# Sociocultural Theory, Intertheory Dialogues and (In-)Commensurabilities in the Field of Second Language Acquisition: Introduction to the Special Issue

Saeed Karimi-Aghdam [1], and Rémi A. van Compernolle [2]

[1] *Corresponding author: Associate Professor of English Language and Didactics, Faculty of Education and Arts, Levanger Campus, Nord University, Norway,*
*ORCID: 0000-0002-1214-7830*
*E-mail: saeed.karimi.aghdam@nord.no*

[2] *Associate Professor of Applied Linguistics and Second Language Acquisition and French and Francophone Studies, Carnegie Mellon University, USA,*
*ORCID: 0000-0003-2381-6291*
*E-mail: vancomp@andrew.cmu.edu*

## Abstract

In this article, we first discuss the rationale behind opening up a dialogic space between sociocultural theory and other compatible theories. In the second section, a brief sketch of sociocultural theory in the field of second language acquisition (SLA) is provided. In the third section, exploring the constitutive relationality that ineluctably holds between a given SLA theory and its putative worldview, we enunciate implications and categorical influence of worldviews on day-to-day research inquiries and scientific practices of the SLA scientific community. Then, we set out to delineate scientific development in SLA invoking a Kuhnian perspective with a honed focus on the theory-laden nature of empirical evidence as well as the key notions of paradigm, disciplinary matrix, and incommensurability of competing theories. In the fourth section, we specifically settle our attention on the issue of incommensurability of, and inter-theory dialogues between, SLA theories with a view to the articles which are included in the special issue and discuss their theoretical and practical implications. We conclude with some remarks on the importance of adopting a weltanschauung-centered perspective on doing research activities, theory choice, and scientific development in SLA for advancing a principally unified and scientifically coherent understanding and explanation of second language developmental processes.

*Keywords:* sociocultural theory, second language acquisition, intertheory dialogue, Vygotsky, Kuhn, paradigm, disciplinary matrix, incommensurability, scientific change, worldview

## Introduction

The field of second language acquisition (hereafter SLA)[1] is yet to come of age as a mature scientific discipline after more than five decades of scientific research. The current fragmentation of SLA into warring schools of thought or at best divided theoretical camps hinders it from moving toward a unified and coherent scientific discipline (Ellis, 2021). To promote the unity of SLA as a scientific discipline, we maintain, two solutions could be envisioned. On the first view that we term the reductionist approach, one could argue that a single overarching conceptual framework could vertically subsume all other theories, approaches, models, and hypotheses in such a way that all of them could be ontologically reducible to nothing but to a specific foundational framework and conceptual matrix of a single theory and its well-conceded philosophical principles and axiomatic presuppositions. According to the second view which we term the pluralistic approach, one may subscribe to a pluralistic interpretation and horizontal inter-theoretic dialogues between ontologically commensurable SLA theories which are based on congruous worldviews or 'conceptual schemas' (Karimi-Aghdam, 2024). According to the pluralistic approach, scrutinizing the process and product of second language development is irreducibly plural and should draw upon an array of interconnected theoretical models and methodologies which originate from, and are compatible with, a particular set of philosophical presuppositions and metatheoretical axioms which in turn are or should be in harmony with a single worldview (see also Ellis, 2010).

In line with the pluralistic approach, this special issue is in an attempt to foster what we believe to be a crucial conversation between Vygotskian sociocultural theory (hereafter SCT) and other complementary theories that have been extended to SLA. Our rationale is twofold. First, as SCT researchers ourselves, we believe that opening up dialogues with other approaches is critical to enriching the theory, developing new research methods, and enhancing the scientific rigor of our empirical work. Second, and more broadly, we believe that inter-theory dialogues are sorely missing from SLA in general, where despite a few attempts at reaching across the aisle so to speak in the 1990s, most L2 researchers have been content to work in theoretical isolation (see Lantolf, this issue). There are important recent exceptions to this of course. Hulstijn et al. (2014) proposed to bridge the gap between social and cognitive approaches to L2 research, and the Douglas Fir Group (2016) articulated a rich transdisciplinary framework for SLA. To our knowledge, such work has had little practical impact on the way research is carried out in our field, notwithstanding its meaningful contribution to our understanding of L2 development. This is unfortunate from our perspective since the lack of inter-theory dialogue and collaboration is most likely leading us to an unnecessarily impoverished understanding of our object of study. It is our hope that this special issue inspires further dialogues, debates, and inter-theory collaborations in a pluralistic, yet unifying way.

The eight papers included in this special issue engage in thought-provoking conceptual, methodological, and empirical comparative research that in our view help to push Vygotskian SCT in innovative directions and more broadly have the

potential to impact L2 research in other traditions. In this article, we will first set forth to provide a brief sketch of the history and some tenets of SCT. Then, in order to lay a conceptual foundation for probing the scientific development of SLA and its theoretical landscape drawing upon a Kuhnian lens, we examine the role of worldviews in our scientific inquiries including SLA theories while discussing the categorical influence of metatheoretical postulates and philosophical assumptions on our scientific investigations and research practice. In the third section, we delve more deeply into the pivotal concepts of normal science, scientific revolution, paradigm, disciplinary matrix, and incommensurability in line with Thomas Kuhn's historical understanding of scientific change to gain a better appreciation of the current state of the theoretical development and historical trajectory of SLA as a maturing yet young scientific discipline. In the fourth section, we will take a closer look at the notion of incommensurability within the context of SLA theories and SCT in particular to garner insights into the overarching aim of this special issue which is to foster inter-theory dialogues between SCT and other ontologically and methodologically congruous theories. Finally, we conclude the article by offering some remarks on the image of scientific change in SLA drawing upon a Kuhnian perspective. Specifically, we discuss the limitations of formulating a unified approach for studying L2 development without heeding the determining influence of pertinent weltanschauung-anchored assumptions and philosophical categories on the integrated levels of any given SLA theory and hence on the nature, process, and object of scientific inquiry in SLA.

**Overview of Vygotskian SCT in L2 Development**

Lantolf and Poehner (2023) point out that the label "sociocultural"—though widely used and recognized since it was first introduced in L2 work in the 1980s (Frawley & Lantolf, 1985; Lantolf & Frawley, 1984)—"does not do justice to what the theory is about" (p. 5). This is because it focuses on the socially distributed nature of cognition to the detriment of individual psychological functioning and may be easily confused with other social theories of L2 development. Drawing on Toomela (2008), Lantolf and Poehner go on to argue—and we agree—that the use of "cultural-historical" is more appropriate as it "emphasizes the development of individuals as a consequence of their participation in particular cultural practices that their community has evolved over the course of history" (p. 5). This is an important point because it underscores the variability in human cognition and development in relation to the modes of thinking—especially, though not solely limited to, *language*—that have evolved over time across cultures. And yet, we—like Lantolf and Poehner—continue to use "sociocultural"/SCT due to the inertia associated with the term after four decades of research. We will, however, undertake to point out, as do our contributors, the cultural-historical nature of language and L2 development.

Indeed, a central tenet of Vygotsky's theory is that human consciousness is mediated by culturally-historically constructed artifacts, language being one of the most important. As Vygotsky argued, culturally-historically constructed artifacts serve as auxiliary stimuli that reshape direct, or immediate, stimulus-responses processes into indirect, or mediated, processes. This allows people " to control their

behavior *from the outside* [italics in original]" (Vygotsky, 1978, p. 40), which is the key to human agency. For instance, while we are all born with the neurological hardware that subserves memory functions, the internalization of language–the quintessential sociocultural semiotic artifact–allows us to engage in voluntary memory and the narrativization of past experiences in socially, culturally, and contextually appropriate ways. And this illustrates the interest we have in understanding the theory in cultural-historical terms: because languages vary from phonology, to lexicogrammar, to pragmatics, to discourse, and so on, so too do the modes of linguistically mediated thinking that have developed from one culture to the next. Consequently, learning an additional language is not simply a matter of plugging new words, grammar, pragmatics, and so forth into existing modes of thinking; learning a new language entails learning to think through a new multi-semiotic system that has evolved along a different cultural-historical timeline.

The earliest work in this domain was carried out by Frawley and Lantolf (1985; Lantolf & Frawley, 1984), who investigated the extent to which an L2 could function intra-psychologically (i.e., within a person) to regulate thinking processes as evidenced by private speech. Their research suggested that many L2 users continue to rely on their L1 to regulate their thinking, even if they can use the L2 proficiently for communication. However, some very advanced L2 users with long-term experience in the L2 culture may become capable of using the L2 for thinking, at least some of the time. This finding has been confirmed and expanded in numerous studies over the past 40 years (see Guerrero, 2018) and has even been extended to include the cognitive role of gesture (see Stam, 2018 for an overview). What is especially interesting in this research is the suggestion that emergent bi/multilinguals appear to develop hybrid psychological systems in which the L2 (and any other additional languages the person may know) begins to mediate the structure of thinking processes and other psychological functions alongside the L1.

As L2 SCT research began to proliferate in the 1990s and early 2000s, many scholars began to investigate the role of collaboration and assistance in L2 development, drawing on one of Vygotsky's best known concepts, the zone of proximal development (ZPD). The ZPD idea focuses on the fuzzy space between one's current developmental state and a next, or proximal, state that is in the process of emerging (Valsiner & van der Veer, 2014). With a view to the main axioms of Vygotsky's worldview, the ZPD could be conceived as "a temporal and transitional interface of inter-psychological and intra-psychological planes of human development" where incremental quantitative changes have potentiality to be transformed to emergent qualitative changes by virtue of mediation afforded by more cable people through semiotic and material artifacts including linguistic activities (Karimi-Aghdam, 2017, p. 82). In the ZPD, a person's proximal developmental state can be observed as they collaborate with more capable people, even if a given ability is not currently under independent control. Thus, it is in the context of collaboration and assistance that the person's future development is co-constructed and becomes visible (e.g., to a teacher, to a third-party analyst) while at the same time its growth can be supported (i.e., assistance can lead to development) (Aljaafreh & Lantolf, 1994; Donato, 1994; Ohta, 2001; van Compernolle, 2015).

