey, Peter Facione, Robert Ennis, and John McPeck, as well as an analysis of the critical thinking phenomenon itself, this study identifies the essential conditions for critical thinking. The research posits that critical thinking meets three fundamental criteria, each individually necessary and collectively sufficient, to classify certain forms of thought as critical. These criteria encompass the pursuit of rationality characteristics, including objectivity, reasonableness, accuracy, and efficiency; the incorporation of a metacognitive component; and the utilisation of thinking methods and strategies that are accessible to a diverse audience.

**Conclusions.** By contrasting this framework with alternative perspectives, the study articulates distinct benchmarks for differentiating critical thinking from other forms of thought. This delineation is particularly valuable in both scholarly and educational contexts, facilitating a deeper understanding of the parallels and distinctions between 'critical thinking' and related concepts.

**Keywords:** critical thinking, thinking, definition, metacognition, reasonableness, rationality, efficiency

## Необхідні умови критичного мислення

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### Анотація

**Актуальність** даного дослідження викликана відсутністю в сучасній науковій літературі консенсусу щодо визначення критичного мислення. Спроби узагальнити наявні дефініції критичного мислення зіштовхуються з тим, що представники різних наукових дисциплін та підходів роблять акцент на відмінних аспектах критичного мислення, часто спираючись при цьому скоріше на інтуїтивні уявлення, ніж на результати обґрунтованого дослідження. Тривають активні дебати не тільки щодо різних аспектів критичного мислення, але і щодо його сутнісних рис.

**Мета** даного дослідження полягає в тому, щоб прояснити феномен критичного мислення в контексті наявності його численних та суперечливих визначень. Зокрема, у дослідженні робиться спроба запропонувати альтернативу надто загальним тлумаченням критичного мислення, які, не наводячи в своїх дефініціях конкретики, пропонують вважати критичним мисленням будь-який прояв вдалого мислення. Також при розгляді піднятих питань в цьому дослідженні взято до уваги не тільки концептуальну, але й історичну конкретність терміну «критичне мислення», аналізуючи специфіку появи та розвитку руху критичного мислення.

**Результати** дослідження полягають в тому, що завдяки аналізу визначень критичного мислення, у тому числі тих, що були надані у роботах Джона Дьюї, Пітера Фесіона, Роберта Енніса та Джона Макпека, а також в результаті ретельного дослідження самого феномену, який позначають ці дефініції, в статті було визначено необхідні умови критичного мислення. Дослідження виявило, що критичне мислення втілюється в життя завдяки трьом умовам, кожна з яких окремо є необхідною умовою, а всі вони у сукупності є достатньою умовою для даного типу мислення: по-перше, критичне мислення прагне втілити такі характеристики раціональності, як об'єктивність, обґрунтованість, точність та ефективність; по-друге, воно включає в себе метакогнітивний компонент; по-третє, критичне мислення використовує мисленнєві процедури, які доступні широкому колу осіб.

**Висновки** даного дослідження полягають в тому, що, у порівнянні з альтернативними поглядами, запропоноване у статті розуміння надає чіткі критерії, щоб відрізнити критичне мислення від інших типів мислення. Показано, що результати даного дослідження можуть бути цінними як у дослідницьких, так і в освітніх цілях, зокрема для з'ясування спільності та відмінностей між терміном «критичне мислення» і спорідненими термінами.

**Ключові слова:** критичне мислення, мислення, дефініція, метакогнітивний процес, обґрунтованість, раціональність, ефективність

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### Introduction.

While the term ‘critical thinking’ is frequently employed in scholarly discourse, its precise definition often remains elusive. The literature reveals numerous descriptions that vary not only in nuances but also in their core components. This diversity underscores the necessity for renewed efforts in delineating the conditions and fundamentals that underpin critical thinking alongside an analysis of its existing conceptualisations.

The body of scientific literature concerning critical thinking is extensive, encompassing a wide range of perspectives and insights. Notably, Facione’s seminal work in 1990 synthesised the views of 46 experts, shedding light on the essence of critical thinking. McPeck’s 2017 publication provided a critical evaluation of prevailing interpretations, while Ennis’ 2016 study explored the critical elements for defining critical thinking. Furthermore, Paul and Elder’s 2019 work highlighted the importance of intellectual standards as a foundational element for the development and evaluation of this thought process, and Hitchcock’s 2022 overview, alongside Pithers and Soden’s 2000 review, illustrated its varied conceptual landscape. Despite the abundance of scholarly work, ongoing debates underscore the complex nature of critical thinking, with questions about its definitive characteristics persisting. These discussions extend beyond specific aspects, encompassing fundamental inquiries into its essence.

