# Epistemological Attitudes Towards Sources of Knowledge Semantic Questionnaire[*]

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Given the everlasting significance of knowledge in society and academia, this article proposes a theoretical and methodological perspective on conceptualizing and investigating it. Specifically, it aims to explore the epistemological attitude (EA) theory and its semantic approach to assessing sources of knowledge. The article provides a concise overview of the EA theory, which advocates for a systemic perspective on cognition and knowledge. It introduces and elaborates on the core concept and model, which serve as the foundation for the proposed methodology. This methodology suggests examining knowledge objects through subjective, contextual, and epistemological realms as multi-level knowledge constructs. Emphasizing the importance of semantics in studying knowledge, categories, and meanings, the article proposes an epistemological attitude towards sources of knowledge semantic questionnaire. The article delves into the methodology, reflecting on its four consecutive stages. It begins with the formal and substantive stages, which involve selecting sources, choosing academic experts as target participants, and developing content. The procedural stage follows, in which an expert review approach is employed to assess the content validity of the method. Finally, the article discusses the semantic method, elucidating its structure, features, semantic categories, and assessment procedure. The proposed method provides a unique contribution by enabling the analysis of the epistemological and socio-psychological meanings of sources, representing them as semantic constructs.

*Keywords:* epistemological attitude, sources of knowledge, semantic methodology, content validity index, university academics

## Introduction

Epistemology is a branch of philosophy in which the main problem scope is cognition and knowledge (Audi, 2010). Within the current informational paradigm, epistemological issues are of great importance in interdisciplinary social sciences and humanities. Their theories address the problematic aspects and contextual dimensions that center on investigating social and psychological phenomena related to cognition and knowledge in various spheres. The most notable theories are epistemic authority (Zagzebski, 2014; Jäger, 2015), epistemological beliefs (Schommer-Aikins, 2004; Hofer & Pintrich, 2002), epistemic beliefs (Muis & Franco, 2009), epistemological world views (Olafson, Schraw, & Veldt, 2010), epistemological reflection (Magolda,

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2004), epistemological thinking (Kuhn & Weinstock, 2002; Barzilai & Zohar, 2014), epistemological understanding (Kuhn & Park, 2005), epistemic cognition (Chinn, Buckland, & Samarapungavan, 2011), reflective judgement (King & Kitchener, 1994), epistemic climate (Feucht, 2010) and many others.

These concepts recognize the multidimensional and complex nature of individuals' intra-concepts. The Latin prefix *intra* signifies "inside" or "within" (Oxford Latin Dictionary, 1968), denoting the mental, subjective and psychological nature of phenomena that individuals possess. The authors of these concepts propose and describe their structure, dimensions, and relation to a specific subject areas and contexts.

There is also an intention to go beyond intraindividual to the inter-realm (Klopp & Stark, 2023), originating from the Latin prefix *inter* signifying "between" and "connected" (Oxford Latin Dictionary, 1968). For instance, the concept of epistemic resources and framing (Elby & Hammer, 2010) is intended to connect the psychological aspect to the context, which activates specific knowledge and resources of individuals' subjective being in response to correspond to inquiry. Another concept that goes beyond psychological existence is the concept of epistemic decentring (Hagège, 2023), which is grounded on the three levels of the epistemic dimension (Hagège, 2019). This framework suggests that knowledge is reflected in both the context and the mind, resulting in three levels: the content of what one knows, their beliefs about what they know, and identification with that knowledge what they know.

The concepts mentioned above hold particular importance in academic, educational, and scientific fields. Interdisciplinary scholars are actively conducting and advancing research related to epistemological issues. They aim to develop theories and research methods and apply existing ones to examine individuals' understanding, cognitive approaches, beliefs, attitudes, opinions, views, positions, and dispositions towards various aspects of learning, teaching, and scientific research.

Nevertheless, we posit that the conceptualization of cognition entails not only a dimensional perspective but also a systems approach. The systems approach is a methodology that unifies different dimensions through systems principles (Vorobjovs, 1997). Also, in knowledge research, epistemology is to be a primary conceptual framework. This framework should encompass a holistic understanding that considers an individual's psychology or intra-realm, the situation and context of cognition or inter-realm, and the role of knowledge as the a priori paradigm in which cognition occurs or meta-realm. The term "meta-realm" is derived from the Greek word *meta*, meaning "beyond" or "above" (Angeles, 1992).

We suggest the theory of cognition in the holistic constructive perspective, known as the epistemological attitude (EA) theory (Sivoronova & Vorobjovs, 2022). This theory postulates cognition as a complex system in which elements functioning as a sub-system can be examined as a multi-level form of knowledge. This shift in focus allows us to examine phenomena of the cognition system rather than individuals' phenomena. Additionally, the system principle applied to cognition states that any of its phenomena reflects the entire system (Wertheimer, 1945/2020; Ellis, 1938/2013).

Proposing a systemic framework, it is necessary to have a method for evaluating the multi-level qualities of knowledge. It is essential to identify units that can capture different levels, and these units are commonly known as meanings. Meanings refer to the way the mind processes and connects concepts, objects, or phenomena. It represents the mental representation of these connections (Fodor, 1987).

Meanings suppose different levels of complexity (Kelly, 1963/2002). Therefore, this fundamentally underscores the complex interconnections of systems and the formation of meaning. As such, meanings are inherently systemic; hence, they allow for incorporating a systemic framework. Meanings are systemic as they,

being knowledge, reflect connections with the subject (an active agent or individual) through connotations. They also reflect connections with objects through denotations and connections with themselves being "thing-in-itself" (Kant, 1781/1998) or as knowledge about knowledge (Frege, 1948; Bell, 1991).

The methodology used to investigate meanings is known as semantic. Semantic approach, method and analysis are used to investigate meanings of knowledge, phrases, representations of objects, and categories (Petrenko & Mitina, 2014; Osgood, May, & Miron, 1975). The specific approach that investigates the meanings of consciousness is referred to as psychosomatics (Fodor, 1987; Petrenko & Suprun, 2015). Psychosomatics aligns with the systems framework and acknowledges multiple connections, as it embraces constructivism and interpreting knowledge at various levels. In the context of studying semantics or meanings, it is essential to understand that they represent the consciousness's interactions with objects, simultaneously reflecting multiple levels of knowledge that encompass information about all engaged systems.