Poehner's (2008) research further extended this work to the domain of L2 dynamic assessment (DA) in which assessment tasks are intentionally designed to integrate teaching and testing as a dialectically unified activity. As such, support (e.g., including collaboration and assistance from a teacher) is made available to learners during the assessment in order to arrive at a dual evaluation of the learner: 1) the learner's current developmental state as evidenced by solo performance and 2) the learner's ZPD as evidenced by what they are able to do with support, often referred to as mediation. In this sense, mediation refers to means of support (e.g., a teacher or mediator) that create an indirect, or mediated, relationship between the learner and the assessment. In other words, the learner does not engage directly with the assessment but indirectly through a mediator.

Along with Poehner's (2008) work on DA, concept-based language instruction (CBLI) has helped usher in a new wave of L2 SCT research that attempts to unify theory and practice through educational praxis (Lantolf & Poehner, 2014). Drawing on Gal'perin's (1989, 1992) theory of the formation of mental actions, CBLI emphasizes the explicit teaching of semiotic concepts that can mediate learners' control over the L2. Semiotic concepts have been drawn from cognitive linguistics (Negueruela, 2005), pragmatics (van Compernolle, 2014), literacy research (Urbanski, 2023), and even law (Hartig, 2017). The concepts are materialized in the form of a SCOBA—schema for the complete orienting basis for action—which serves as a visual/multimodal reference point to assist learners in remembering 1) why an action is important and 2) how to orient to its execution appropriately. SCOBAs are used in verbalization tasks (e.g., explaining a concept to oneself), problem-solving tasks, and in preparation for communication tasks. Importantly, a sign of development is the eventual decrease in reliance on the SCOBA for using the concept appropriately.

This overview of L2 SCT research is necessarily brief, but it helps to highlight some of the major strands of scholarship and theorization that have developed over the past four decades. With the proliferation of SCT work in SLA has come a fair amount of theoretical cross-fertilization, as scholars have attempted to engage with the broader field of SLA as well as to expand the purview of SCT through engagements with theories of language, identity, and agency, among other issues. However, and as we believe the contributions to this special issue make clear, there is a need to examine more critically the issue of (in)commensurability when SCT scholars adopt and adapt exogenous theories into their work. We expand on this argument in the following sections. In the next section, we specifically examine the internal relationality of panoramic perspectives of the ultimate reality (i.e., worldviews) and SLA theories and discuss its far-flung implications for every aspect of doing research from data collection to theory appraisal.

### The Dialectical Interplay of Worldview and Theory in SLA

Establishing a productive relationship between a wide variety of theories, models, and hypotheses as part of an effort to develop a unified approach to studying L2 development has been a challenge since the field of SLA emerged in the 1950s. Such a proleptic unified approach would be necessarily interdisciplinary and

inter-theoretical given SLA's diverse roots in psychology, linguistics, behavioral studies, language teaching, and sociology, among other disciplines. This rich diversity has of course prevented the field of SLA from moving toward developing a unified approach in large part because the philosophical assumptions that underpin these theories are rarely subjected to systematic and sustained investigations, and there does not appear to be a de rigueur framework for doing so. Furthermore, the history of SLA as a scientific discipline has not been examined by drawing upon large-scale units of analysis such as 'paradigms' in the Kuhnian sense (Kuhn, 1962/1970a) to gain a historical understanding of scientific change of the discipline. In addition, while the theoretical and disciplinary diversity of SLA has yielded innumerable insights into various elements and mechanisms of L2 development processes, there is no consensus as to a set of comparative yardsticks that would help us assess the degree to which various theories most accurately and comprehensively reflect the nature of L2 developmental processes. Nor do we in SLA have a great consensus of opinion on appraisal principles to help us choose and arbitrate between multitudinous rival SLA theories that compete for paradigmatic dominance. Similarly, we do not have an agreed-upon corpus of guiding principles for abandoning those SLA theories which fail to live up to our scientific expectations and embracing those 'new' SLA theories that are introduced to the discipline with a promise of scientific success. Furthermore, theories of SLA implicitly or explicitly are anchored on, and of necessity operate consistently with, a broad matrix of fundamental assumptions, or 'conceptual schemas' (Karimi-Aghdam, 2024), that determine problem formulation, methodological approaches, legitimate kinds of questions, 'incontrovertible' facts, and what 'counts' as evidence of L2 developmental processes.

It is worth clarifying six points concerning the relationship between an SLA theory and any given worldview that, we suggest, are at stake here. First, not being aware of an SLA theory's weltanschauung (i.e., worldview) and its putative philosophical presuppositions does not necessarily cast serious doubts on the categorical influence of worldviews on scientific activities that SLA researchers do in their day-to-day inquiries. Second, enunciation of philosophical assumptions and operating conceptual categories of a specific SLA theory at worldview level does not necessarily mean that SLA researchers consciously and consistently as well as individually and collectively invoke them to conduct their scientific inquiries about SLA matters. Third, within a single worldview, there might be several SLA theories with broad family resemblances which are compatible, and with varying degrees of conceptual and empirical consistency, comport with an all-encompassing philosophical view of the ultimate reality of L2 development. Fourth, a multilayered and nested worldview and an SLA theory which is compatible with it develop dialectically; that is, fundamental tenets of an SLA theory and even 'factual' claims generated by dint of it are mediated and inter-defined by the philosophical presuppositions and fundamental categories of a putative worldview and vice versa. Presuppositions and categories of a worldview are modified and refined to fit 'scientific facts' that are generated by a given SLA theory and the 'scientific facts' of an SLA theory are interpreted in light of presuppositions and categories of its putative worldview.

Fifth, 'scientific facts' of an SLA theory may acquire new meanings and yield different interpretations when they are looked at through a new array of undergirding presuppositions and philosophical categories which belong to another equally tenable yet alternative worldview. Sixth, if philosophical categories and presuppositions of two alternative yet distinct worldviews are not congenial in terms of their truth criteria and conception of the ultimate nature of L2 development, eclectic merging of SLA theories operating within those philosophical views of the world ineluctably will lead to numerous confusions at both theoretical and empirical levels. In other words, irrational mixing of SLA theories which are predicated on incompatible worldviews will bring about pernicious paradoxes about various research procedures including framing research questions and problems, collecting data, analyzing data, interpreting findings, making inferences, and drawing conclusions.

Further, conceptual schemas (i.e., worldviews) conceivably might be mutually exclusive in terms of mutual untranslatability of their underlying array of concepts, categories, and axioms. This practically means that those SLA theories which are traceable to, and are directly grounded in, qualitatively incongruous conceptual schemas are essentially incompatible in terms of their conceptualization of the ultimate reality and nature of L2 development. Accordingly, it is untenable to coalesce SLA theories which are ontologically and methodologically incommensurable and hence have an interconnected network of concepts and terms that are untranslatable and non-comparable as such. For example, the Marxian-Hegelian conceptual schema within which SCT functions is qualitatively and ontologically at variance with the Cartesian conceptual schema within which some SLA theories such as Krashen's Monitor Model (e.g., Krashen, 1982) operate; hence any endeavor in terms of conceptual integration of, or even collating of 'objective data' and 'observed facts' which are yielded by, SCT and the Monitor Model will be of limited explanatory value at best and scientifically indefensible at worst. We will return to this point in the fourth section.

It should be noted that conceptual schemas or weltanschauungen within which theories of SLA operate inherently are neither falsifiable nor verifiable per se by empirical methods and evidence; yet they can be evaluated, in principle, in terms of their usefulness (Karimi-Aghdam, 2024). In other words, the metatheoretical tenets and philosophical assumptions of an SLA theory –from which its lower-level basic concepts and principles are derived or at least are compatible with– are empirically irrefutable and infallible. This basically means that empirical investigations which are conducted drawing upon theoretical principles of a specific SLA theory neither confirms nor refutes superordinate assumptions and presuppositions of that theory at metatheoretical and worldview levels. Additionally, the prima facie empirical 'falsification' in the guise of denial of a scientific hypothesis or an array of hypotheses formulated according to the principles of a specific SLA theory does not carry a conclusively refutative weight on its higher-level conceptual categories and associated assumptions (see also Hulstijn, 2020; McLaughlin, 1987; Schumann, 1993).

The defining influence of conceptual schemas on observations and facts-theory dependence is documented by Hanson's (1958) seminal book 'Patterns of Discovery' where he argues about 'theory-laden' nature of 'seeing'. The credo of 'to see is: to see as', propagated by Hanson (1958), basically means that any observational evidence, by its very nature, is essentially subject to biases and dispositions which a researcher may have on account, and indeed because, of broader currents of a putative theoretical perspective that they draw upon in their research activities. A scientist primarily sets out to search for a 'conceptual pattern in terms of which his data will fit intelligibly along better-known data' (ibid., p.72). Hence, a scientific perspective is necessarily viewed through a conceptual pattern of a scientist. The theory-laden nature of observation proposed by Hanson (1958) resonates with Thomas Kuhn's (1962) insistence on non-neutrality of observational language to which we shall return shortly. Sanctioning theory-ladened nature of data that we collect in our empirical investigations of SLA-related issues and problems (see also Schumann, 1983), we maintain that worldview-level presuppositions too cast a web of significative force and meaning to our individual and collective scientific practices from research methodology to data collection and hypothesis testing. For example, SCT with its worldview foundation grounded on dialectical and historical materialism (Karimi-Aghdam, 2016; Lantolf, 2017), foregrounds investigating the cultural process of becoming of human consciousness and higher human mental functioning and, closer to home, developmental trajectory of an L2 system using Vygotsky's dialectical methodology to which he referred as the 'genetic method' (Lantolf & Karimi-Aghdam, 2020).

