The Irreducibility of Thinking to Language

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In this paper, I argue that language does not, and cannot, comprehensively encapsulate thought and the thinking process. Psychology, as a science, asks for thinking and its related cognitive processes to be operationalized into measurable and observable terms. I first note the limits to empirical and experimental attempts of operationalizing thinking in psychological research, and raise the importance of a more interpretive and hermeneutical account of conceptualizing thinking. By showing the nature of language as arbitrary through the work of Ferdinand de Saussure and the capability for pre-linguistic cognition through a psychoanalytic account of object symbolization, I hope to demonstrate that there is an aspect of thinking that is irreducible to language. I distinguish between Heidegger's account of calculative and meditative thought as a different way of conceptualizing cognition, and thinking that is more interpretive and hermeneutical, rather than descriptive. By showing that thinking cannot be exhaustively reduced to language, the teaching of thinking becomes comprehensively impossible, given that language is used as the most dominant mode of lesson delivery and communication between teachers and students. Here, having problematized thinking, pedagogical questions and implications are raised: If language cannot exhaustively capture the thinking process, how then are educators to teach thinking and how do we learn to think?

Keywords: psychology, philosophy, critical thinking, linguistics

Searching for a definition of “thinking” in contemporary educational psychology textbooks is a difficult task. Even in cognitive and developmental psychology textbooks, often no explicit definition of what thinking is, how thinking works, or why thinking occurs is offered. Thinking is usually only mentioned as critical thinking along with
problem-solving skills, distinguishing the process of thinking to be specifically critical and with a specific goal. In *Educational Psychology*, an educational psychology textbook used in the Bachelors of Education programme at the University of British Columbia, critical thinking is defined as “evaluating conclusions by logically and systematically examining the problem, the evidence, and the solution” (Woolfolk et al., 2009, p. 359). This definition of critical thinking presupposes that other processes are already in place, such as the ability to read, to reason, to categorize, and to remember. These other processes that occur in the mind, or rather the brain, fall into the realm of cognition.

The difficulty in finding a definition for thinking points to a difference between thinking in psychological studies and the colloquial meaning of “thinking.” When a friend asks, “What did you do last night?” and you are having a little trouble with answering, you might say, “Let me think… Oh right, I had dinner with my mother.” To think in this scenario means to remember. In our everyday speech then, thinking can encompass more than critical thinking as defined above. Rather, it involves what psychologists call cognition. Cognition includes models of attention, memory, learning, and language acquisition. By looking at how psychologists, and specifically developmental cognitive psychologists, study cognition, I want to show the limitations of an empirical and experimental way of studying thinking. That is, by studying cognition in an experimental setting, there are aspects of thinking that cannot be captured either in language or outward behavioural responses such as questionnaires and tests. Admittedly, language does become a large part of our thinking; however, it fails to capture all aspects of it. By giving an account of psychological research methods in thinking, this critique is not intended to belittle psychological research, but rather to show its limitation when dealing with the mind.

In the following pages, I argue that language does not and cannot comprehensively encapsulate thought and the thinking process. Psychology, as a science, asks for thinking and its related cognitive processes to be operationalized into measurable and observable terms. By showing that the nature of language is arbitrary through the work of Ferdinand de Saussure and the possibility of pre-linguistic cognition through a psychoanalytic account of object symbolization, I hope to demonstrate that there is an aspect of thinking that is irreducible to language. I also distinguish between Heidegger’s account of calculative and meditative thought as a different way of conceptualizing cognition and thinking that is more interpretive and hermeneutical, rather than descriptive. If thinking cannot be exhaustively reduced to language, the teaching of thinking becomes not comprehensively possible, given that language is used as the most dominant mode of lesson delivery and communication between teachers and students. Lastly, pedagogical questions and implications are raised: If language cannot exhaustively capture the thinking process, how then are we to teach thinking and how do we learn to think?