Our research aims to scrutinise the prevailing definitions of critical thinking and the phenomenon itself, with the objective of delineating its necessary conditions. In addition, we propose our perspective on what constitutes the sufficient condition for critical thinking. Through this investigation, we aspire to contribute to the continuing discourse by offering a definition that provides clear and concise criteria for understanding critical thinking. Our goal is to develop a framework that both practitioners and researchers can effectively apply in their respective endeavours, thereby fostering a deeper understanding of critical thinking principles.

### **The Pursuit of Objectivity, Reasonableness, Accuracy, and Efficiency.**

The efforts to standardise definitions of critical thinking within the scientific community inevitably encounter several challenges. Firstly, scholars from varied fields such as logic, psychology, and pedagogy emphasise different aspects when discussing critical thinking, leading to diverse interpretations regarding its core essence. Secondly, the apparent simplicity and intuitiveness of the term often prompt researchers to rely on subjective notions rather than a comprehensive understanding. Thirdly, as ‘critical thinking’ is a relatively recent concept in academia, it is subject to ongoing discussions about its fundamental characteristics. Consequently, attempts to amalgamate the available definitions of critical thinking often yield general statements lacking specificity.

For instance, Pithers and Soden (2000) assert, “‘Good thinking’ and ‘thinking well’ are commonly used terms bound up with what is called ‘critical thinking’ in the research literature’ (p. 237). Yet, such terminology is vague and fails to precisely capture the essence of critical thinking, permitting a broad array of thought processes to be considered ‘good’ for various reasons. Indeed, while some traits identified by Pithers and Soden are common across multiple definitions, they do not sufficiently clarify the concept; rather, they highlight the ambiguity that pervades current understandings.

In the scholarly dialogue on critical thinking, certain authors endeavour to elucidate the concept of ‘good’ within its context. For instance, Hitchcock (2022) posits that critical thinking entails ‘careful thinking directed to a goal’. However, these characterisations lack the specificity required for a clear distinction between critical and non-critical thinking. Identifying the precise attributes that render thinking both careful and goal-oriented is crucial for this differentiation. Due to this lack of specificity, different authors may adopt disparate criteria for evaluating the thoroughness and purposefulness of thought. As a result, descriptors such as ‘careful’ and ‘directed to a goal’ are insufficient for substantially deepening our comprehension of this intellectual capability.

In our perspective, it is more judicious to describe critical thinking as a series of cognitive processes aimed at embodying the characteristics of rationality, commonly interpreted as objectivity, reasonableness, accuracy, and efficiency. The objective of critical thinking is to diminish elements of irrationality and fortify the rational dimension of cognitive activities, employing the previously mentioned criteria as indicators for this purpose. Therefore, we posit that alignment with these rationality attributes serves as the essential benchmark for classifying a cognitive process as critical thinking.

The question then arises: How can one ascertain whether a cognitive process is aligned with achieving these four characteristics? We contend that cognition cannot be deemed objective if it is predominantly influenced by emotions rather than factual evidence. Similarly, a cognitive process should not be considered as striving for reasonableness if it is not underpinned by robust evidence. Moreover, we maintain that cognition lacks accuracy if it depends on information that fails to accurately reflect reality. Furthermore, a cognitive process cannot be considered efficient if it does not demonstrate a commitment to excel in problem-solving skills.

To explore the indispensable nature of these characteristics for critical thinking, we pose the following inquiry: Is it possible for critical thinking to exist in the absence of a deliberate effort to foster objectivity, reasonableness, accuracy, and efficiency? Clearly, thought processes that do not adhere to this orientation cannot be classified as critical thinking.