On this score, the underdetermination of scientific theory by observed facts known as the 'Duhem-Quine Thesis' poses serious challenges to the categorical falsification of a single and isolated scientific hypothesis by observational evidence. Singling out and empirically testing an insulated scientific hypothesis from the tangled skein of auxiliary assumptions is impossible in accordance with the 'Duhem-Quine Thesis'. Therefore, informed by Duhem-Quine's thesis about interdependency of theory and data which is compatible with our own point of view, we could conclude that every SLA theory which may yield, in principle, a matrix of indefinite number of hypotheses is underdetermined by the insufficiency and inadequacy of empirical evidence that we collect and analyze in our empirical investigations (for SLA-related discussion of the Duhem-Quine Thesis, see Beretta, 1991; Schumann, 1993; and for philosophical discussion of it, see Ariew, 1984; Balashov, 1994). With a view to garner fresh insights about the pattern of scientific change and actual disciplinary practices of SLA researchers, in the next section, we shall elucidate the theoretical terrain of SLA by drawing upon Thomas Kuhn's philosophy of science and his conception of some key terms such as paradigm, disciplinary matrix, normal science, revolutionary science, and incommensurability which are pivotal to his perspicuous view of science.

## Scientific Development in SLA: A Kuhnian Perspective

The importance of worldview and its impact on the things we- as knowing subjects- see and discover in our scientific activities was reinforced by the 'second

generation' of philosophers of science (Callebaut, 1993). These philosophers, spearheaded by Thomas Kuhn (1922-1996), who espoused a naturalized philosophy of science (Giere, 1985), bring into sharper focus the social character of science and scientific development. These philosophers of science rivet their attention on the influence of the 'context of discovery' with a focus on reliable description of relevant contextual factors which give rise to emergence of a scientific theory and accordingly foreground the role of 'history' in scientific change. The (logical) positivist-influenced philosophers of science, on the contrary, were interested in the 'context of justification' with a focus on prescription of the methodological rigor and brought to the fore the importance of accumulative nature of scientific change (i.e., gradual and linear accretion of science by stoking new add-on objective facts to an extant repertoire of scientific facts) (see also Bird, 2012; for the distinction between 'context of discovery' vis-a-vis 'context of justification', see Reichenbach, 1938).

Thoms Kuhn in his seminal and revolutionary book entitled 'The Structure of Scientific Revolutions' (hereafter SSR) (1962/1970a) ushered in a novel perspective about scientific change. According to him, the progress of science, and by the same token a scientific discipline in natural sciences, is neither accumulative nor uniform. Rather, science proceeds according to iterative cycles of 'normal science' and 'scientific revolution'. A revolutionary phase of scientific development does not merely exhibit differences of degree compared with a normal science phase. Rather, they differ qualitatively in that truth criteria against and through which a disciplinary scientific research is adjudicated and indeed a web of meaning and order imposed on the miscellany of empirical data undergoes fundamental change when science transforms from a 'normal' type to a 'revolutionary' type. Hence, a scientific revolution spurs a revision to extant scientific belief or practice (Kuhn, 1962/1970a). It should be observed that in SSR Kuhn proposes "a view of science which is part descriptive and part prescriptive" (Suppe, 1984, p. 89). Kuhn's account of science is descriptive in that he sets forth "to describe how science has developed" (ibid.) through a repeated pattern of normal science dominated by a prevailing scientific paradigm, partitioned sporadically by revolutionary science. Revolutionary science, Suppe goes on to assert, entails a new scientific paradigm that parts company with the preceding one by virtue of its ontological and epistemological pronouncements. On the other hand, according to Suppe (1984), Kuhn espouses a prescriptive account of science by recommending "this pattern [i.e., iterative pattern of normal science-revolutionary science-normal science] as how science ideally *ought* to proceed" (p. 89, emphasis in original). Kuhn thereby articulates factually what science is and evaluatively what science ought to be. Underwriting Suppe's (1984) admonition against accepting "uncritically Kuhn's views on science as determining the appropriate way of doing science" (p. 97), we still believe that casting a Kuhnian light on SLA offers us valuable lessons, among others, about how the theoretical landscape of our discipline changes and what differential impact an array of extra-scientific factors and meta-theoretical assumptions has on our scientific inquiries and research activities.

The general pattern of scientific development, according to Kuhn (1962/1970a), commences with pre-paradigmatic science. It is characterized by rival approaches and theories competing for scientific dominance coupled with contentious and raging discussions about proper onto-epistemological postulates and the right methods of inquiry. The pre-paradigmatic science is followed by 'normal science' after a prevailing paradigm is established to resolve problems. Then, the emergence of anomalies if they resist solutions within the confines of a prevalent paradigm prompts a sense of crisis. Some anomalies are resolved by being incorporated one way or another to the extant shared scientific paradigm of normal science; this kind of anomalies is called 'ordinary anomaly' (Kuhn 1970a, p.186). Another type of anomalies called 'crisis-provoking one' (ibid., p.186) is not resolvable within the boundaries of a single scientific paradigm and may harbinger a 'scientific revolution', that is, a period of extraordinary and radical changes triggered in response to persistent problems and recalcitrant anomalies which in turn makes extant paradigm loosen its grip. Scientific revolutions are prompted when a scientific community senses that "…an existing paradigm has ceased to function adequately in the exploration of an aspect of nature to which that paradigm itself had previously led the way" (Kuhn, 1962, p. 91). Thereby scientific revolutions are "non-cumulative developmental episodes in which an older paradigm is replaced in whole or in part by an incompatible new one" (Kuhn, 1970a, p. 92) and accordingly a novel paradigm emerges and the scientific community starts practicing a new and long era of 'normal science'. After a relatively long period of normal science which "is predicated on the assumption that the scientific community knows what the world is like" and "often suppresses fundamental novelties because they are necessarily subversive of its [i.e., normal science] basic commitments" (Kuhn, 1970a, p. 5), a new crisis is brought about by unresolved puzzles and empirical anomalies that a paradigm runs into and so on. The transformation of normal science -"a strenuous and devoted attempt to force nature into the preformed and relatively inflexible box that the paradigm supplies" (Kuhn, 1970a, p. 24)- to a short bout of revolutionary science is inaugurated when:

> Confronted with anomaly or with crisis, scientists take a different attitude toward existing paradigms, and the nature of their research changes accordingly. The proliferation of competing articulations, the willingness to try anything, the expression of explicit discontent, the recourse to philosophy and to debate over fundamentals, all these are symptoms of a transition from normal to extraordinary research (Kuhn, 1962, p. 90).

The notion of paradigm introduced by Kuhn merits close examination here. It is pivotal for both normal science and revolutionary science. According to Kuhn (1970b), a paradigm "underscore[s] the dependence of scientific research upon concrete examples that bridge what would otherwise be gaps in the specification of the content and application of scientific theories" (p. 16). Simply put, a paradigm is a complex of theories, frameworks, concepts, research methods and techniques, research practices, laboratory apparatus, social and contextual processes and structures and, not least, a pertinent worldview that are shared collectively by a specific scientific community. We need to acknowledge that the blanket term of

paradigm is used to signify 21 different meanings in Kuhn's book (i.e., SSR) (Masterman, 1970)[2]. According to Masterman (1970), all these meanings can be categorized in three main groups: 1) metaphysical paradigms or metaparadigms, 2) sociological paradigms, and 3) artifact or construct paradigms. Kuhn (1977) faced with critiques who argued that paradigm is an equivocal term with protean usages (e.g., Shapere, 1964) offered two distinct sets of definition for it: (1) a global sense of paradigm encompasses "the entire constellation of beliefs, values, techniques, and so on shared by the members of a given community" and (2) a local sense of paradigm which is a subset of a global one and includes "one sort of element in that constellation, the concrete puzzle-solutions which, employed as models or examples, can replace explicit rules as a basis for the solution of the remaining puzzles of normal science" (Kuhn, 1970a, p. 175). He calls the first sense of the term that encompasses 'all the shared commitments of a scientific group' 'sociological' and the second sense of the term that embraces 'shared exemplars' 'exemplary past achievements' (Kuhn, 1977, p. 294).

The global sense of the term paradigm corresponds to 'disciplinary matrix' (Kuhn, 1977, p. 297) which is 'the common possession of the practitioners of a professional discipline' and is 'composed of ordered elements of various sorts, each requiring further specification'. Disciplinary matrix is a functional whole and 'account[s] for the relatively unproblematic character of professional communication and for the relative unanimity of professional judgment' (ibid., p. 297) of the practitioners of a particular scientific community or discipline in professional matters. Four main components of the disciplinary matrix of a scientific community include (1) symbolic generalizations: 'those expressions, deployed without question or dissent by group members, which can readily be cast in a logical form' and 'are the formal or the readily formalizable components of the disciplinary matrix' (e.g., $f = ma$) (Kuhn, 1970a, pp. 182-183); (2) models, metaphysical paradigms or the metaphysical parts of paradigms: 'are what provides the group with preferred analogies or, when deeply held, with an ontology' and 'at one extreme they are heuristic' such as 'a gas behaves like a collection of microscopic billiard balls in random motion' and 'at the other [extreme], they are the objects of metaphysical commitment' such as 'all perceptible phenomena are due to the motion and interaction of qualitatively neural atoms in the void' (Kuhn, 1977, pp. 297-298). Models, from heuristic to ontological ones, 'supply the group [practitioners of a scientific community] with preferred or permissible analogies and metaphors…help to determine what will be accepted as an explanation and as a puzzle-solution…[and] assist in the determination of the roster of unsolved puzzles and in the evaluation of the importance of each' (Kuhn, 1970a, p. 184); (3) values: 'though [values] function at all times, their particular importance emerges when the members of a particular community must identify crisis or, later, choose between incompatible ways of practicing their disciplines' (Kuhn, 1970a, pp.184-185). Thus, one can conclude that in accordance with Kuhn's argument, scientific values operate at both micro-level when scientific values are applied to single choices within purview of theories and at macro-level when 'values [are] to be used in judging whole theories' (ibid., p.185). Those values which are about prediction are the most deeply held ones such as quantitative predictions have priority over qualitative ones,

predictions should be accurate, and consistent satisfaction of prediction should be assured. Some of the macro-level scientific values which are drawn upon in the holistic evaluation of theories especially when a sense of crisis sharpens and subsequently scientific revolutions start are: formulation of puzzles and solutions, simplicity, consistency, plausibility, compatibility with other extant theories, social usefulness, and, more importantly, accuracy. Despite the fact that scientific values extensively and profoundly are committed to, and shared, by members of a given scientific community in such a way as to be constitutive features of science, scientists impress their individual and subjective stamp on their application (Kuhn, 1970a); and finally (4) shared exemplars: are a set of 'the concrete problem-solutions that students encounter from the start of their scientific education, whether in laboratories, on examinations, or at the end of chapters in science texts' (Kuhn 1970a, p. 187). Kuhn continues his enunciation of shared exemplars by stating that additionally 'some of the technical problem-solutions found in the periodical literature that scientists encounter during their post-educational research career' show to scientists as members of a disciplinary matrix by example how their scientific research should be conducted (Kuhn 1970a, p. 187).