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1 Within the scope of this paper, I refer to the English language as it is within the English language system that this paper is operating.
Cognitive Account of Thinking

Four concepts underlie experiments and inquiry in psychology as an empirical science: validity, reliability, falsifiability, and parsimony. Validity concerns whether differences in the measure of the dependent variable (phenomenon being observed or measured) are due to difference in the independent variable (phenomenon altered by the experimenter). Reliability points to whether results can be consistently achieved. Falsifiability is the possibility of a claim being refuted. Hypotheses in psychological experiments have to be falsifiable such that if the claim is false, the results of an experiment can show that it is false. Parsimony is the principle of Occam’s razor, meaning that the hypothesis with the fewest assumptions, and the one that can offer the simplest explanation, is the preferred one. Psychologists construct experiments with these four concepts in mind, trying to achieve high validity and reliability and have their hypotheses be falsifiable and parsimonious. They also utilize statistical tools to help make correlations, to establish causal relations, and to gain scientific knowledge.

Another important concept in psychological empirical research is operationalization, which means that concepts, especially unclear ones like justice, fear, or intelligence, are defined in terms of operations that can be measured so that they can be studied. The scientist who coined the term operational definition is Percy Williams Bridgman who writes, “nothing can have physical reality unless it is subject to experiment, which means usually that it must be measurable” (as cited in Moyer, 1991, p. 376). For example, “fear” is a fuzzy and unclear concept that could mean a variety of things to different people. One way of operationalizing the concept of fear is to measure heart rate and the amount of sweat on the subject’s palms in response to a stimulus. These data allow for internal emotional and/or physiological states to be observed, measured, and analyzed. However, fear is not only physically manifested in heart rate and sweat; fear might manifest in other physiological responses or mental states. Moreover, this operational definition of fear does not answer what fear is as a mental state. It does not shed light on why we fear, nor does it say what kind of fear it is that is being measured—a fear of ghosts, of spiders, or of other people, for instance.

To use an example that pertains more closely to an educational setting, intelligence has been operationalized in several ways. For example, IQ tests like the Stanford-Binet tests and the Wechsler Intelligence Scale for Children are one way to measure intelligence, despite the problems with the tests and scales themselves and ways of interpreting the scores. These tests rely heavily on language, broadly defined as general social codes for communication including written language, oral speech, numerals, and even geometrical shapes. Still, abstract concepts such as intelligence constructs are made concrete and measurable by operationalizing them. Even if the intelligence constructs are not operationalized into a language-based task, the experimenter likely still uses oral language in his/her explanation of them. In turn, through operationalization, abstract concepts can be observed, measured, and understood. This way of conceiving reality—that things are only real if they are subject to

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2 Philosophers of science such as Karl Popper and Thomas Kuhn have contributed greatly to this field, which is concerned with the methods and merits of science. See also introductory psychology textbooks such as *Research Methods and Statistics in Psychology* (Coolican, 2013) and *Introduction to Psychology* (Plotnik & Kouyoumdjian, 2011).
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experiment—has significantly shaped the way the mind is conceptualized by the scientific community today. Consequently, it has also affected the way cognition and thinking is conceived and characterized in an educational setting.

According to empirical psychologists, behaviours and processes of the human mind are best studied when they can be operationalized into observable and measurable instances, whether they are in the form of a heart rate or a pencil-and-paper test that measures intelligence. In particular, behavioural psychology emphasizes the study of only outwardly observable behaviours. While the cognitive revolution in psychology beginning in the 1970s brought about a change in academic psychological research, attempts at operationalizing the mind and its processes remain prominent. While behaviourist theories failed to fully address cognitive processes such as memory, perception, and language, cognitive psychology has been able to utilize computer technology to model the mind, and is thus able to both quantitatively and qualitatively study the mind. The use of computers to recreate processes of the mind “has made the mind respectable again as an object of scientific study” (Frosh, 1989, p. 12), but the underlying implication is that the mind is the product of the brain—the hardware of the computer that allows for the software to run.

One way to study the mind would be to study the “hardware,” such as the brain and genetics. Another way to study the mind, as most developmental cognitive psychologists do, is to gain an understanding of the “software”—the processes and the phenomena. Stephen Frosh describes the general movement in cognitive psychology as attempts to come up with, and subsequently test, models of how cognition works. Frosh (1989) gives the example of how research in memory works:

Memory research therefore consists of three linked processes: descriptions of what happens when people remember and forget things..., construction of abstract models which summarizes these descriptions and presents hypothesis concerning the type of operations that the system must be capable of..., and experimental testing of the accuracy of these models. (p. 13)

What cognitive research does is descriptive: “it is the descriptive understanding that answers the question, ‘What does this system look like and how does it work?’… [B]ut it makes no comment on its semantics, the meanings that the system generates or incorporates” (Frosh, 1989, p. 14).