In presenting the justification for the identified condition, it is imperative to clarify the rationale behind our preference for the terminology ‘characteristics of rationality’ over ‘intellectual standards’, as explored by Linda Elder and Richard Paul. In their work, Paul and Elder (2019) introduce a framework of 10 intellectual standards for critical thinking, which they describe as essential for ‘making sound judgments or for reasoning well, for forming knowledge (as against unsound beliefs), for intelligent understanding, for thinking rationally and logically’. In evaluating the alignment of thought processes with specific standards, individuals discern the presence or lack of particular traits. However, this methodology overlooks the fact that rationality attributes can manifest themselves with varying degrees of intensity. For instance, is it feasible for a singular standard concerning the depth of thought to uniformly apply across both routine decision-making and the intricate analysis required in research contexts? Given these considerations, utilising ‘characteristic’ instead of ‘standard’ seems more suitable for the assessment of thought. This terminology enables the recognition of distinct attributes without imposing a rigid, static framework, thereby allowing for the recognition of different degrees of expression.

Regarding the 10 standards outlined by Linda Elder and Richard Paul (clarity, accuracy, relevance, logicalness, breadth, precision, significance, completeness, fairness, and depth), our analysis recommends an exclusive emphasis on the fundamental characteristics of rationality. While reflecting aspects highlighted by Paul and Elder, these elements also integrate additional dimensions not explicitly mentioned in their framework.

#### **Inclusion of a Metacognitive Component.**

Is the pursuit of objectivity, reasonableness, accuracy, and efficiency sufficient to qualify as critical thinking? We posit that, while essential, these criteria alone are not adequate. Critical thinking is characterised not merely by its aspiration towards these attributes but also by its capability to embody them. It is a misconception to categorise all thought processes that claim to be critical as such. Authentic critical thinking, in its application, requires adherence to a specific methodology that encompasses meticulous consideration of its implementation process, necessitating a metacognitive element. This constitutes the second indispensable criterion; conformity to this principle distinctly marks the essence of critical thinking.

To effectively address the second necessary condition, an examination of prevalent perspectives among scholars is necessary to distinguish our viewpoint from theirs. Many authors define critical thinking as the process of identifying flaws and weaknesses. Yet, it is crucial to acknowledge that not all critique constitutes critical thinking. For instance, critique rooted in conflicting political ideologies often serves to perpetuate one belief system at the expense of another, lacking impartiality. Criticism can take various forms, and a mere

inclination towards critique does not inherently qualify as an indicator of critical thinking.

This concept is paralleled in the interpretation of critical thinking as ‘reflective scepticism’, as proposed by McPeck (2017, p. 8). It is our conviction that not all individuals who question the validity of their reasoning inherently demonstrate critical thinking abilities. For instance, ancient sceptics, driven by their doubts, advocated refraining from making any judgments, leading to numerous anecdotes where philosophers were unable to make necessary decisions in crucial circumstances, treating all propositions with scepticism.

It is true that ‘despite the variety of definitions of critical thinking and the multitude of components critical thinking encompasses, there appears to be agreement that one key aspect of critical thinking is the ability to avoid bias in reasoning and decision-making’ (van Peppen et al., 2022, p. 262). Indeed, critical thinking endeavours to reduce bias, aligning with the previously discussed goal of fostering rationality, which inherently includes the pursuit of objectivity. However, the challenge arises: How can one ensure critical thinking is devoid of its own biases? To counteract prejudiced thinking, individuals must critically evaluate their thought processes across various topics. Thus, critical thinking necessitates a metacognitive component – introspection into one’s cognitive processes. This enables the identification of biases and other cognitive flaws (e.g., vagueness, unreasonableness, superficiality) and the exploration of methods to refine these processes, such as the necessity for more information or the importance of enhanced cognitive structuring.

Engagement in critical thinking involves a deliberate focus on refining one’s cognitive activities to align with predefined objectives. While critical thinking undoubtedly goes beyond self-reflection to include the evaluation of others’ cognitive activities, it is important to recognise that the capacity to effect change in another’s cognitive processes towards improvement is inherently limited, if not entirely unfeasible.

We assert that the inclusion of a metacognitive aspect constitutes the second necessary condition for justifiably identifying an instance of thought as critical thinking.

#### **Simplicity and Accessibility of Critical Thinking Techniques.**

Thus far, we have delineated two necessary conditions for critical thinking. However, this prompts the question: Does mere orientation towards the acquisition of rationality characteristics such as objectivity, reasonableness, accuracy, and efficiency, coupled with the implementation of this orientation in life through a metacognitive aspect, suffice to categorise thought as critically engaged? We argue that this perspective on critical thinking might be inadequate, as it fails to consider the significant historical context that informed the emergence and evolution of the ‘critical thinking’

concept. To ground our understanding of critical thinking in a more tangible context, it is imperative to explore the term's origins and historical development.