Apart from being the fourth component of a disciplinary matrix, 'shared exemplars' is the second major sense (i.e., local sense) of the term paradigm and a central pillar of doing science by a specialized scientific community. Kuhn (1970a) considers using the term 'paradigm' to denote 'shared examples' appropriate 'both philologically and autobiographically' and maintains that 'differences between sets of exemplars provide the community fine-structure of science' (pp.186-187). They are 'concrete puzzle-solutions which, employed as models or examples, can replace explicit rules as a basis for the solution of the remaining puzzles of normal science' (ibid., p. 175). A problem-solution paradigm is a scientific community's consensus model of solving the scientific puzzles without which the laws and theories will be devoid of any empirical content. Exemplary concrete instances of doing scientific research - the only component of the disciplinary matrix which can be articulated explicitly- empowers members of a scientific community to make a connection between a phenomenon and more broadly nature and symbolic generalizations. Maturing members of a scientific community implicitly acquire and socialize in the components of a putative disciplinary matrix of a specialized science through and because of studying and doing archetypal exemplars which embody 'a time-tested and group-licensed way of seeing…[and scientists] solve puzzles by modeling them on previous puzzle-solutions' (Kuhn, 1970a, p. 189). In the words of Kuhn (1970a),

> The resultant ability to see a variety of situations as like each other . . . is, I think, the main thing a student acquires by doing exemplary problems.... After he has completed a certain number, which may vary from one individual to the next, he views the situations that confront him as a scientist in the same gestalt as other members of his specialists' group. (p. 189).

Closely linked to the concept of paradigm is the notion of 'incommensurability' which is borrowed from mathematics where, for example, it applies to the relation between the side and diagonal of a square in that there is no common unit that can

be used to measure both. Kuhn has applied this concept to competing paradigms which do not have a common measure and accordingly, it is argued by some including Kuhn himself in his earlier writings (e.g., Kuhn, 1970b) that, no rational and direct comparison could be made between those rival paradigms[3]. He further argues that theory choice and change of successive scientific theories could not be pivoted on neutral and objective observational language, and that it is impossible to communicate between incommensurable theories and, accordingly, render them in an array of common linguistic expressions and terms (Kuhn, 1970a). Besides, Kuhn (1982) contends that the axiom of 'no common measure' when applied to the conceptual matrix of a scientific theory takes on a metaphorical significance and accordingly becomes 'no common language'. For example, discussing the revolutionary transition between successive competing theories, he argues that:

> The point-by-point comparison of two successive theories demands a language into which at least the empirical consequences of both can be translated without loss or change…. Ideally the primitive vocabulary of such a language would consist of pure sense-datum terms plus syntactic connectives. Philosophers have now abandoned hope of achieving any such ideal, but many of them continue to assume that theories can be compared by recourse to a basic vocabulary consisting entirely of words which are attached to nature in ways that are unproblematic and, to the extent necessary, independent of theory. … In the transition from one theory to the next words change their meanings or conditions of applicability in subtle ways…Successive theories are thus, we say, incommensurable (Kuhn, 1970c, pp. 266-267).

According to this view, when two rival theories are incommensurable, it means that one cannot translate factual and theoretical assertions of one theory into the language of another theory. Incommensurable successive theories stand at cross purpose simply because two competing theories are operating within fundamentally incompatible and different sets of assumptions and axioms. And more importantly, the meaning of every term in a given scientific theory is contingent on being part of a coherent constellation of theory-specific assumptions and paradigmatic values. In accord with incommensurability of competing theories Kuhn does not grant that scientific progress in the sense of converging on a truth is made when conceptual change happens (McMullin, 1976). Rather, rejection of the old theory and embracing of another candidate theory necessarily means that logically incompatible worldviews and ways of doing science are at stake and no rational decision or 'neutral algorithm for theory-choice' can be made nor does exist a 'systematic decision procedure' (Kuhn, 1970a, p. 200) about theory choice and their assessment. On this score, considering it opposed to scientific realism[4], Hacking (1983, p. 66) defines incommensurability as follows:

> It has been said that successive and competing theories within the same domain 'speak different languages'. They cannot strictly be compared to each other nor translated into each other. The languages of different theories are the linguistic counterparts of the different worlds we may

inhabit. We can pass from one world or one language to another by a gestalt-switch, but not by any process of understanding.

It seems that Kuhn's thesis regarding incomparability of incommensurable theories underwent a fundamental change in later years in consideration of, and in response to, some charges leveled against his standpoint including a relativistic conception of theory choice and scientific progress. He, for example, goes so far as to assert that incommensurability of successive scientific theories does not necessarily mean that rival theories cannot be compared:

> The claim that two theories are incommensurable is then the claim that there is no language, neutral or otherwise, into which both theories, conceived as sets of sentences, can be translated without residue or loss. No more in its metaphorical than its literal form does incommensurability imply incomparability, and for much the same reason. Most of the terms common to the two theories function the same way in both; their meanings, whatever those may be, are preserved; their translation is simply homophonic. Only for a small subgroup of (usually interdefined) terms and for sentences containing them do problems of translatability arise… The terms that preserve their meanings across a theory change provide a sufficient basis for the discussion of differences and for comparisons relevant to theory choice. They even provide… a basis from which the meanings of incommensurable terms can be explored. (Kuhn, 1982, pp. 670-671).

It is worth mentioning that three varieties of incommensurability are differentiated in line with Kuhn's exposition of the term: (1) semantical incommensurability which means that non-translatability of the distinct languages of scientific theories from different periods of normal science by its very nature generate impediments to the perspicuous comparison of those competing theories; (2) observational incommensurability which means observational data due to its theory-ladenness cannot provide a common measure for comparing competing theories; (3) methodological incommensurability which means that theories which belong to different paradigmatic camps could not be compared using a common measure and evaluative scheme since comparison and evaluation methods change over time when a new paradigm replaces an old one (Delvin, 2021; Sankey, 1993). It seems that Kuhn's evolving view about the notion of incommensurability settles its attention on the semantical type. For example, in a chapter entitled 'dubbing and redubbing: the vulnerability of rigid designation', he elucidates his take about incommensurability by stating that:

> Applied to a pair of theories in the same historical line, the term [incommensurability] meant that there was no common language into which both could be fully translated.[4] Some statements constitutive of the older theory could not be stated in any language adequate to express its successor and vice versa. Incommensurability thus equals untranslatability, but what incommensurability bars is not quite the activity of professional translators. Rather, it is a quasi-mechanical activity governed in full by a

manual that specifies, as a function of context, which string in one language may, *salva veritate*, be substituted for a given string in the other (Kuhn, 1990, p. 299).

In the footnote number 4, Kuhn states, but without developing the point further, that 'My original discussion described nonlinguistic as well as linguistic forms of incommensurability. That I now take to have been an overextension resulting from my failure to recognize how large a part of the apparently nonlinguistic component was acquired with language during the learning process' (ibid., p. 315). This discussion segues into the next section where we discuss the notion of incommensurability within the SLA context and SCT in particular.

### (In)commensurability and SLA Theories in Dialogue

Over 25 years ago, Dunn and Lantolf (1998) attempted to redress the incommensurability of Vygotsky's ZPD concept and Krashen's (1982) notion of $i + 1$. This was in the context of the so-called "social turn" (Block, 2003) in L2 research, which generated a number of debates in a field that was at the time dominated by cognitivist perspectives. The rise in SCT-driven research–especially starting in the mid-1990s–resulted in some L2 researchers trying to find parallels between a number of Vygotsky's concepts and more established psycholinguistically oriented SLA theories, including equating the ZPD with the more familiar $i + 1$ construct based on superficial similarities (i.e., what comes next in acquisition order). Drawing on Kuhn's (1962, 1982; Hacking, 1983) work in the philosophy of science, Dunn and Lantolf argued that there was a problem of meaning-incommensurability: "the impossibility of translating from the language of one scientific theory or conceptual framework into the language of another, rival theory or framework" (Pearce, 1987, p. 3). At issue were the incompatible ontological underpinnings of Vygotsky's and Krashen's theories within which the ZPD and $i + 1$ were proposed respectively (see also Kinginger, 2001). Namely, while Vygotsky's theory is rooted in a cultural-historical framework for understanding the development of modes of thinking (see above), Krashen espoused an innatist framework in which a universal and biologically endowed built-in syllabus determined the order of the acquisition of linguistic forms that were separated from conscious thinking processes.[5] Thus, while at first blush the issue of "what comes next"[6] appears similar in both the ZPD and $i + 1$ ideas, they are not translatable because the concepts ultimately derive from incompatible theories of the human mind and the relationship between thought and language which, in turn are informed by ontologically incommensurable worldviews.