Considering these issues, the way cognitive psychology views thinking and cognition lacks an important semantic element that answers the question of why humans remember, for example, and not just how we remember. Empirical and experimental ways of conceptualizing thinking and cognition as observable and measurable have affected the way thinking is conceived. In the educational setting, firstly, thinking becomes something measurable and observable, such that it is possible to devise tests to measure students’ thinking or growth in their ability to think. Second, thinking becomes something that can be taught, whether as a stand-alone skill or as a skill that is incorporated into subject matter. Most importantly, and inherent in the last two points, thinking becomes reducible in language. The use of language in pencil-and-paper tests, and the use of language as the dominant mode of communication in teaching students
how to think, is problematic. Overemphasis on the relationship between language and thought leaves out an element of thought that is not captured by language. The idea that thinking is more than language is perhaps more akin to what Heidegger calls meditative thinking, which is discussed in a later section of this paper.

Empirical studies do have an important role in an account of what thinking is, how we think, and why we think. However, there are limitations to an empirical account of thinking and significant advantages in considering a more interpretive and hermeneutic account of thinking. This paper aims to note a specific problem in an empirical account of thinking: I am attempting to show that language does not and cannot comprehensively encapsulate thought and the thinking process. And by pointing out the limitation of operationalization of thinking through language, it does not preclude other experimental research designs, either in ways of collecting data or non-experimental research designs. Other ways of collecting data include neuro-imaging and other physiological responses. However, the question remains whether thinking can be operationalized and thus observed and measured by those operations, and whether those operational definitions actually point to thinking. My focus on the use of language in accounting for thinking affects the pedagogy of thinking—if thinking cannot be exhaustively conveyed through language, then thinking can neither be exhaustively taught nor learned through language. Inevitably, in an attempt to teach thinking through language (whether oral or written), something escapes. How then are we to teach thinking and how do we learn to think?

Having presented a brief account of experimental psychology, I hope that the major assumptions, and the problematics, of empirical experimental science that underlie psychology have become clearer. The insistence of operationalization can lead to a reductive account of thinking and cognition, especially in educational psychology, where concepts like intelligence are reduced to tests and questionnaires. In the sections that follow, I will explain why language cannot comprehensively describe thinking, and why thinking is irreducible to language. Then, in pointing out the pedagogical implications of thinking’s irreducibility to language, I describe an alternative way of thinking about thinking through Heidegger’s concept of calculative and meditative thinking.

**Language and Thought**

As mentioned above, I define language as a generally accepted social code that allows for communication. It can include written language, oral speech, numerals, and shapes. That language is a tool for expression and communication implies first that there is a subject who utilizes this tool, and at least one other subject who knows and uses the same tool for communication and expression. Cognitive developmental psychologists partly devote their research to language acquisition; “acquisition” implies that infants are not born with language, but are born with a capacity to acquire language. Without language, infants communicate differently. Newborns cry to convey states of hunger or pain. Moreover,

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3 Hermeneutics is the study of meaning, interpretations, and communication. An interpretive and hermeneutical account of thinking would be mindful of meaning in thought and a more philosophical way of considering thinking as cognition.

4 Philosopher Paul Feyerabend (1987), for example, has critiqued scientific methodology and proposed an anarchistic view of science.

5 However, the irony is that I will attempt to do so using language.
newborns “produce nondistress vocalizations, which serve as social signals that elicit contingent responses from parents and promote further interactions” (Gross, 2008, p. 255). Undoubtedly, on some level even newborns think and develop rapidly in their cognitive abilities. They can do so without language. Even as adults, I argue, there are experiences that are indescribable by language, at least not exhaustively, such that language is not a comprehensive tool for expression. In the following section, I will provide the foundation of conceptualizing language as an expressive tool for communication, and show its arbitrariness through the work of the linguist Ferdinand de Saussure. I will subsequently outline a psychoanalytic account of language and thought in infancy to show that objects can be symbolized prior to language and the positive relation between the symbolization of objects and thought.