Within the realm of studying cognition and knowledge, our primary consideration is given to knowledge sources, as they provide a window into both the process of knowing and the content of knowledge. Furthermore, the existing informational paradigm presents both opportunities and challenges to cognition, providing a variety of knowledge sources that can be scrutinized in terms of their potential and characteristics. By knowledge sources, we are specifically referring to theory-based and practically derived knowledge of instruction (Bråten & Ferguson, 2015). These sources can be formal or informal, scientific, social, or traditional knowledge held by individuals or groups. They are typically memorized and reproduced in different forms in specific ways to provide for any inquiry. Knowledge sources can be classified into various forms, including formalized, social and popular media, and experimental or research-based. Formalized knowledge sources consist of formal education, such as teacher education and lecturers' knowledge, which are imparted in educational institutions (Shulman, 1987; Buehl & Fives, 2009; Schraw, Brownlee, Olafson, & Brye, 2017). Other formalized sources include textbooks, handbooks, academic writing, scientific articles, monographs, and professional literature (Mārtinsone & Pipere, 2019; Aharony, 2010). Acknowledged scientific websites and databases (e.g., Scopus, Web of Science, PubMed, ERIH, EBSCO, Directory of Open Access Journal, APA PsycNet, and others similar between important ones), as well as educational websites, also serve as sources of formalized knowledge (Mārtinsone & Pipere, 2019; Shawar, 2015). The social, popular and professional forms of knowledge sources are social media platforms like LinkedIn, Twitter, Telegram, Facebook, Instagram, Reddit, YouTube and others (Bucher & Helmond, 2018). In addition, popular media such as popular science magazines and books, newspapers, broadcasting, radio, and podcasts are also mentioned (Brewer & Ley, 2021). Additionally, they highlight scholarly and professional social networks like ResearchGate, Academia, Kudos, Mendeley, PhilPapers, and similar platforms (White, 2014).

These knowledge sources provide uncomprehending information to make inquiries, research, knowledge acquisition, creation, and transfer. The question arises of who should be responsible for evaluating these sources. Experts in cognition, knowledge identification, recognition, and evaluation should take on this role. Scholars who are experts in academia, possess the capacity to contribute their expertise in a multitude of fields and access a broad array of sources, spanning scientific and non-scientific disciplines.

This article proposes a methodology based on five issues and assumptions: the need for a system perspective, the EA model, psychosomatic methodology, knowledge source variety, and expertise in evaluation. This methodology aims to investigate how individuals perceive and reflect knowledge in their consciousness. By doing so, it seeks to understand knowledge sources as constructs of multi-level knowledge.

The article is organized into five sections. Section two delves into the theoretical background of the EA model. Section three describes the development and details of the method. Section four includes discussions and suggestions for future research.

## Foundations of Epistemological Attitude Theory

We present the epistemological attitude (EA) theory as a novel perspective in the holistic constructivism paradigm. This theory aims to enhance our understanding of cognition (Sivoronova & Vorobjovs, 2022). Holistic constructivism combines co-ontology, constructivism, and three levels of methodology to model complex systems like cognition. The three-level methodology consists of three steps in theoretical modeling, which aim to derive the postulates and principles of cognition. These three levels are philosophical, general scientific, and specific scientific methodologies.

In the *philosophical methodology*, our understanding of cognition is rooted in the postulate of co-ontology. Co-ontology involves three forms of being: subjective (Kant, 1788/2012; Fichte, 1794/1982), objective (Bhaskar, 2013; Hartmann, 1935/2019) and transcendental (Plato, 2004; Kant, 1781/1998). This implies that cognition is a manifestation of being, assuming the coexistence of subjective, objective, and transcendental realms. The subjective realm refers to individual beings, the objective realm refers to tangible and social reality, and the transcendental realm refers to knowledge. The term "transcendental" is related to Kant's transcendental idealism philosophy, denoting the prior role of knowledge. Thus, transcendental explanations are used as a principle to derive other principles (a priori knowledge) (Kant, 1781/1998). Also, by transcendental we mean philosophical knowledge that encompasses all possible knowledge and ways of cognition and actions from all time perspectives. The last interpretation is obtained from the term's origin. The term "transcendental" comes from Latin (transcendere; from *trans*, "across", "over", "beyond"; and *scandere*, "climb") and means something superior and beyond what is given to our experience and scientific explanation. It is both independent and separate (Angeles, 1992).

Following the holistic principle that all forms of being are interconnected and knowledge has a priori status, we incorporate principles from epistemological realism and constructive epistemology (Lektorskii, 2010; Lektorsky, 2018; Putnam, 1979; Lenk, 2003; Popper, 1979; Lakatos, 1980; Rockmore, 2005). These principles assume that cognition, when defined as construction, and knowledge, when conceptualized as constructs, are manifestations of being. They also suggest that all forms of being can be conditionally reflected as knowledge. In addition, we incorporate the principles of social epistemology (Goldman, 1986; Fuller, 2000) to reflect the nature of the objective and social realm as a result of social cognition and existence. We also utilize the principles of constructivism (Butts & Brown, 2012) to explain the existence of the subject. Firstly, these principles view any activity as processes and constructions. Secondly, the subject's consciousness and external reality are considered as "things for us" (Kant, 1781/1998), thus constituting knowledge. To establish a connection between the subjective and transcendental realms, we employ the principles of phenomenology (Husserl, 1913/1983) by establishing multiple levels of the subject's activity and consciousness.

The cognition system is proposed, adhering to the mentioned principles. This system is defined by the relationships between its elements. The subject, reality, and knowledge are considered the main components of cognition. The concept of relation holds a philosophical significance and can manifest in various forms. Ontologically, relation represents a form of being and how elements coexist (Aristotle, 2006). Epistemologically, relation serves as a form of cognition and knowledge (Kant, 1781/1998). Methodologically,

it can be expressed through action, interaction, attitude, and mechanism (Gabriel, 2011; Borchert, 2006; Piatigorsky, 2002/2016).