It is not our intention to rehash the ZPD/$i + 1$ debate from over two decades ago; to our minds, it is settled, although we can attest to some lingering confusion in informal conversations with colleagues and students from time to time. We simply bring up this example to illustrate the way in which we conceived of the aim of this special issue and how we operationalized commensurability; namely, as an issue of translatability across theories based on an understanding of the ontological and

epistemological assumptions of two or more theories. In our call for papers, we outlined six axes along which contributors were challenged to consider the issue of (in)commensurability:

1.  How does the theory define language?

2.  How does the theory define language learning?

3.  What is its unique methodology and what counts as evidence of language learning?

4.  How does it relate to language teaching?

5.  How does the theory stand vis-à-vis sociocultural theory in terms of its ontological and epistemological axioms?

6.  How the associated axioms of each theoretical framework could be integrated or complemented with those of sociocultural theory to form a coherent and pluralistic (meta)theory of SLA (if at all)?

We address each of these axes and their relationship to the theme of the special issue in turn. One of the most important issues for SCT in dialogue with other theories is the way in which language is theorized and empirically operationalized. Indeed, as Thorne and Lantolf (2005) and Lantolf and Thorne (2006) propose in their linguistics of communicative activity (LCA) framework, SCT has no home-grown theory of language and we must, therefore, borrow from and integrate theories of language and communication that are commensurable with Vygotsky's understanding of the relationship between thinking and speaking (or language *use* more generally). Vygotsky's (1986) notion of semiotic mediation (Wertsch, 1985) is central to this. Briefly put, language–or more accurately, the *use* of language in the form of a word or utterance–is a matter of meaning making, as speakers draw on a rich repertoire of culturally-historically developed communicative resources to make meaning and accomplish intrapersonal and interpersonal actions. In so doing, speakers call upon a set of habituated word/utterance-*meaning* connections –what Vygotsky referred to as *znachenie* in Russian–that are deemed appropriate for creating a contextually sensitive *sense*–or *smysl* in Russian–in concrete communicative activity. This view of language–and the LCA framework more generally–therefore rejects linguistic theories that focus on the structure of language divorced from its meaningful use in context since the assumption that language can be studied in isolation from the people that use it and the meanings they make is incommensurable with Vygotsky's theory. Thus, as Thorne and Lantolf (2005) and Lantolf and Thorne (2006) explain, the LCA draws primarily on cognitive linguistics (CL), usage-based linguistics (UBL), and discourse analysis because these approaches privilege meaning-making and social action as these activities are mediated by communicative activity.

The articles in this special issue engage with the LCA in a number of ways. In particular, we highlight the articles by White and Masuda and Kissling who engage with cognitive linguistics in the domain of L2 pedagogy and Ballesteros Soria and van Compernolle who report on work that integrates the principles of

conversation analysis (CA) with SCT for developing L2 interactional repertoires. White and Masuda's work synthesizes recent SCT-CL studies, finding that while SCT and CL are commensurable in terms of their orientations to language and cognition, there are some tensions when it comes to L2 pedagogy and research methods. For her part, Kissling applies CL in the context of CBLI and demonstrates that the CL concept of viewpoint (i.e., constructing bounded vs. unbounded meanings) helps to promote learners' development of control over the Spanish aspectual system. Ballesteros Soria and van Compernolle's extension of CA concepts to L2 pedagogy focuses on the ways in which language resources are deployed in order to carry out social action (e.g., turn taking, topic management). Thus, while CL and CA differ in their focus (i.e., cognition and semantics vs. action sequencing), both approaches fit with the LCA framework inasmuch as they eschew formal structural grammars in favor of a view of language that prioritizes how language mediates intra- and inter-personal meaning-making.

Related to the theorization and operationalization of language is defining what counts as language learning. While the lion's share of L2 research in general has primarily focused on L2 form accuracy, SCT expands the evidential basis for documenting L2 development since it is a theory of the development of human consciousness. As noted earlier, our interest in L2 development is grounded in the idea that it involves the development of new *modes of thinking*, not just the acquisition of a new linguistic system that can communicate one's current mode of thinking. Consequently, L2 SCT researchers are interested in learners' (meta)linguistic awareness, (meta)cognition, and ability to self-regulate. This is why we see analyses of concept formation (Kissling; White & Masuda) and pre-task planning data (Ballesteros Soria & van Compernolle) that provide evidence of learners' thinking processes in relation to L2 communication, as well as in curriculum development proposals that involve CBLI and dynamic assessment (Grazzi; Rosborough & Wimmer).

A common thread running throughout the articles in the special issue is the problem of methodological uniqueness and, by extension, the (in)commensurability of ontological and epistemological axioms. In his reflection article, Lantolf (this issue) cites McManus's (2024) synthesis of multiple SLA theories and writes: "different approaches establish different facts using different research methods and the different facts somehow need to be blended." Here, we would like to highlight two of the special issue articles in particular. Amory and Becker take on a comparative analysis of SCT and complex dynamic systems theory (CDST) with specific focus on the issue of motivation. As they point out, while the two theories appear to have some affinities, ultimately they are incommensurable because they establish different facts regarding motive (SCT) and motivation (CDST) using different units of analysis (i.e., an activity system vs. a complex system) rooted in incompatible understandings of their objects of study–motivation in itself (CDST) versus motive as unit of human consciousness (SCT). For their part, Siekman and Webster propose a diffractive methodology for reading theories in the context of Indigenous language teaching for maintenance and revitalization. The model centers the reading of one theory through another as opposed to pitting one against the other, which in our view has the potential to mediate the kinds of inter-theory

dialogues and establish meaning commensurability across theories. In the next section, we discuss some of the most important implications of scrutinizing the hidden onto-epistemological underpinnings and philosophical categories of SLA theories.

## Concluding Remarks

It may not go against the grain of SLA to contend that (logical) positivism and its philosophical and methodological progenies such as (neo-)positivism have held sway throughout much of the short history of SLA. Yet delving into (logical) positivism and providing a canvassed account of it with a view to SLA is not our immediate concern in this article (for a locus classicus in logical positivism, see Ayer, 1936; for SLA-related discussions see Jordan, 2004). Nonetheless, we maintain that adopting a logical positivist perspective on SLA which espouses a cumulative and progressive view of scientific change with its categorical emphasis on objectivism and empirical generalizations - discovered and generated inductively from pristine and value-free observations- does not fully capture the nature of day-to-day research activities that we as the scientific community of SLA researchers do. Nor does it properly characterize the nature of the holistic picture of SLA as a scientific discipline and how its theoretical pattern has changed historically. In addition, logical positivism's uncompromising reliance on sense data/observation and logical reasoning with the overriding aim of verification without due attention to the influence of hidden presuppositions and philosophical categories of SLA theories on various aspects of research inquiries seems untenable to us.

With regard to viewing SLA and its scientific change over time as well as its prevalent research practices through the logical positivism lens, we propose, at least three issues are at stake. First, in line with the logical positivism doctrine, the objectivity of empirical data that we collect in SLA inquiries basically means that observational language describes pure immediate experiences and accordingly is independent of and unaffected by any background ideas and meta-theoretical assumptions which transcend the realm of empirical world. Second, endorsing objectivity of 'sense data' means that SLA theories are genuinely testable and indeed can be verified (or falsified) by assumption-free observations and neutral empirical data. Third, objectivity of the scientific discipline of SLA, if one subscribes to the logical positivism doctrine, practically denotes that our collective decision to reject an SLA theory and accept another rival SLA theory is essentially governed by rational and objective criteria (for relevant discussions about logical positivism see Bergman, 1967; McMullin, 1982)[7].

Against the background of these points lurking in the SLA literature, we in this article engage in a process of self-inquiry concerning the philosophical underpinnings and axiological assumptions of SLA theories. In order to shed light on the theoretical terrain of SLA, we contend, a global unit of analysis such as the key term of paradigm in the Kuhnian sense is needed. Hence, we look at the scientific development of SLA which is hampered by disagreements over its associated set of orienting assumptions and its conceptually precarious status quo by

adopting a Kuhnian perspective. We argue that each SLA theory is consistent with and indeed is grounded on an interconnected web of conceptual spectacles and philosophical assumptions of a given worldview. This means, among others, that our empirical scrutinies and research activities are fashioned by a broad yet single set of background assumptions and philosophical concepts whose operation is seldomly noticed. And in line with the second generation philosophers of science, we maintain that data which we collect in our SLA research is by its very nature theory-laden, and neutral (i.e., purely objective and interpretation-free) observational language is a pseudoscientific creed. This observation might partly account for indiscriminate accumulation of empirical data in SLA which have yielded theory-dependent 'facts' about L2 development rather than uniformly observable facts which are ascertained under a specifiable and certain set of contextual conditions (see also Han, 2023).

Apropos to the discussion above, worldviews due to their unique conceptualization of reality, criteria for truth, and not least their definition of the nature of scientific knowledge may not be necessarily reconcilable with one another. This point has some resemblances with one of Kuhn's main theses in his seminal book SSR where he argues for incommensurability of rival scientific theories which are consistent with and function within a specific paradigm during normal science and revolutionary science periods. Therefore, we argue that for establishing inter-theory dialogues between SCT and other theories and for generating a more adequate, systematic and consistent understanding of L2 development, we must be cognizant of the fact that those theories need to be compatible with one another at the worldview level. Accordingly, the respective background philosophical concepts and assumptions of those theories need to comport with one another. Otherwise, the coherence of conceptual schemas will be ruptured and lead inexorably to a tangled skein of puzzlement at various stages and strategies of our empirical research. Conceptual confusions about the exact meaning of core concepts and key terms which are invoked to understand empirical observations and evidence about L2 development is also another detriment of failing to appreciate the issue of (in)commensurability. Moreover, incommensurability of competing SLA theories whose underlying philosophical assumptions are at variance with one another pushes to the fore the issue of losing scientific 'facts' and rupturing their accumulation over time and, equally important, divulges the impossibility of integrating the conceptual cores of rival SLA theories and collating and synthesizing their respective theory-generated findings.