In reviewing the history of the term 'critical thinking', it is vital not to erroneously merge this inquiry with the broader discourse on rationality. Historically, the discourse on rationality has been extensive, featuring contributions from Socrates' dialectical method to the philosophies of Plato, Aristotle, the ancient sceptics, the Stoics, and later thinkers such as Descartes, Leibniz, Kant, and Frege. Nonetheless, it is essential to recognise that while these intellectuals have profoundly impacted our understanding of rationality, they were not directly involved in founding or shaping the contemporary critical thinking movement, which has its roots in more recent history.

As many researchers agree, 'The father of the current critical thinking movement is the philosopher John Dewey' (Ennis, 2016). Dewey, an influential American philosopher in the early 20th century, leveraged his intellectual background in the rich tradition of philosophical rationality. His innovative approach aimed to distil and adapt these complex theories for practical application. Dewey's scholarly pursuits were primarily inspired by his commitment as an educational reformer, aiming to transform the instructional methodologies within his country to foster the development of cognitive abilities suitable for a broad array of activities, especially those pertinent to daily life.

In 1910, Dewey published the book *How We Think*, in which he writes, 'The essence of critical thinking is suspended judgment; and the essence of this suspense is inquiry to determine the nature of the problem before proceeding to attempts at its solution. This, more than any other thing, transforms mere inference into tested inference, suggested conclusions into proof' (p. 74). If we delineate the components of critical thinking based on Dewey's description, we observe the following: 1) suspending premature judgment to thoroughly investigate the issue, 2) asking questions and gathering information to attain clarity on the issue, and 3) formulating conclusions about the issue and testing them. Notably, Dewey (1910) frequently used another term in this work – 'reflective thinking', defined as 'active, persistent and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends, constitutes reflective thought' (p. 6). The researchers' conceptualization of these two terms ('critical thinking' and 'reflective thinking') and the phenomena these terms represent established the groundwork for the critical thinking movement.

It is unsurprising that Dewey's ideas quickly gained popularity within pedagogical circles, as they aligned with the prevailing trend in US pedagogy at the time, which emphasised enhancing students' reasoning skills for tangible, real-life applications. In his seminal work,

he delves into various instances of reasoning, such as identifying gestures from afar, discerning the function of unfamiliar objects on a ferry, and formulating logical explanations for a room's disarray. The primary focus here was on fostering a foundational reasoning ability crucial for daily life rather than advancing the intellectual capabilities of scientists or scholars. The correlation between the early empirical validation of critical thinking proficiency, as demonstrated in studies with schoolchildren (Glaser, 1942), and its conceptual evolution, significantly shaped by the taxonomy of learning objectives proposed by Bloom et al. (1956), is not incidental. This convergence underlines the centrality of critical thinking's practical deployment, its relevance to everyday scenarios, and the commitment to nurturing these skills within school-age children as cornerstone principles advocated by the pioneers of the critical thinking discourse.

In our previous research, we provided data on the significant interest of university students in the development of critical thinking (Kulyk, 2020), as well as the fact that some university courses directly contribute to its enhancement (Kulyk, 2018). Within the discussion on critical thinking, a diverse array of scholars has contributed to the concept's evolution, extending its application beyond the initial contexts posited by Dewey and his contemporaries. Specifically, this broadening includes the integration of critical thinking in higher education and scientific endeavours (Fisher, 2004; Lack & Rousseau, 2016). Yet, these advancements serve to complement, not contradict, the foundational principles laid down by early advocates. That is, even as the discussion of critical thinking progresses into the 21st century, its proponents continue to emphasise its practical application, deliberately avoiding overly abstract or complex methodologies.

Given the term's historical development, a third necessary condition for critical thinking emerges: its applicability across a wide range of contexts, including everyday situations, and its adaptability for learners at all stages of education. Critical thinking should incorporate methods that are accessible to individuals without the need for specialised, extensive training. An illustration of this approach is the intentional avoidance of intricate technical language. Moreover, researchers highlight that numerous adept critical thinkers have achieved such competence without formal education in disciplines such as logic or scientific methodology (McPeck, 2017, p. 66).