Within *the general scientific methodology*, we apply the system principle to model the cognition system and determine its main functional and substantive aspects. The system principle is one of the leading general principles, along with structure, holism, and synergy (Vorobjovs, 1997), that are used in theoretical modeling. The system principle is acknowledged in both philosophy and science. In philosophy, the cognition system is regarded as fundamental and is utilized in various philosophical approaches and conceptions. Edmund Husserl's system of relations, which explores the connection between the subject of experience, the object or reality, and transcendental consciousness in a phenomenological sense (Husserl, 1913/1983), aligns conceptually with our understanding of cognition. Georg Hegel's system of relations between the subject, the object, and self-consciousness or knowledge (Hegel, 1807/2018) emphasizes the role of the system principle in the development and functioning of cognition and knowledge. This system also corresponds to our comprehension. In science, contemporary philosophy, and philosophy of science, there are many prominent systems specific to their subject of study. In sociology, the theory of structuration (Giddens, 1984) views the subject and social action as having systemic functioning in society. The theory of social action (Parsons, 1937/1968) focuses on the postulate of the realm of action systems, where every agent's action is the product of interaction within cultural and social relationships. Luhmann's systems theory (1995) views society as a whole, with communication principles governing the interactions between agents and sub-systems, including environmental, biological, and cultural elements. Additionally, the theory of communicative action (Habermas, 1984) emphasizes the systems process that stabilizes actions, communication, and different societal structures. In contemporary philosophy, systems of knowledge are linked to individual and social consciousness, thinking patterns (language and culture), and different forms of knowledge (Foucault, 1970). Similarly, in the sociology of knowledge, the theory of habitus (Bourdieu, 1969) argues that all knowledge is located within the system ("intellectual fields"), and the meaning of knowledge depends on its relation to the system ("field") as a whole. In the field of linguistics, the semiotic theory (de Saussure, 2011) posits that signs acquire meanings within a system of structural patterns. Initially, these patterns are based on the relationship between the sign and what it signifies, as determined by an agent. The system principle extends beyond linguistics and finds application in various scientific disciplines such as information theory, cybernetics, and humanities like history and literature (Arnold, 2013). In physics and mathematics, systems play a fundamental methodological role in explaining phenomena and processes of other systems (von Bertalanffy, 1950; Hermann, 1973; Témam, 1997). Within the philosophy of science, a radical holistic strategy is employed to describe and explain phenomena at the macro-level using terms from that level or even higher levels while refraining from relying on lower-level theories (Kuipers, 2007). Systems serve as the foundations of logic, methodology, scientific discovery, and theories (Boyd, Gasper, & Trout, 1991). These examples emphasize that various scientific realms utilize different systems, yet they all share a common general systems methodology, which we also employ.

When developing the cognition system, we adhere to the system principle, specifically incorporating systems philosophy (Laszlo, 1972/2021), systems approach (Blauberg, Sadovsky, & Yudin, 1980; Churchman, 1968/1979) and specific systems principles (von Bertalanffy, 1968/2003; Nardelli, 2022; Mattessich, 2012). According to these foundations, cognition is seen as a system consisting of elements that are sub-systems organized based on their relationships. The functioning and development of the cognition system are determined by self-organization. The system employs organizational mechanisms to translate different forms of

knowledge, coordinate sub-systems, and make probabilistic predictions about behavior and actions. The sub-systems of the cognition system—the subject, reality, and knowledge—operate, develop, and change independently and spontaneously. Complementary and dialectic principles simultaneously maintain and alter the cognition system in its entirety. One critical principle is a systemic quality or the integrative property of the cognition system, which results from its ability to integrate elements and create a functioning whole. This integration leads to the emergence of new qualities which simultaneously encompass information about the entire system and denote specific relations. These qualities, known as cognition phenomena, are similar to the concept of "gestalt" in gestalt theory, which is used to reflect the results of relationships between systems of consciousness and the environment (Wertheimer, 1945/2020; Ellis, 1938/2013). Different cognition phenomena can manifest within the cognition system, one of which is the EA, appearing as a form of epistemological relation.

*The specific scientific methodology* is used to determine the conceptual apparatus of the epistemological relation. Specifying the epistemological relation as the EA is crucial to enable its future scientific modeling and investigation. The epistemological relation exists between the subject and object systems and can be traced back to ancient philosophy, where Socrates emphasized self-awareness and the cognition of oneself in opposition and relation to the external world. Descartes (1644/2018) further developed this concept, representing it as a fundamental form, position and occurrence of cognition. To derive the EA from epistemological relation as one of its manifestations, we encompass concepts, theories and their principles, methods, and procedures used in social science and humanities, focusing on the subject and its relations to the object to explain how the subject or individual acts, interact with object or entities of reality, acquire and create knowledge, and use and operate. These theories are based on subjective constructivism (Lewin, 1951/1967; 1967/2013; Piaget, 1972; Gibson, 1979/2014), social constructivism (Vygotsky, 1980; Berger & Luckmann, 1966/2011; Prawat, 1996), personal activity theories (Vygotsky, 1934/1986; Vorobjovs, 1997; Engeström, 1999), personalization theory (Petrovsky, 2013; Vorobjovs, 2005), principles of interactionism (Mead, 1938/1972; Habermas, 1984), pragmatism and functionalism (Dewey, 1916/2012; James, 1907/2000), gestalt theory (Wertheimer, 1945/2020), cognitive motivation (Lewin, 1967/2013) and contexts of cognition. According to these principles, we propose that the subject actively engages on different levels, including subjective, objective, social, and transcendental. This implies that all elements of the cognition system are equally and apodictically determined through their mutual interactions. Moreover, the core of the subject's activity resides in its principles, knowledge, and motivation. Therefore, the subject's general modes of cognition encompass interaction, action, and behavior with objects. As the subject's being, reality and knowledge possess distinct ontologies; the cognition system serves as the central principle for the coexistence of various ontologies. In the following sub-section, we define the EA, explain its role, and operationalize it through a model.

**Epistemological Attitude in the Cognition System: Concept and Model**

We propose the concept of the EA in researching a cognition phenomenon, specifically focusing on the interaction between individuals and specific objects. This concept explores the epistemological nature of the interaction, highlighting three important aspects. Firstly, we consider the role of knowledge in comprehending, describing, and explaining the phenomenon at different levels of understanding. Secondly, we recognize that the cognition phenomenon is not solely individual experiences but is part of the cognition system, thereby

pertaining to the object and the context of their interaction. Finally, we acknowledge that an attitude is a specific form of relation that is a widely recognized concept in scientific research, particularly in social science (Eagly & Chaiken, 1993; Hovland & Rosenberg, 1960; van den Berg, Manstead, van der Pligt, & Wigboldus, 2006; Fishbein & Ajzen, 2011; Maio & Haddock, 2009; Katz, 1960; Prentice, 1987; Pratkanis, Breckler, & Greenwald, 2014). Building upon these reflections, our suggestion posits the notion that the EA can contribute to a new conceptualization of attitude.