Admittedly, an SLA theory in essence is a matrix of interconnected concepts that endeavors to understand and explain processes and mechanisms of changes in an L2 developmental system. Additionally, an SLA theory ultimately purports to generate a systematic and scientific body of knowledge substantiated by 'interpretation-free' empirical data whereas it is influenced simultaneously by taken-for-granted philosophical categories and orienting assumptions which are part and parcel of any given weltanschauung (i.e., worldview). A conceptual schema or worldview has a wide and unlimited scope and indeed enjoys a high level of abstraction; yet, its determining and pervasive influence on SLA researchers' thinking and their scientific investigation is ineluctable and discernible. The

integrated set of presuppositions and philosophical assumptions of any given worldview and by the same token any SLA theory which is consistent with it tends to exert decisive influence on and, indeed, would warrant a particular epistemology, a particular methodology, a particular way of data collection and analysis, a particular understanding of L2 developmental process, a particular definition of linguistic change, a particular scientific practice, and finally a particular understanding of SLA as a scientific discipline.

Hence, there is or better should be correspondence and compatibility, in principle, between the orienting assumptions of a worldview and all procedures of conducting a scientific inquiry using a given SLA theory which is framed according to that specific worldview. Consequently, when we shift from one worldview to another one or presumably from one SLA theory to a rival one, for example, the connotative meaning of empirical data and nature of the methodological perspectives and more importantly the essential significance of basic conceptual terms and essential notions become different and need to be revised if they are in conflict with the new worldview and its associated assumptions. This may result in losing some of the empirical findings or solved empirical problems associated with a given SLA theory with its particular guiding presuppositions simply because empirical knowledge and evidence gain their meaning and scientific value within the context of hierarchically organized levels of a specific SLA theory as a whole topped with a weltanschauung capstone. And any change in the meaning and scientific significance of terminological axioms and conceptual system of an SLA theory prompted by a change in the associated weltanschauung necessarily entails a fundamental shift in the meaning and interpretation of its putative observations and facts too.

Another point that we discuss about SLA theories is that strictly speaking an SLA theory is neither falsifiable nor verifiable simply because, as Kuhn (1962/1970a) reminds us, worldviews within which theories operate are not prone to empirical investigation and adjudication as such.[8] Therefore, when empirical data in our SLA-related inquiries are in conflict with a given theory, those discrepant data and anomalies may be put aside and the core axioms of that theory remain intact. In other words, non-correspondence of data and a specific SLA theory does not necessarily provide a compelling scientific argument for falsifying that theory nor is it replaced easily with an alternative theory which purportedly explains those anomalies more adequately or solves unsolved empirical problems of L2 development. The core constellation of axioms and philosophical categories of an SLA theory, following Kuhn's argument, are immune from empirical falsification. Hence, they remain unchanged until the entire set of orienting assumptions is dislodged en bloc because of a scientific revolution (which is yet to happen in SLA as such) or due to abandoning of an SLA theory by the SLA scientific community for concerns other than empirical refutation of its central presuppositions or even persistent empirical anomalies which are not resolved by the extant theoretical framework. Thereupon, we venture to conclude that the choice between competing SLA theories historically has not been, and still is not, necessarily based on the empirical refutation of the 'old' one by virtue of objective criteria such as internal

consistency, empirical accuracy, degree of corroboration, potentiality to solve unsolved problems, making accurate predictions, explanatory power, and so on (Karimi-Aghdam, 2024). Hence, theory choice in SLA does not seem to be rational as such[9].

Sanctioning a pluralistic approach to the field of SLA, we endeavor in this special issue to show a new path for developing a unifying approach to L2 development which aims to objectively describe, validly explain, accurately predict or retrodict, and pedagogically optimize the processual trajectory of learning an additional language over time by an agentive adult learner. Specifically, the goal of the special issue is to encourage SCT researchers to engage in broader discussions of inter-theory (in)commensurability in the context of SLA research with the overriding aim of systematizing a body of empirical and theoretical knowledge which are garnered by wedding the conceptual and theoretical skeleton of SCT with ontologically compatible approaches and theories. The seven articles included in the issue, as well as Lantolf's reflection piece, offer a number of avenues for pursuing theoretical and empirical research and engaging in L2 praxis. And establishing structuring guidelines for developing an overarching meta-theoretical frame of reference for SLA that has the potential to move our field beyond its pre-paradigm or immature status (Lantolf, this issue) and gradually turn it into a mature stage is another contribution that this special issue purports to make. Furthermore, it is our hope that the discussions and analyses presented in the issue will inspire future research to engage serious debates about the ontological, epistemological, and praxiological underpinnings of our work. Equally important, we hope that this special issue elucidates, to some extent at least, epistemic factors which are at play regarding inter-theory dialogue, development, appraisal, and rejection/acceptance of SLA theories not only for those working within the SCT scientific community but also for others in the broader field of SLA.

**Acknowledgments**

subscribe to everything that we have discussed here and all errors and oversights remain with us. As guest editors, we trust that *JALDA* readers will find this special issue to be useful for SCT-informed second language research and praxis but also for extending the debate on inter-theory dialogue and weltanschauung-centered perspective to other SLA theories, and by and large for examining direct bearing of meta-theoretical points of view on theory construction, theory choice, theory appraisal, as well as empirical investigations in the field of SLA.

## References

Aljaafreh, A., & Lantolf, J. P. (1994). Negative feedback as regulation and second language learning in the zone of proximal development. *The Modern Language Journal*, *78*(4), 465-483. https://doi.org/10.1111/j.1540-4781.1994.tb02064.x

Amory, M., & Lima Becker, M. (2023). L2 motivation as seen through the lenses of sociocultural theory and complexity / dynamic systems theory: Are they commensurable?. *Journal of Applied Linguistics and Applied Literature: Dynamics and Advances*, *11*(2), 31-61. https://doi.org/10.22049/jalda.2024.28021.1470

Ariew, R. (1984). The Duhem thesis. *British Journal for the Philosophy of Science*, *35*(4), 313-25. https://doi.org/10.1093/bjps/35.4.313

Ayer, A. J. (1936). *Language, Truth, and Logic*, (2nd ed). London: Victor Gollancz.

Balashov, Y. (1994). Duhem, Quine, and the multiplicity of scientific tests. *Philosophy of Science*, *61*(4), 608-28. https://doi.org/10.1086/289825

Ballesteros Soria, N., & van Compernolle, R. (2023). Collectivizing an orientation to turn-allocation as a learnable through pre-task planning. *Journal of Applied Linguistics and Applied Literature: Dynamics and Advances*, *11*(2), 133-160. https://doi.org/10.22049/jalda.2024.28178.1502

Beretta, A. (1991). Theory construction in SLA: complementarity and opposition. *Studies in Second Language Acquisition*, *13*(4), 493-511. https://doi.org/10.1017/S0272263100010305

Bergman, G. (1967). *The Metaphysics of Logical Positivism* (2nd ed.). The University of Wisconsin Press.

Bird, A. (2012). "The structure of scientific revolutions" and its significance: An essay review of the fiftieth anniversary edition. *The British Journal for the Philosophy of Scienc*e, *63*(4), 859-883. https://doi.org/10.1093/bjps/axs031

Block, D. (1996). Not so fast: Some thoughts on theory culling, relativism, accepted findings and the heart and soul of SLA. *Applied Linguistics*, *17*(1), 63-83. https://doi.org/10.1093/applin/17.1.63

Block, D. (2003). *The Social Turn in Second Language Acquisition*. Edinburgh University Press.

Callebaut W. (1993). *Taking the Naturalistic Turn, or, How Real Philosophy of Science is Done*. Chicago University Press.

Devlin, W. J. (2021). Kuhn and the varieties of incommensurability. In K. B. Wray (Ed.), *Interpreting Kuhn: Critical Essays* (pp. 105-124). Cambridge University Press. https://doi.org/10.1017/9781108653206.007

Donato, R. (1994). Collective scaffolding in second language learning. In J. P. Lantolf, & G. Appel (Eds.), *Vygotskian Approaches to Second Language Research* (pp. 33-56). Ablex.

Dunn, W., & Lantolf, J. P. (1998). Vygotsky's zone of proximal development and Krashen's i + 1: Incommensurable constructs; incommensurable theories. *Language Learning*, *48*(3), 411-442. https://doi.org/10.1111/0023-8333.00048

Ellis, R. (2010). Theoretical pluralism in SLA: Is there a way forward?. In P. Seedhouse, S. Walsh, & C. Jenks (Eds.), *Conceptualising Learning in Applied Linguistics* (pp. 23-51). Palgrave Macmillan.

Ellis, R. (2021). A short history of SLA: Where have we come from and where are we going?. *Language Teaching*, *54*(2), 190-205. https://doi.org/10.1017/S0261444820000038

Frawley, W., & Lantolf, J. P. (1985). Second language discourse: A Vygotskyan perspective. *Applied Linguistics*, *6*(1), 19-44. https://doi.org/10.1093/applin/6.1.19

Feyerabend, P. (1962). Explanation, reduction and empiricism. In: *Minnesota Studies in Philosophy of Science* (pp. 28-97), Vol. 3, ed. H. Feigl & G. Maxwell. University of Minnesota Press.