#### **Comparison of Definitions.**

Upon examining the concept of 'critical thinking', we have identified three necessary conditions, which, when combined, form a sufficient condition for recognising thought processes as critical thinking. To encapsulate our investigation into critical thinking, we propose the following definition, denoted as 'Definition A': Critical thinking is a type of thinking that fulfils three conditions,



which are jointly sufficient and separately necessary for it. Firstly, such thinking is directed towards embodying characteristics of rationality, including objectivity, reasonableness, accuracy, and efficiency. Secondly, it accomplishes this by including a metacognitive component in the thinking process. Thirdly, critical thinking employs thinking procedures and techniques that can be mastered by a broad range of individuals.

In our discourse on critical thinking, it is pertinent to contrast our definition with two established definitions within the field. Definition B, proposed by Ennis (1996), posits, 'Critical thinking is reasonable reflective thinking focused on deciding what to believe or do. The emphasis is on reasonableness, reflection, and the process of making decisions' (p. 166). Similarly, Definition C, emerging from a collaborative effort led by Facione (1990) and commissioned by the American Philosophical Association, presents an insightful perspective: 'We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based.'

When comparing Definition A and Definition B, it becomes evident that the three essential conditions posited in Definition A find resonance in Definition B, albeit with notable distinctions. For instance, Definition A provides a more comprehensive description of the specific characteristics of rationality necessary for critical thinking. Moreover, while both definitions imply that critical thinking is accessible to a diverse array of individuals, Definition A broadens its application beyond mere decision-making processes.

Contrasting Definition A against Definition C reveals that in Definition C, critical thinking is expected to encompass the capacity for comprehensive understanding and articulation of its foundational bases, be they evidential, conceptual, methodological, criteriological, or contextual. These expectations align closely with the metacognitive requirement delineated as the second necessary condition in Definition A, albeit with Definition C delving deeper into this dimension of critical thought. In Definition C, the explicit mention of the first necessary condition of critical thinking, as identified in Definition A (the four characteristics of rationality), is absent. Nevertheless, one might infer their implicit consideration during discussions on the justification of evidential and other grounds. Despite this, we posit that merely possessing the capability to justify one's reasoning does not adequately fulfil the pursuit of objectivity, reasonableness, accuracy, and efficiency. Consider, for example, a situation where an individual arrives at a biased conclusion yet offers a justification rooted in emotional preference. Should this be regarded as critical thinking? Despite the rationale being coherently

presented, it fails to meet the criteria for critical thinking from our perspective. This scenario underscores a gap within Definition C's approach, which does not provide clear criteria to distinguish biased justifications from authentic critical thinking.

The third necessary condition identified in Definition A is not explicitly addressed in Definition C. Moreover, Definition C mandates that individuals proficient in critical thinking should be able to elucidate the conceptual, methodological, and criteriological foundations of their reasoning. This requirement seems to imply a need for critical thinkers to have a comprehensive education in scientific methodology. However, the instances of critical thinking provided by the experts in Facione's (1990) study predominantly feature everyday and educational contexts, highlighting examples such as 'appreciating the significance of a particular facial expression or gesture used in a given social situation' and 'restating what a person said using different words or expressions while preserving that person's intended meanings'. These illustrations suggest that understanding criteriological bases for reasoning might include abilities like discerning the emotional content of facial expressions in social interactions. Notably, the instances also encompass more complex tasks, such as clarifying terms and evaluating the reliability of information sources. Yet, it is apparent from Facione's examples that critical thinking is not deemed exclusive to those with extensive scientific education. Nevertheless, when comparing Definition A with Definition C, it is pertinent to note that Definition C does not directly affirm that critical thinking methodologies should be simple and universally accessible.

While each definition presents its advantages, we believe that Definition A offers the most explicit and comprehensive set of criteria for assessing whether a thought process can be classified as critical thinking.

### Conclusions.

The abundance of definitions surrounding critical thinking underscores that introducing yet another interpretation will unlikely resolve ongoing debates regarding its precise nature. Nonetheless, our objective was not to create a universally accepted definition but rather to develop one capable of fulfilling its intended purpose. Our endeavour aimed to articulate a definition that establishes practical, clear, and succinct criteria for identifying critical thinking, thereby serving the needs of both practitioners and researchers within this field. We believe that our proposed definition aligns with these criteria.

The formulation of such a definition paves the way for expansive opportunities in the context of critical thinking research. It facilitates further exploration into the nuances that distinguish 'critical thinking' from closely related concepts such as 'logic', 'creative thinking', and 'rationality', thereby enriching our understanding of them.

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