The EA is defined as the relation between the subject (an individual) and the object (entities within reality), which implements subjective or intra-, objective and social or inter-, and transcendental or meta-knowledge (Sivoronova & Vorobjovs, 2022). With its systemic quality status, it encompasses different forms along with their corresponding functions. The primary form encompasses knowledge that exists at multiple levels. Its phenomenological function establishes and integrates complex relationships between an individual, reality, and knowledge. The illustration in Figure 1a demonstrates that. The relation between the subject and the object (S-O) reflects their actual interaction. The "triangle" of schematic relations represents the EA as their interaction with the implemented three levels of knowledge (Sivoronova & Vorobjovs, 2024).
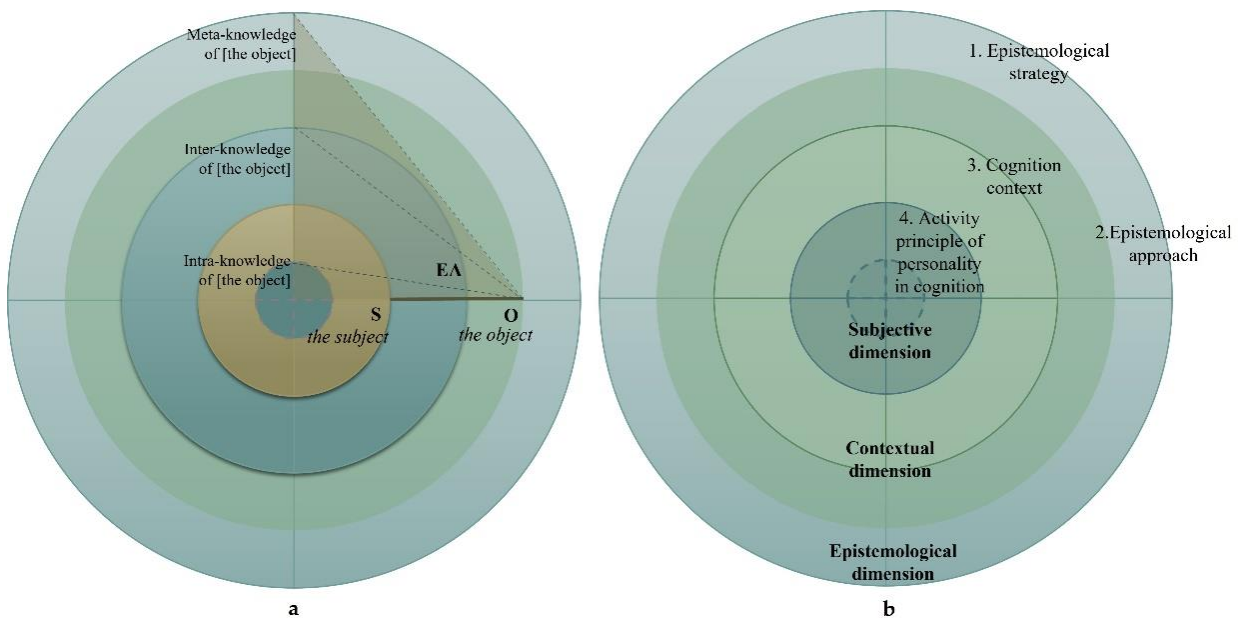


*Figure 1.* The epistemological attitude in the cognition system (a) and epistemological attitude towards sources of knowledge model (b) (adopted from Sivoronova & Vorobjovs, 2024).

The second form and function refer to a cognition mechanism that serves the purpose of providing and maintaining cognition. Moreover, it is useful for creating a model that represents cognition. This form reflects cognition as a process that occurs in three realms of knowledge: subjective, contextual, and epistemological, as depicted in Figure 1b. It uncovers the process and location of cognition during subject-object interaction, expressed as knowledge dimensions.

*The subjective dimension* encompasses an individual's psychological, biological, and social elements, which shape their being and actions. The knowledge implemented, obtained, and constructed within this dimension is subjective and depends on the individual's cognitive domain and personality traits. It is a

psychological reality. *The contextual dimension* expands the subjective dimension when an individual forms a connection with a specific object or relationship that arises spontaneously. It covers the realm where elements and events in reality are interconnected. The implemented knowledge refers to all the information that an individual has access to. This includes social knowledge (spontaneous and actual social knowledge, behavior), social objective knowledge (stable knowledge and behavior, culture), and scientific objective knowledge. *The epistemological dimension* is the realm of knowledge about reality, its objects, subjects, cognition, and existence. Its transcendental knowledge (philosophical and metaphysical knowledge) encompasses everything that can be mentally observed, understood, and acted upon, going beyond objective knowledge, which pertains to knowledge about knowledge itself and knowledge about all possible acts. It also explains where knowledge about the interaction object exists, not only in the present but also in the past and future (Sivoronova & Vorobjovs, 2023).

The third form is substantive, with its function being constructive. In this form, we have developed the EA as a specific cognition, which refers to the interaction between a defined subject and object. Consequently, the subjective, contextual, and epistemological dimensions are operationalized to define the model and develop the method according to the research aim of investigating academics' EAs towards sources of knowledge.

The purpose of operationalization is to represent each aspect of cognition based on theoretical principles while considering their unique features, content, functionality, and context. We introduce four concepts that recognize academics as active individuals who understand and engage with knowledge sources and determine the sources' characteristics and typical context of their interactions. In Figure 2b, four domains are presented: (1) epistemological strategy; (2) epistemological approach (both in the epistemological dimension); (3) context of cognition (in the contextual dimension); and (4) activity principle of personality in cognition (in the subjective dimension). Each concept is defined by its categories or features. This section defines the concepts, while a detailed description of sixteen features that explain these concepts can be found in the final section, where the methodology is explained.

*The epistemological strategy* represents an individual's general attitude towards cognizability and understanding of the world and cognitive potential of the knowledge source, including the reliability and predictability of their content. It is characterized by three features: optimism, skepticism, and agnosticism.

*The epistemological approach* refers to an individual's methods of formulating and resolving knowledge issues and the specific cognitive activity involved in understanding the sources. It is characterized by eight paired classical and four non-classical features: criticism and post-criticism; fundamentalism and normativism, and rejection of fundamentalism and normativism; subject-centrism and rejection of subject-centrism; science-centrism and rejection of science-centrism.

*The context of cognition* pertains to an individual's characteristics, frequency, and intensity of using the knowledge source and applying it in a specific context. It is characterized by two typical contexts in academics' cognition—academic and personal contexts.

The *activity principle of personality in cognition* refers to the driving forces and factors that determine how individuals interact with and use knowledge sources, including personality, motivation, and the value of knowledge. This concept is influenced by the theory of personalization, principles of personality activity, philosophical pragmatism and functionalism, and cognitive motivation theory. Three features, namely selection, homeostasis and reduction, are synthesized to characterize it (Sivoronova & Vorobjovs, 2024).