Gal'perin, P. Y. (1989). Mental actions as a basis for the formation of thoughts and images. *Soviet Psychology, 27*(3), 45–65. https://doi.org/10.2753/RPO1061-0405270345

Gal'perin, P. Y. (1992). Stage-by-stage formation as a method of psychological investigation. *Journal of Russian and Eastern European Psychology, 30*(4), 60-80. https://doi.org/10.2753/RPO1061-0405300460

Giere, R. N. (1985). Philosophy of science naturalized. *Philosophy of Science*, *52*(3), 331–356. https://doi.org/10.1086/289255

Grazzi, E. (2023). ELF and sociocultural theory: An integrated approach. *Journal of Applied Linguistics and Applied Literature: Dynamics and Advances*, *11*(2), 161-181. https://doi.org/10.22049/jalda.2024.28866.1581

Gregg, K. R. (2003). SLA theory: Construction and assessment. In C. J. Doughty & M. H. Long (Eds.), *The Handbook of Second Language Acquisition* (pp. 831-865). Blackwell.

Gregg, K. R., Long, M. H., Jordan, G. & Beretta, A. (1997). Rationality and its discontents in SLA. *Applied Linguistics, 18* (4), 538–558. https://doi.org/10.1093/applin/18.4.538

Guerrero, M. C. M. de. (2018). Private and inner speech in L2 learning: The impact of Vygotskian sociocultural theory. In J. P. Lantolf & M. E. Poehner (Eds.) with M. Swain, *Routledge Handbook of Sociocultural Theory and Second Language Development* (pp. 152-164). Routledge.

Hacking, I. (1983). *Representing and Intervening: Introductory Topics in the Philosophy of Natural Science.* Cambridge, UK: Cambridge University Press.

Han, Z-H. (2023). Issues of narrowness and staticity in ISLA. *Instructed Second Language Acquisition*, *7*(1), 3-26. https://doi.org/10.1558/isla.19454

Hanson, N. R. (1958). *Patterns of Discovery: An Inquiry into the Conceptual Foundations of Science*. Cambridge University Press.

Hartig, A. J. (2017). *Connecting Language and Disciplinary Knowledge in English for Specific Purposes: Case Studies in Law*. Multilingual Matters.

Hoyningen-Huene, P. (2004). Three biographies: Kuhn, Feyerabend and incommensurability. In R. Harris (ed.) *Rhetoric and Incommensurability* (pp.150-175)*,* Parlor Press.

Hulstijn, J. H. (2014). Epistemological remarks on a social-cognitive gap in the study of second language learning and teaching (pp. 375-380). In J. H. Hulstijn, R. F. Young, L. Ortega (Eds.), Bridging the gap: Cognitive and social approaches to research in second language learning and teaching. *Studies in Second Language Acquisition*, *36* (3), 361- 421. https://doi.org/10.1017/S0272263114000035

Hulstijn, J. (2020). Proximate and ultimate explanations of individual differences in language use and language acquisition. *Dutch Journal of Applied Linguistics*, *9*(1-2), 21-37. https://doi.org/10.1075/dujal.19027.hul

Hulstijn, J. H., Young, R. F., Ortega, L., Bigelow, M., DeKeyser, R., Ellis, N. C., Lantolf, J. P., Mackey A. & Talmy, S. (2014). Bridging the gap: Cognitive and social approaches to research in second language learning and teaching. *Studies in Second Language Acquisition*, *36* (3), 361- 421. https://doi.org/10.1017/S0272263114000035

Jordan, G. (2004). *Theory Construction in Second Language Acquisition*. John Benjamins.

Karimi-Aghdam, S. (2016). Rethinking Vygotskian cultural-historical theory in light of Pepperian root metaphor theory: Dynamic interplay of organicism and contextualism. *Human Development*, *59*(5), 251-282. https://doi.org/10.1159/000452719

Karimi-Aghdam, S. (2017). Zone of proximal development (ZPD) as an emergent system: A dynamic systems theory perspective. *Integrative Psychological and Behavioral Science*, *51,* 76-93. https://doi.org/10.1007/s12124-016-9359-1

Karimi-Aghdam, S. (2024). *Dynamic systems theory and second language studies: A Pepperian reading*. Paper presented at the annual conference of the American Association for Applied Linguistics (AAAL 2024), Houston, Texas, USA (March 18).

Kinginger, C. (2001). i + 1 ≠ ZPD. *Foreign Language Annals,* 34(5), 417-425. https://doi.org/10.1111/j.1944-9720.2001.tb02081.x

Kissling, E. (2023). Can concept-based language instruction change beginning learners' aspectual development?: Preliminary experimental evidence that novice learners taught boundedness are less influenced by lexical aspect. *Journal of Applied Linguistics and Applied Literature: Dynamics and Advances*, 11(2), 63-84. https://doi.org/10.22049/jalda.2023.27948.1447

Krashen, S. (1982). *Principles and Practice in Second Language Acquisition*. Oxford University Press.

Kuhn, T. S. (1962). *The Structure of Scientific Revolutions*. University of Chicago Press.

Kuhn, T. S. (1970a). *The Structure of Scientific Revolutions,* (2nd edition, with postscript). University of Chicago Press.

Kuhn, T. S. (1970b). Logic of discovery or psychology of research. In Lakatos, I. & Musgrave, A. (Eds.). *Criticism and the Growth of Knowledge* (pp. 1-23). Cambridge University Press.

Kuhn, T. S. (1970c). Reflections on my critics. In Lakatos, I. & Musgrave, A. (Eds.). *Criticism and the Growth of Knowledge* (pp. 231-278). Cambridge University Press.

Kuhn, T. S. (1974). Second thoughts on paradigms. In F. Suppe (Ed.). *The Structure of Scientific Theories*, (pp. 459-482). University of Illinois Press.

Kuhn, T. S. (1977). Second thoughts on paradigms. In *The Essential Tension: Selected Studies in Scientific Tradition and Change* (pp. 293-319). University of Chicago Press.

Kuhn, T. S. (1982). Commensurability, comparability, communicability. In *PSA: Proceedings of the Biennial Meeting of the Philosophy of Science Association*, 1982(2), (pp. 668-688), Cambridge University Press. https://doi.org/10.1086/psaprocbienmeetp.1982.2.192452

Kuhn, T. S. (1990). Dubbing and redubbing: The vulnerability of rigid designation. In *Minnesota Studies in the Philosophy of Science*, edited by C. W. Savage, (pp. 298-318). University of Minnesota Press.

Lantolf, J. (1996). SLA Theory Building: "Letting All the Flowers Bloom!". *Language Learning*, *46*(4), 713–749. https://doi.org/10.1111/j.1467-1770.1996.tb01357.x

Lantolf, J. P. (2017). Materialist dialectics in Vygotsky's methodological framework: Implications for applied linguistics research. In C. Ratner, & D. N. H. Silva (Eds.): *Vygotsky and Marx: Toward a Marxist Psychology* (pp. 173-189). Routledge.

Lantolf, J. (2023). Reflections on the special issue and the significance of pre-paradigm thinking for the field of second language acquisition. *Journal of Applied Linguistics and Applied Literature: Dynamics and Advances*, 11(2), 205-231. https://doi.org/10.22049/jalda.2024.29542.1673

Lantolf, J. P., & Appel, G. (1994). Theoretical framework: An introduction to Vygotskian perspectives on second language research. In J. P. Lantolf & G. Appel (Eds.), *Vygotskian Approaches to Second Language Research* (pp. 1-32). Ablex.

Lantolf, J. P., & Frawley, W. (1984). Second language performance and Vygotskyan psycholinguistics: Implications for L2 instruction. In A. Manning, P. Martin, & K. McCalla (Eds.), *The Tenth LACUS Forum 1983* (pp. 425-440). Hornbeam Press.

Lantolf, J. P., & Karimi-Aghdam, S. (2020). Dialectical emergence of language and consciousness in society: JALDA's interview with professor James P. Lantolf:. *Journal of Applied Linguistics and Applied Literature: Dynamics and Advances*, *8*(2), 3-21. https://doi.org/10.22049/jalda.2020.27046.1241

Lantolf, J. P., & Poehner, M. E. (2014). *Sociocultural Theory and the Pedagogical Imperative in L2 Education*. Routledge/Taylor & Francis.

Lantolf, J. P., & Poehner, M. E. (2023). Sociocultural theory and classroom second language learning in the East Asian context: Introduction to the special issue. *The Modern Language Journal*, *107*(S1), 3-23. https://doi.org/10.1111/modl.12816

Lantolf, J. P., & Thorne, S. L. (2006). *Sociocultural Theory and the Genesis of Second Language Development*. Oxford University Press.

Long, M. H. (1990). The least a second language acquisition theory needs to explain. *TESOL Quarterly*, *24*(4), 649-66. https://doi.org/10.2307/3587113

Long, M. H. (1993). Assessment strategies for SLA theories. *Applied Linguistics, 14*(3), 225-249. https://doi.org/10.1093/applin/14.3.225

Long, M. H. (2007). *Problems in Second Language Acquisition*. Lawrence Erlbaum.

Masterman, M. (1970). The nature of a paradigm. In Lakatos, I. & Musgrave, A. (Eds.). *Criticism and the Growth of Knowledge* (pp. 59-89). Cambridge University Press.

McLaughlin, B. (1987). *Theories of Second Language Learning*. Edward Arnold.

McManus, K. (Ed.). (2024). *Usage in Second Language Acquisition: Critical Reflections and Future Directions* (1st ed.). Routledge. https://doi.org/10.4324/9781032668475

McMullin, E. (1976). The fertility of theory and the unit for appraisal in science. In R. S. Cohen, P. K. Feyerabend & M. W. Wartofsky (Eds.), *Essays in Memory of Imre Lakatos* (pp. 395-432). Springer Netherlands.

McMullin, E. (1982). Values in science. In *PSA: Proceedings of the Biennial Meeting of the Philosophy of Science Association* (Vol. 1982, No. 2, pp. 2-28). Cambridge University Press.