Saussure (1916/2001) defines language as “a social institution … a system of signs that express ideas, and is therefore comparable to a system of writing” (p. 961). A sign links what Saussure calls the signifier (sound-image) with the signified (concept). Most importantly, however, “the bond between the signifier an the signified is arbitrary…I can simply say: the linguistic sign is arbitrary” (Saussure, 1916/2001, p. 964, italics original). Saussure’s most famous example of arbor exemplifies the arbitrariness of the linguistic sign. “Arbor” does not capture the essence of the concept of a tree, nor does it have anything to say about trees that are just outside one’s window. “Arbor,” or “tree,” or a picture of a tree simply points towards the concept of trees, without any divine meaning behind it. What Saussure (1916/2001) means by arbitrary is not that one can just make up a signifier for tree or any other signified concept, but that the signifier “is unmotivated, i.e. arbitrary in that it actually has no natural connection with the signified” (p. 965). The connection between a signified and a signifier is relational but language only arbitrarily lines up with the representation of the world. In other words, language only serves to restructure our experiences in the world, and does not structure it. Saussure’s theory is partly a reaction against sacramental theories of language like that of Augustine of Hippo and St. Thomas Aquinas, who write that just as man is created in the likeness of God, the word of man is in likeness of the Word of God or scripture. Saussure’s linguistic theory posits language as non-essential, and a systematic tool that restructures the world and rearticulates it for better understanding.

One way to interpret Saussure’s argument that language is arbitrary and non-essential is that the world exists outside of language and that language is imposed upon the world by humans for ease of communication and understanding. An infant learns a language with rules that predate the infant’s existence—for example, right now, we are speaking English prior to the next baby who will learn to speak English. This means that “the site of language is not in the consciousness of each individual; rather, the individual is subjected to language, which exists as a system outside her or him, into which she or he is incorporated” (Frosh, 1989, p. 144). Language, in this view, does not generate meaning in itself; it becomes meaningful only when used by someone. At the same time, it is important to account for language also as something that socializes the infant into a community, as something that helps shape the development of individuality by gaining the ability to express and convey oneself and to understand others. The notion that language is external to consciousness and subjectivity from the moment we are born

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allows the possibility for humans to have a relationship with the world and its objects that is outside of language—pre-linguistically as newborns, and symbolically as adults.

As psychoanalyst Melanie Klein (1957/1975) states, language is an inadequate means of expressing pre-linguistic experiences, and an infant’s unconscious phantasies are “felt by the infant in much more primitive ways than language can express” (p. 180). Here, I take Klein’s use of “primitive” not to mean savage but primitive in comparison to language, which has elaborate rules and syntax to be followed in order to generate meaning. For Klein, prior to the acquisition of language, infants are motivated to symbolize objects due to “early anxiety caused by the child’s own destructive impulses, which are defensively projected on to an external object” (Frosh, 1989, p. 136). Infants come to choose objects in the environment that serve as symbolic substitutions for primal objects, such as breasts and penises that are experienced by the body concretely without abstractions. Consequently, there is a wholly positive relation between the object symbolized and the symbol—a certain object comes to symbolize breasts for an infant due to concrete resemblance. On the other hand, returning to Saussure’s notion of the arbitrariness of signs, there is a negative relation between the signifier and the signified such that “arbor” signifies a tree, not due to its resemblance to a tree, but in its difference in relation to other words.

This brief discussion of Saussure’s linguistic theory and psychoanalytic symbolization highlights two points. First of all, regarding the relationship between symbolization and thinking, I believe that even in infancy, infants have a capacity for thinking and symbolization. In order to substitute a primal object with a symbol, several cognitive processes are at play, even if they are unconscious, including the perception to perceive concrete resemblance, the categorization of similarities and differences in objects, the abstraction from primal objects to symbols (not experienced concretely), and the memory to retain the relationship between the symbol and the object for later retrieval. The fact that these processes are unconscious suggests that cognitive processes cannot be reduced to language because there is an unconscious element inherent in them.