The EA allows us to focus on the subject, object, and interaction, shedding light on intra-, inter-, and meta-levels of knowledge. The EA model, tailored to specific knowledge objects, helps us develop a comprehensive understanding of these objects. Determining why and how individuals choose objects of cognition, how they interact with them, and their approach to knowledge represents the construct of the knowledge source within subjective, contextual, and epistemological dimensions. Based on the four-concept model, we have devised a method to semantically investigate knowledge sources, which we outline in the following section.

## Method Development

The method employed to study academics' epistemological attitudes (EAs) towards sources of knowledge involves administering a questionnaire. The development process included four stages: formal, substantive, procedural, and semantic. In the initial stage, two groups were identified: the sources of knowledge and academics who would evaluate these sources. University assistants, lecturers, senior lecturers, associate professors, professors, and researchers make up the academics. These individuals possess knowledge and expertise in various fields, making them capable of analyzing and assessing different sources of knowledge. The careful selection of sources of knowledge necessitates thoughtful deliberation regarding their importance in contemporary society and academia. Furthermore, the types of sources influence the criteria for evaluation and subsequently determine the elements of the methodology. The selected sources are grouped based on the previously highlighted general classification. Thus, we have chosen *a group of seven sources*: (1) scientific journal articles (both print and digital); (2) scientific monographs and books; (3) university lecturers' knowledge; (4) textbooks and handbooks; (5) popular science magazines and books; (6) academic social networks (e.g., ResearchGate, Academia, Common Ground Research, Kudos, Mendeley, PhilPapers and other similar scholarly media platforms); and (7) social media (e.g., LinkedIn, Twitter, Telegram, Facebook, Instagram, Reddit, YouTube and other social media platforms).

The substantive stage of method development involved the conceptualization of items and the development of rating scales. The method is designed as a structured questionnaire with defined statements, specifically closed-ended statements. There were two questionnaires involved in the method development process: an expert form for expert evaluation and a final form for academics to assess the sources. The description of the final form is provided in the last sub-section of the method. The expert form serves as a procedural phase form. It was comprised of an initial set of statements, consisting of 193 items, and accompanied by their theoretical framework, which incorporates the definition of 16 features of the EA four-concept (domain) model, utilizing a specialized 4-point Likert scale. In developing the statements, phenomenological and content analysis were used to define the concepts, with epistemological and psychosocial categories regarding the knowledge. The categories that could formulate the statements were then selected through content analysis. The formulated statements describe the sources of knowledge in general terms and can be used to evaluate any source from the list. These statements outline cognition, actions, and behavior related to the sources and their contents. The complexity of the items is contingent upon the respondent's academic and scientific competence and knowledge, which is determined by their scientific degree and affiliation with a university. The expert form was developed for the expert review implemented in the next stage, which included an empirical study and the analysis of results described in the following sub-section.

**Expert Review Method, Procedure and Results Analysis**

The procedural stage of the method development consisted of a three-phase process. The first two phases involved two rounds of the expert review. The third phase involved the development of the final set of items for the Epistemological Attitudes towards Sources of Knowledge Semantic Questionnaire (EASQ).

The first two phases relied on an empirical study utilizing the expert review approach. The expert approach is a methodology used to assess the content of the method. The material employed was the expert form that was developed in the previous stage, while the procedure utilized was an expert review method. The expert review method is a specific technique used for experts' evaluations. It determines the content validity of a developed method (Davis, 1992; Lynn, 1986; Beck & Gable, 2001). Content validity pertains to the capability of a method (or instrument) to accurately assess the attributes of the theoretical model. Content validity is measured by determining the extent to which the items of the method are relevant and representative of the intended theoretical model for a specific assessment purpose (Cook & Beckman, 2006; Haynes, Richard, & Kubany, 1995). The most commonly used expert review method for assessing content validity is the content validity index (CVI).

The expert review involved a group of seven subject matter experts with an average age of 53.4 years. This group consisted of three males and four females, who were professors, lecturers, and researchers with backgrounds in philosophy, psychology, methodology, and education. Five of the seven experts participated in the initial round of expert review, while two experts were involved in the subsequent round.

The process for the first round of expert review was as follows. Based on the CVI procedure, the experts assessed the relevance of 193 statements to the 16 features (scales) using a 4-point Likert scale. The scale ranged: 1 (not relevant), 2 (somewhat relevant), 3 (quite relevant), and 4 (highly relevant). To evaluate the CVI, three indices were used. The first index, known as the item-level (I-CVI), assessed the individual items of the method. The remaining two indices, referred to as the scale-level CVIs (S-CVIs), assessed the validity of the scales. These scale-level indices are based on the average method (S-CVI/Ave) and the universal agreement method (S-CVI/UA).

To calculate the I-CVI, the number of items rated as relevant or clear (rating 3 or 4) is divided by the total number of experts. The S-CVI/Ave is calculated by taking the average of the I-CVI scores for all the items on the scale. Alternatively, it can be calculated by taking the average of the proportion of relevance determined by all experts. The S-CVI/UA involves determining the proportion of scale items that receive a relevance rating of 3 or 4 from the experts. The universal agreement (UA) of 1 is given when the item receives an agreement from all experts; otherwise, the UA score is 0. The S-CVI/Ave is used to determine the most applicable items for a scale by optimizing consensus among experts during the evaluation phase (Davis, 1992; Lynn, 1986; Polit, Beck, & Owen, 2007; Yusoff, 2019).

The initial round aimed to evaluate and select items with appropriate indices for the second round of expert review. The evaluation of indices was followed by recommendations. According to the authors (Lynn, 1986; Polit et al., 2007), an I-CVI higher than 79% indicates the item's appropriateness, a value between 70% and 79% necessitates revision, and if the I-CVI falls below 70%, the item ought to be eliminated (Abdollahpour, Nedjat, Noroozian, & Majdzadeh, 2011). The adequacy of S-CVI/Ave indices is influenced by the number of experts involved. There is a correlation between higher indices and a decline in expert participation. A

minimum value of .8 is considered for an overall recommendation for S-CVI/Ave (Davis, 1992). The S-CVI/UA should reach a value of 1 when items with universal agreement are selected.

In the second phase of the procedural stage, we conducted a second round of expert review with two experts. One was a professor, and the other was a researcher, both specializing in psychology, epistemology, and methodology. The experts analyzed the results of the first round, evaluated the indices, and conducted a relational analysis to determine the importance of each statement regarding the indices and content. The results from the two-step procedural stage are shown in Table 1.