Negueruela, E. (2003). *A sociocultural approach to teaching and researching second languages: Systemic-theoretical instruction and second language development* [Unpublished doctoral dissertation]. The Pennsylvania State University, University Park.

Ohta, A. S. (2001). *Second Language Acquisition Processes in the Classroom: Learning Japanese*. Erlbaum.

Pearce, D. (1987). *Roads to Commensurability*. Reidel.

Poehner, M. E. (2008). *Dynamic Assessment: A Vygotskian Approach to Understanding and Promoting Second Language Development*. Springer Publishing.

Reichenbach, H. (1938). *Experience and Prediction*. University of Chicago Press.

Rosborough, A., & Wimmer, J. (2023). Vygotskian sociocultural theory for second language learners: Addressing in/commensurabilities with popular school-based curricula. *Journal of Applied Linguistics and Applied Literature: Dynamics and Advances*, 11(2), 183-204. https://doi.org/10.22049/jalda.2024.28049.1474

Sankey, H. (1993). Kuhn's changing concept of incommensurability. *British Journal for the Philosophy of Science*, *44*(4), 759-774. https://doi.org/10.1093/bjps/44.4.759

Siekmann, S., & Parker Webster, J. (2023). A diffractive reading of multiliteracies, participatory teacher action research and cultural historical activity theory: Entanglements and insights in indigenous language teaching. *Journal of Applied Linguistics and Applied Literature: Dynamics and Advances*, 11(2), 107-131. https://doi.org/10.22049/jalda.2024.28038.1473

Shapere, D. (1964). The structure of scientific revolutions. *The Philosophical Review, 73*(3), 383–394. https://doi.org/10.2307/2183664

Schumann, J. H. (1983). Art and science in second language acquisition research. *Language Learning*, *33*(5), 49-70. https://doi.org/10.1111/j.1467-1770.1984.tb01324.x

Schumann, J. H. (1993). Some problems with falsification: An illustration from SLA research. *Applied Linguistics*, *14* (3), 295-306. https://doi.org/10.1093/applin/14.3.295

Stam, G. (2018). Gesture as a window onto conceptualization in second language acquisition: A Vygotskian perspective. In J. P. Lantolf & M. E. Poehner (Eds.) with M. Swain, *Routledge Handbook of Sociocultural Theory and Second Language Development* (pp. 165-178). Routledge.

Suppe, F. (1984). Beyond Skinner and Kuhn. *New Ideas in Psychology*, *2*(2), 89-104. https://doi.org/10.1016/0732-118X(84)90012-6

The Douglas Fir Group. (2016). A transdisciplinary framework for SLA in a multilingual world. *The Modern Language Journal*, *100*(S), 19-47. https://doi.org/10.1111/modl.12301

Thorne, S. L., & Lantolf, J. P. (2007). A linguistics of communicative activity. In S. Makoni & A. Pennycook (Eds.), *Disinventing and Reconstituting Languages* (pp. 170-195). Multilingual Matters.

Toomela, A. (2008). Commentary: Vygotskian cultural-historical and sociocultural approaches represent two levels of analysis: Complementarity instead of opposition. *Culture & Psychology, 14*(1), 57-69. https://doi.org/10.1177/1354067X07085812

Toomela, A. (2015). Methodology of cultural-historical psychology. In A. Yasnitsky, R. van der Veer, & M. Ferrari (Eds.), *The Cambridge Handbook of Cultural-Historical Psychology* (pp. 101-125). Cambridge University Press.

Urbanski, K. B. (2023). *Second Language Literacy Pedagogy. A Sociocultural Theory Perspective*. Multilingual Matters.

Valsiner, J., & van der Veer, R. (2014). Encountering the border: Vygotsky's *zona blizhaishego razvitia* and its implications for theories of development. In A. Yasnitsky, R. van der Veer, & M. Ferrari (Eds.), *The Cambridge Handbook of Cultural-Historical Psychology* (pp. 148-173). Cambridge University Press.

van Compernolle, R. A. (2014). *Sociocultural Theory and L2 Instructional Pragmatics*. Bristol: Multilingual Matters.

van Compernolle, R. A. (2015). *Interaction and Second Language Development: A Vygotskian Perspective*. Amsterdam: John Benjamins. https://doi.org/10.1075/lllt.44

van Lier, L. (1994). Forks and hope: Pursuing understanding in different ways. *Applied Linguistics*, *15*(3), 328-346. https://doi.org/10.1093/applin/15.3.328

Vygotsky, L. S. (1986). *Thought and Language.* MIT Press.

Wertsch, J. (1981). *The Concept of Activity in Soviet Psychology*. Sharpe.

Wertsch, J. (1985). *Vygotsky and the Social Formation of Mind*. Harvard University Press.

White, B., & Masuda, K. (2023). Integration and compatibility of sociocultural theory and cognitive linguistics for second language lexicogrammar instruction. *Journal of Applied Linguistics and Applied Literature: Dynamics and Advances*, 11(2), 85-106. https://doi.org/10.22049/jalda.2024.28052.1476

**Notes**

---

[1] Following Ellis (2021), we use 'second language acquisition' (SLA) to refer to the scientific field of inquiry and following Lantolf (this issue) use 'second language development' (L2 development) to refer to the process which is the object of scientific inquiry.

[2] Citing Masterman (1970) who had drawn up 'a partial analytic index' of the term 'paradigm' used in Kuhn's book SSR, Kuhn (1970a, p. 181, emphasis added) asserts that the term 'paradigm' is used in 'at least *twenty-two* different ways' whereas Masterman (1970) herself contends that "On my counting, he [Thomas Kuhn] uses 'paradigm' in not less than *twenty-one* different senses in his [1962], possibly more, not less" (p. 61; emphasis added). Kuhn (1977, p. 294) repeats the same number of

usages of the term 'paradigm' in the aforesaid book ('twenty-two different usages') when he refers to Masterman's (1970) critical piece.

[3] The concept of 'incommensurability' was used by both Thomas Kuhn and Paul Feyerabend in the early 1960s independently of one another. The construal of the term is treated differently by Kuhn (1962) and Feyerabend (1962). In this article we do not intend to discuss Feyerabend's reading of incommensurability nor do we purport to compare these two scholars' viewpoints about the term. Those interested in further exploring this topic may refer to Hoyningen-Huene (2004).

[4] "Scientific realism says that the entities, states and processes described by correct theories really do exist …Theories about the structure of molecules that carry genetic codes are either true or false, and a genuinely correct theory would be a true one." (Hacking, 1983, p. 21).

[5] The real discordance between ZPD and i+1, and conceivably between Krashen's Monitor Model and Vygotsky's SCT, is between primacy of individual vis-a-vis primacy of the collective/social. In psychology it is a common assumption that the collective is comprised of individuals (i.e., individual is fundamental, and the social/collective is derivative) whereas in SCT the assumption is that the individual emerges from the collective (the social/collective is fundamental, and individual is derivative) (J. P. Lantolf, personal communication, May 13, 2024).

[6] What 'comes next' for Krashen is based on a linear unfolding of the internal syllabus of a passive L2 learner whereas 'what comes next' for Vygotsky is dynamically co-constructed by an agentive L2 learner based on empirical evidence obtained from dialogue in the ZPD as the mechanism of development (J. P. Lantolf, personal communication, May 13, 2024).

[7] As our discussion here patently shows, our perspective on science, nature of data, scientific change, theory choice, scientific methodology, and appraisal of competing theories when it comes to SLA and L2 development does not fully accord with the perspective of those SLA researchers (e.g., Beretta, 1991; Long, 1993; Gregg, 2003; Gregg, Long, Jordan, & Beretta, 1997) who invoke various resonances of (logical) positivism or its philosophical and methodological descendants in approaching SLA matters.

[8] Concurring with Kuhn's viewpoint, we maintain that an SLA theory as a whole (not experimental hypotheses derived from it) is non-falsifiable, or at least it is extremely difficult to categorically falsify an SLA theory. This does not necessarily mean that we subscribe to a relativist view of science, nor does it mean that we gloss over the demarcation criteria that distinguish science from pseudoscience. We hold that attempting to falsify experimental and scientific hypotheses should be a primary goal for SLA inquiries.

[9] It needs to be acknowledged that the issue of 'scientific rationality' vis-à-vis 'scientific relativism' in the 1990s was, and with reduced momentum still is, the subject of extensive debate in SLA (e.g., Block, 1996; Beretta, 1991; Ellis, 2010; Gregg, Long, Jordan, & Beretta, 1997; Hulstijn, 2014; Jordan, 2004; Lantolf, 1996; Long, 1990, 1993, 2007; van Lier, 1994). This is not the place to provide a detailed exposition of this issue. Our viewpoint, nevertheless, is that one does not need to subscribe wholesale to either of these dichotomized perspectives on SLA.

## Authors' Biographies

**Saeed Karimi-Aghdam** (PhD, University of Jyväskylä) is Associate Professor of English Language and Didactics at the Faculty of Education and Arts, Levanger Campus, Nord University. He is a member of the editorial boards of *Language and Sociocultural Theory* and the *Journal of Applied Linguistics and Applied Literature: Dynamics and Advances*. His main research interests include Vygotskian cultural-historical psychology, second language acquisition, TESOL, and dynamic systems theory, and his work has appeared in journals such as *Human Development*, *Applied Linguistics*, *Language and Sociocultural Theory*, *Integrative Psychological and Behavioral Science*, and *Nordic Journal of English Studies*.
E-mail: saeed.karimi.aghdam@nord.no



**Rémi A. van Compernolle** (PhD, The Pennsylvania State University) is Associate Professor of Applied Linguistics and Second Language Acquisition and the Associate Head of the Department of Languages, Cultures and Applied Linguistics at Carnegie Mellon University. His research is grounded in Vygotskian cultural-historical psychology and focuses on second language development, with an emphasis on interaction, sociolinguistics, and pragmatics in language teaching and assessment. E-mail: vancomp@cmu.edu