Secondly, Saussure’s linguistic theory and a psychoanalytic conception of symbolization point to the difference between a positive relation and a negative relation in language or symbolic representation and thought. Recall Klein’s suggestion that pre-linguistic experiences cannot be adequately described by language. This proposition suggests that the negative relation between the signifier and the signified fails to capture pre-linguistic experiences (such as the symbolic representation of primal objects), because those experiences are structured differently than language. By broadening definitions of thinking to include unconscious cognitive processes, I argue that language does not structure all experiences and cognitive processes and that it will be unable to capture all of it. Rather than relating directly to objects as in symbolization, in language, signifiers relate indirectly and negatively, adding the use of rules and syntax. Sigmund Freud also suggests “a dual notion of the relationship between language and the unconscious” such that “[l]anguage both expresses the symbolism of the unconscious and is the means of unravelling it.” (Frosh, 1989, p. 135–136) Human experiences, then, including cognition and thinking, cannot be exhaustively described using language because of its fundamental differences to the structuring of pre-linguistic experiences and cognition. However, language is also what we use in order to make sense of experiences
indescribable by language, for we are socialized into using language and language undoubtedly plays a role in shaping our individuality.  

Calculative and Meditative Thinking

Here, it is appropriate to introduce Heidegger’s two conceptions of thinking—calculative thinking and meditative thinking—to offer a way to conceptualize thinking as a cognitive, yet hermeneutical, phenomenon. First, Heidegger conceptualizes thinking as “not only experimental, in search of solutions, but interpretive, in search of meaning” (Fairfield, 2009, p. 128). This conceptualization of thinking already presents itself as extremely different from the definition of critical thinking that focuses on problem solving, mentioned in the beginning of this paper. Moreover, Heidegger is critical of “science’s totalizing pretensions…, including the naïve overestimation of its ability to know the world…” (Fairfield, 2009, p. 130). Heidegger’s critique of science runs parallel to my critique of empirical experimental psychology as a science; his account of the limitation of the sciences and the scientific method is also congruent with the limitations of language in analyzing, teaching, and learning thinking that I articulate. His distinction between calculative thinking and meditative thinking also loosely aligns with what I conceptualize as the aspect of thinking that can be taught through language and the aspect of it that is irreducible to language.

In his work “What is Called Thinking?”, philosopher of education Paul Fairfield (2009) offers the following definitions for Martin Heidegger’s idea of calculative thought:

Calculative thought… plans, manipulates, and predicts with a view of ultimately to achieving a kind of mastery over everything that is, including human beings… Calculative rationality deduces and plans while understanding neither its limits nor the meaning of its object nor the very act of calculation itself. … [C]alculative thought is governed by a method that in principle anyone can follow and repeat… (p. 131)

Calculative thinking is not concerned with understanding the object of its thought, similar to the way in which cognitive psychology does not aim to answer the “why” of thinking but only describes the “how.” This kind of thinking generates some kind of knowledge, but lacks meaning and is uncritical of itself.

It is Heidegger’s meditative thinking that corresponds more closely to what I see as the indescribable aspect of thinking. Meditative thought is concerned with interpretation and meaning of the object of its study:

Meditative thinking, by contrast, seeks depth of understanding over certainty… It follows no method and requires no special expertise… It is a mode of thought that produces no certainty, employs no technique, and gets no results apart from the understanding that it makes possible. … The

7 This concept is later developed in Lacanian psychoanalysis. See Lacan (2006) by Slavoj Žižek and a selection from Modern Literary Theory: A Reader (1989).
point rather is to understand, to grasp a meaning that is singular and unrepeatable. (Fairfield, 2009, p. 132)

Heidegger also employs concepts such as mystery and wonder throughout his works to demonstrate aspects of thinking and experience that are outside the reach of the scientific model. From Heidegger’s notion of meditative thinking, Paul Fairfield (2009) concludes that “thinking is an art. No scientific or logical model, whether [John] Dewey’s or more recent ones, can capture the complexity of human knowing and understanding” (p. 140). I agree with Fairfield’s view that thinking should be understood as an art rather than a science.

Heidegger’s distinction between calculative and meditative thought\(^8\) seems like the perfect description for the contrast between an experimental psychological account of thinking and acknowledge that thought cannot be exhaustively reduced to language. However, I did not introduce Heidegger’s ideas earlier in structuring my account of the irreducibility of thought to language for two reasons. First of all, I want to escape the binary between calculative and meditative thought that Heidegger’s conceptions may suggest. Moreover, there is a fundamental difference between my argument that thought cannot be reduced to language and the relationship Heidegger sees between language and thought. Above, I have argued that pre-linguistic experiences and cognition are possible and that language is a tool that humans are socialized into using to generate and convey meaning. However, Heidegger (1968/2008) believes that language has an important role in making reality possible and also making thought possible: “And only when man speaks, does he think – not the other way around” (p. 381). On the other hand, I am inclined to think that human beings first think without speaking, in line with the psychoanalytic argument of pre-linguistic symbolization presented above, and then learn to speak in their thinking.