Table 1

*Content Validity Indices of the Expert Form and the Content of the Final Form of the Questionnaire*

| Scale | The initial set of items scale | I-CVI | S-CVI/Ave | S-CVI/UA | Items for revision | Eliminated items | Items for EAQ[*] | Added new items | Items for EASQ |
|---|---|---|---|---|---|---|---|---|---|
| Optimism | 11 | .6-1 | .85 | .55 | 0 | 3 | 6 | 3 | 5 |
| Skepticism | 12 | .6-1 | .85 | .64 | 0 | 3 | 6 | 2 | 5 |
| Agnosticism | 10 | .2-1 | .80 | .60 | 0 | 4 | 5 | 4 | 5 |
| Criticism | 12 | .2-1 | .70 | .42 | 3 | 3 | 6 | 3 | 6 |
| Post-criticism | 11 | .6-1 | .93 | .82 | 0 | 2 | 6 | 2 | 5 |
| Fundamentalism and normativism | 12 | .2-1 | .78 | .58 | 0 | 3 | 6 | 3 | 6 |
| Rejection of fundamentalism and normativism | 13 | .8-1 | .95 | .77 | 0 | 0 | 7 | 0 | 6 |
| Subject-centrism | 11 | .6-1 | .89 | .64 | 2 | 0 | 5 | 0 | 5 |
| Rejection of subject-centrism | 10 | .4-1 | .84 | .60 | 2 | 1 | 5 | 1 | 5 |
| Science-centrism | 13 | .6-1 | .91 | .62 | 1 | 0 | 7 | 0 | 6 |
| Rejection of science-centrism | 13 | .2-1 | .78 | .62 | 1 | 3 | 7 | 3 | 6 |
| Academic context | 14 | 1 | 1 | 1 | 0 | 0 | 7 | 0 | 7 |
| Personal context | 11 | 1 | 1 | 1 | 0 | 0 | 6 | 0 | 5 |
| Selection | 16 | 1 | 1 | 1 | 0 | 0 | 8 | 0 | 8 |
| Homeostasis | 13 | .8-1 | .95 | .77 | 0 | 0 | 6 | 0 | 7 |
| Reduction | 12 | .2-1 | .80 | .58 | 0 | 3 | 6 | 2 | 5 |

*Notes.* I-CVI, item-level content validity index; S-CVI/Ave, scale-level content validity index, averaging calculation method; S-CVI/UA, scale-level content validity index, universal agreement calculation method. EAQ[*] (Epistemological Attitude Questionnaire) is a non-semantic method using a classic Likert scale questionnaire, which is the subject of another study but is a part of the whole method development process.

The initial set of statements consisted of an average of 10 to 16 items in each of the 16 scales (features). During the first round of expert review, it was found that 11 out of the 16 scales had items that were deemed irrelevant based on the I-CVI. Nine of these 11 scales each had between one and four non-relevant items (with indices less than .7) that were identified and removed. For the "criticism" scale, three low-index items were eliminated, while three items with indices around .7 required revision. Additionally, one or two items from the scales of "subject-centrism", "rejection of subject-centrism", "science-centrism", and "rejection of science-centrism" were opted to undergo revision. With the exception of the "criticism" scale, all other scales showed appropriate and good indices in the analysis of S-CVI/Ave. The S-CVI/UA indices indicated unanimous agreement from the experts on at least 50% of the items in each scale, as the values were greater than .4.

The items that were deemed completely relevant have been incorporated into the Epistemological Attitude Questionnaire (EAQ), which is the focal point of another research endeavor (Sivoronova & Vorobjovs, 2024).

The rationale behind including unanimous agreement items was rooted in the EAQ's utilization of the four-concept-based scale, which necessitates items with greater specificity and alignment with a shared scale. In contrast, the semantic method assumes a scale that evaluates and prioritizes the core category based on individual items, without taking into account the complexity of items and its impact on the overall scale. The items that achieved appropriate I-CVI and S-CVI/Ave scores but did not receive full relevance in S-CVI/UA underwent revision by the experts in the second round. The purpose was to create a set of items that aligned with the semantic method and prepared them for the third phase.

In the procedural stage, the third phase involved compiling the items for the final version of the Epistemological Attitudes towards Sources of Knowledge Semantic Questionnaire (EASQ). We conducted a selection process at three qualitative levels. First, we included items that had appropriate indices of I-CVI and S-CVI/Ave, which were selected and revised by experts in the second round with minor revisions to sentence structure and lexicon. Second, we made substantive revisions to certain items based on the experts' recommendations. These revisions primarily focused on three "criticism" items, two "subject-centrism" items, two "rejection of subject-centrism" items, one "science-centrism" item, and one "rejection of science-centrism" item. The major revisions aimed to improve the semantics of these items in order to align them more precisely with the scale. These revised items were then included in the set. Third, in accordance with the experts' recommendations, we developed new items for certain scales in the epistemological strategy, epistemological approach, and activity principle of personality domains. This was done because the number of items in these scales was lower than in other scales. We specifically developed new items for scales such as "optimism" "skepticism", "agnosticism", "criticism", "post-criticism", "fundamentalism and normativism", "rejection of subject-centrism", "rejection of science centrism", and "reduction". However, differentiating these scales and their paired scales proved challenging due to the complex epistemological meanings associated with their categories, which are deeply rooted in contextual semantics and interpretations. Table 1 provides an overview of the final set of 92 items in the EASQ, with five to eight items allocated to each scale. The subsequent sub-section provides a comprehensive explanation of the method utilized in the fourth stage.

**Epistemological Attitudes Towards Sources of Knowledge Semantic Questionnaire**

The fourth stage of the method development process focused on semantics. This stage involved organizing the overall structure, developing semantic groupings, and creating corresponding scales. By adhering to the semantic methodology (Petrenko & Mitina, 2014; Fodor, 1987; Osgood, Suci, & Tannenbaum, 1957), we developed two sets of items and scales for evaluating their semantics. First, to investigate the meanings and establish semantic constructs of the sources, and second, to explore the categories themselves. Consequently, the initial set of items aims to assess the sources in accordance with the statements, while the subsequent set of items aims to evaluate the categories.

The first set consists of 92 statements, full statements selected in the previous stage. These statements, referred to as *set A statements*, are used to evaluate each of the seven selected sources of knowledge in the formal stage. Each statement describes different aspects of the source's content, functions, and characteristics, expressing the individual meaning of each statement. The meaning of each statement is defined by *the object of the statement* in terms of the *semantic categories*. They are characteristics, qualities, functions, thoughts, emotions, actions, behaviors, values, and other criteria which characterize the source and its knowledge. Each statement has unique semantic categories.

To measure the *semantics* of these statements, we accommodated a semantic differential scale (Osgood et al., 1975). The modified semantic differential scale is used for each object of the statement, employing a 7-point response rating scale (-3, -2, -1, 0, 1, 2, 3). The semantic gradation of the response is as follows: a rating of "3" indicates the highest rating according to the object of the proposed statement, while a rating of "-3" signifies the presence of the object of the statement in its highest degree of opposition or its absence. A rating of "0" represents a neutral position depending on the meanings of the poles of the response scale. These poles can be "neither agree nor disagree", "neither descriptive nor undescriptive of the source at the same time", "sometimes", "partially—both descriptive and undescriptive", "partially—both", or "not explicit—both". The midpoints (-2, -1, 1, 2) provide gradations between the adjacent options. In essence, each option on the scale expresses the extent to which each statement describes the sources, enabling us to measure the meanings of them.

The second set, referred to as *set B*, comprises the 92 objects mentioned in the statements. The sources mentioned in set A are no longer relevant in set B; the focus is solely on evaluating the object of each statement. These objects are clearly expressed within their *semantic categories*. These semantic categories need to be evaluated based on their relevance to different levels of knowledge: individual knowledge, objective and social knowledge, or knowledge about knowledge. The three levels of knowledge represent the implementation of intra-, inter-, and meta-knowledge within the EA.

The evaluation of relevance is conducted using a 7-point scale that ranges from 1 to 7. A score of 1 indicates that the semantic categories are most closely related to or reflect "*individual knowledge*" (my knowledge, subjective knowledge, other's individual knowledge). A score of 4 suggests that the semantic categories are most closely related to or reflect "*objective and social knowledge*" (scientific knowledge and/or knowledge in society), while a score of 7 implies that semantic categories are most closely related to or reflect "*knowledge about knowledge*" (transcendental, metaphysical and philosophical knowledge). Points 2, 3, 4, and 5 delineate the boundaries between the levels of knowledge. They indicate that the individual comprehends the semantic categories equally at both levels or leans closer to one of them. Figure 2 illustrates an example of the statement from sets A and B.

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**5A. The knowledge provided by the source is reliable.**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Scientific journal articles | | -3 | -2 | -1 | 0 | 1 | 2 | 3 | |
| Scientific monographs and books | -3 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 3 |
| University lecturers' knowledge | knowledge is not | -3 | -2 | -1 | 0 | 1 | 2 | 3 | knowledge |
| Textbooks and handbooks | reliable | -3 | -2 | -1 | 0 | 1 | 2 | 3 | is reliable |
| Popular science magazines and books | | -3 | -2 | -1 | 0 | 1 | 2 | 3 | |
| Academic social networks | | -3 | -2 | -1 | 0 | 1 | 2 | 3 | |
| Social media | | -3 | -2 | -1 | 0 | 1 | 2 | 3 | |

0
partially – both

---

**5B. Reliable knowledge.**

| 1<br>individual<br>knowledge | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 7<br>knowledge<br>about<br>knowledge |
|---|---|---|---|---|---|---|---|---|

4
objective and
social knowledge

*Figure 2*. The example of the statement of sets A and B in EASQ.

Essentially, in set A, the source is evaluated based on criteria or the objects of the statements. This approach allows us to explore the meanings of the sources and knowledge. However, in set B, individuals evaluate these criteria, expressed in semantic categories, to identify or locate them within the realm of knowledge where they are cognized and comprehended. This process allows us to explore the meanings of the knowledge itself.

The concepts of the EA were initially defined within a theoretical framework. Presently, we finalize the model of the EA in relation to the sources of knowledge. To describe the features attributed to four concepts, we present the semantic categories. These categories illuminate the features and reveal them as epistemological and psychosocial meanings in relation to the source, knowledge, and cognition in a general sense.

The epistemological strategy concept has three features. Each scale contains a set of five semantic categories.

*Optimism*: knowledge—the meaning of the studied subject; knowledge—current events in the world; creation of new knowledge; knowledge quality corresponding to the needs of academic society; reliable knowledge.

*Skepticism*: basic information about phenomena rather than extensive and in-depth knowledge; conditional predictions based on knowledge; only general insight into the problem; authors may be mistaken in certain statements, research results and their interpretation; certain topics are considered superficially and unconvincingly.

*Agnosticism*: the non-correspondence of the reflected reality to the truth; the inability of knowledge to solve scientific and social problems; indescribable and inexplicable aspects of reality; cognizance of the unknowable; the non-correspondence of the level of knowledge with its status in society.

The epistemological approach concept encompasses eight features. The scales include sets of five to six semantic categories.

*Criticism*: knowledge is stuck in theoretical positions; biased interpretations of research findings; incompleteness or erroneousness of the knowledge; skipped controversial aspects of the problem or other views on it; the prevalence of beliefs over verified knowledge; replicated knowledge.

*Post-criticism*: constructive criticism of representatives of different approaches; truthfulness and falsity of knowledge-equally relative (conditional) evaluations; critical evaluation of knowledge does not mean denying it; changes in the general ideas about various aspects of reality; critical discussions alter positions.

*Fundamentalism and normativism*: a system of ideas, moral norms and models of social behavior; fundamental knowledge; laws of logic and methodological principles; the idea of anthropocentrism; the truth is "hidden" and difficult to explore; philosophical and theoretical analysis of the researched problems.

*Rejection of fundamentalism and normativism*: not seeking for one truth; knowledge about daily life events; contemporary ideals, values and worldview reference points; new and innovative methodology; various cognitive approaches; absence of strict cognitive norms.

*Subject-centrism*: cognitive domain is emphasized in the acquisition and creation of knowledge; all (authors') knowledge contributes to the general knowledge system; uniqueness of knowledge—the authors' ability to integrate their own thinking and experience; comprehension of source content is an individual process of constructing meanings; the authors' evaluation is a reference point in the search for other sources.

*Rejection of subject-centrism*: the knowledge is the result of the interaction of the authors' cultural-historical research; collaboration of authors in research; admitting mistakes and shortcomings in own

knowledge; means of comprehension—the dialogue between the authors and between the author and the audience; one's attitude towards knowledge is the result of the process of socialization.

*Science-centrism*: rational scientific discussions; research is related to the cultural, social and scientific vision and mission; scientific thinking is the most reliable method to create knowledge; theoretical and empirical knowledge; scientific knowledge is distinguished from non-scientific forms of knowledge; high scientific credibility level.

*Rejection of science-centrism*: scientific tolerance and pluralism of positions; expert knowledge is the result of scientific communication; knowledge is the result of current scientific advancement; expression of scientific thinking in a constructive and creative orientation; scientific knowledge integrates some aspects of religious and metaphysical knowledge; a coherence of scientific and everyday rationality.