Heidegger’s linguistic theory differs quite dramatically from that of Saussure’s outlined above. In his essay, “Language,” Heidegger (1971/2001) proposes the view that speaking as expression “already presupposes the idea of something internal that utters or externalizes itself” (p. 1123). It assumes that there is something, whether it is a soul, a God-given ability, or “some special volition” (Heidegger, 1971/2001, p. 1121), inside of human beings that prompts us to speak and express ourselves. However, Heidegger (1971/2001) has already made it clear that “we do not wish to ground language in something else that is not language itself” (p. 1122). And so, Heidegger’s theory of speaking and language would not be able to stand alone, as it is not grounded in language. Language is not just a tool for communication and expression; rather, “man [sic] speaks in that he responds to language” (Heidegger, 1971/2001, p. 1134). For Heidegger, language plays a role in calling everything into a conscious existence for humans. This difference in the role language plays in shaping reality and the world is why I was reluctant to utilize Heidegger’s thoughts in structuring my own argument.

Thus far I have outlined one difficulty in the teaching of thinking, namely that if thinking is irreducible to language, it is also not comprehensively teachable through language. However, another difficulty arises as well: if thinking cannot be adequately taught through language, how does one learn to think? Heidegger (1968/2008) writes that

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\(^8\) See Heidegger’s *Discourse on Thinking* (1966) for a more comprehensive understanding of the philosopher’s explication of thinking.
“we can learn thinking only if we radically unlearn what thinking has been traditionally” (p. 374). Therefore, by analyzing and studying thinking, we can also gain insight into what the learning of thinking might entail.

**Pedagogical Problems**

The inadequacy of language in describing all experiences and cognitive processes leads to a pedagogical problem in the teaching of thinking. Language is the tool we use to communicate with one another; it is used in classrooms by teachers and students. If language cannot capture all aspects of thinking, then attempts to talk about and write about thinking are doomed to be missing a piece of the process. How, then, can teachers thoroughly teach thinking? The general assumption is that thinking can be taught, either as a stand-alone problem-solving skill or integrated through subject matter. However, this question also deserves to be explored and studied. A more refined statement would be to say that the kind of thinking that *is* structured in language *can* be taught through language. I am not claiming that thinking cannot be taught at all through language, but educators should recognize the limitations of language in teaching. One only needs to look at the impossibility to teaching someone how to enjoy music through words and words alone, or the difficulty in describing, through words, a piece of music to someone who is hard of hearing.

Other pedagogical problems that arise and must be explored include the relationship between art, music, and thinking. What are instances of thinking when expressing oneself through the fine arts? Dancing, body movements, and music can convey powerful ideas without using oral or written language, or even abstract symbols. Is it possible to teach thinking through the fine arts, and would it be precisely the kind of thinking not captured exhaustively through language? Moreover, as I noted in the very beginning of this paper, this paper is operating within the English language system; this means that the claims and statements made in this paper about thinking and language are not universal; rather, they are specific to the context of the English language. Research efforts can also be devoted into, for example, the universality and specificity of Saussure’s linguistic theory discussed above.

**Conclusion**

The aim of this paper has been to point out the limitations of an experimental, empirical, psychological way of studying thinking that attempts to operationalize thinking into measurable and observable terms. However, by showing the nature of language as a negative relation between signifier and signified and the capability of pre-linguistic cognition during infancy and possibly maintained throughout adulthood, I have demonstrated that there is an aspect of thinking that is irreducible to language – one way, not the only way, of operationalizing thinking. The suggestion that thinking cannot be reduced to language implies that the teaching of thinking is not comprehensively possible, given that language is used as the most dominant mode of lesson delivery and communication between teachers and students. Further research is necessary to articulate the indescribable aspects of thinking, even though ironically, it might be done through language. Research on the irreducible aspect of thinking can also look into what it means
to learn to think—whether thinking is learnable or what ways of learning, without language, are appropriate.

References


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