The context of cognition concept has two features. The scales include sets of seven and five semantic categories accordingly.

*Academic context*: knowledge for the organization and conducting scientific events, conferences and discussions; knowledge for a thorough analysis of study courses, research and projects; knowledge for the development of one's scientific thinking; knowledge to organize and manage work within an educational institution; sharing the knowledge with students and colleagues; knowledge for doing research; knowledge for supplementing and improving the content of study program courses or projects.

*Personal context*: applying knowledge in new social communication situations; sharing knowledge with friends and relatives; sustaining interest in knowledge; using knowledge for personal purposes; and knowledge for solutions for novel and uncommon tasks in everyday life.

The activity principle of personality in the cognition concept has three features. The scales contain sets of five to eight semantic categories.

*Selection*: knowledge for the development of a personal cognitive perspective; knowledge for aesthetic development; knowledge that stimulates thinking; knowledge for understanding the world around; knowledge that promotes productive and creative cognition; the meaning of cognizing knowledge—value on its own; knowledge acquisition—a mental effort; knowledge that encourages self-reflection.

*Homeostasis*: knowledge for the desired level of knowledge; knowledge forms new interests; knowledge forms one's worldview; the balance between other people's and one's knowledge and viewpoints; the importance of knowledge is assigned by academic society and educational institutions; knowledge acquisition—completing tasks at a high level; knowledge for intellectual development.

*Reduction*: only certain content of knowledge is important; applicability of knowledge in specific situations; knowledge that does not require emotional effort; knowledge is not important personally; knowledge acquisition is situational, unstructured, or impromptu.

In its entirety, the EA model enables the identification of epistemological strategies and approaches employed by individuals in perceiving, comprehending, applying, and resolving knowledge-related challenges. It also sheds light on the utilization of sources in academic and personal contexts, as well as the intentions and motivations behind the selection and usage of each source. Then, the EASQ allows us to build constructs of the sources based on the meanings they represent. These meanings can be identified within three dimensions: subjective, contextual, and epistemological, thereby underscoring the significance of the source by pinpointing specific categories at different levels of knowledge. Eventually, these categories transform into the focal point of evaluation, building the constructs of individuals' consciousness as they strive to uncover the essence of knowledge.

## Discussion

The article introduced the epistemological attitude (EA) theory and method, which aim to explore different levels of cognition, including intra-, inter-, and meta-knowledge. Drawing from interdisciplinary perspectives in social science and humanities, various concepts and methods were recognized. They focus on individuals' psychological and behavioral phenomena regarding cognition, learning and teaching. Our focus was to establish the theory that goes beyond an individual's subjective realm and instead examines the ontology where consciousness resides. The objective is to theorize and investigate knowledge, using individuals' consciousness as a means to reflect cognition, interaction, and the object of knowledge and then to reconstruct not the consciousness but the object. In accordance with this system approach, the object itself does not need to be investigated, analyzed, and scrutinized. Instead, it should be the focus of interaction, reflecting towards other systems, notably consciousness. Following that, we can proceed with the construction of the entity, albeit not precisely an entity, but rather the phenomenon it represents (Kant, 1781/1998). This phenomenon encompasses subjective, objective, and transcendental characteristics. According to Kant's transcendental philosophy, the object, as noumena or objects in themselves, cannot be fully known by our cognition.

In our research, we have found that semantic methodology is the most appropriate within the context of quantitative procedures (Kelly, 2002; Petrenko & Mitina, 2014; Osgood et al., 1975). The semantic method, specifically the epistemological attitudes towards sources of knowledge semantic questionnaire (EASQ), provides a framework for investigating the complexities of knowledge at multiple levels.

Through the development of this method, we emphasized the importance of knowledge and the various ways in which it is stored, transferred, and created. This is particularly relevant in today's informational paradigm, where the boundaries between knowledge levels are becoming blurred. The method we have developed challenges us to investigate the sources of knowledge by examining their epistemological and social-psychological significance. This approach allows us to reflect on the quality of knowledge, personal values, and the importance of knowledge for society, academia, education, and science.

Acknowledging the importance of knowledge sources within academic circles, our primary focus revolved around diverse sources capturing scientific, popular scientific, and social sources. Our method is specifically tailored for academics who have the knowledge and expertise to evaluate these sources using epistemological, philosophy of science, scientific, and educational terminology. They are considered experts in utilizing these sources.

This article outlined the core moments in the method development process. We proceeded through the formal and substantive stages, which involved developing a form and content of the method, involving deep phenomenological, deductive and inductive analysis of the content of theoretical and practical grounds of knowledge and their sources. We then proceeded with the procedural stage, implying the empirical study using the expert review approach to evaluate the developed content. Seven subject matter experts, including university lecturers and researchers specializing in philosophy, psychology, methodology, and education research, participated in the study, assessing the method's content validity (content validity index) and providing their evaluations, revisions, and recommendations, which were used to select and shape the future content of the method. In the final semantic stage, we presented the developed method, which is based on semantic categories for evaluating sources, representing their meaning, evaluating knowledge, and categorizing it within different levels of knowledge.

The limitations of the research lie in the novelty of the EA theory and the method itself. In addition, the method's complexity gives rise to inquiries regarding its applicability and implications. This highlights the future direction of our study. The development of the method has been a profound process that has now been completed, and we have initiated empirical research using the semantic method.

In addition to ensuring the reliability of the method and the validity of the theoretical model, we have two main objectives. The first is to analyze the meanings of sources and knowledge itself. The meanings of sources will be used to create constructs related to epistemological and socio-psychological values. The second objective involves delving into the meanings of knowledge, specifically within their respective categories, with an emphasis on understanding and comprehension.

The EA theory, which is a theory of cognition, is continuously being developed and offers numerous possibilities for its integration within philosophy, particularly in the field of epistemology. Additionally, due to its systemic approach, it can also be a subject of discussion in the philosophy of science and methodology. Social sciences, especially the sociology of knowledge, social epistemology, social psychology, and social cognition, may find interest in the EA theory. Moreover, the EA theory expands on the problem of personality activity, thereby connecting it with the philosophy of the subject's activity problem. This passion for developing the theory opens up avenues for various discussions.

Currently, we perceive the applications of the EA theory primarily in its methodology. The proposed semantic method has the potential to contribute to the analysis of the epistemological and socio-psychological significance of knowledge sources and their constructs of meaning in the academic realm. Through this, we can explore different sources, emphasize their importance, compare them, and discuss their characteristics. Since knowledge belongs to the transcendental realm of our being, we aim to emphasize its crucial role.

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