



## **L2 Motivation as Seen Through the Lenses of Sociocultural Theory and Complexity/Dynamic Systems Theory: Are They Commensurable?**

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### **Abstract**

Research on motivation in second language (L2) learning has progressed tremendously over the last several decades. Within the recent trend to investigate the socially situated context of motivation and the role of social processes in shaping individual L2 motivation, Sociocultural Theory (SCT) and Complexity / Dynamic Systems Theory (CDST) stand out in their contributions. Although researchers have attempted to combine SCT and CDST, there is an ongoing debate in the field of Applied Linguistics regarding the general compatibility of these two traditions. This article consists of a critical literature and theoretical review concerning how SCT, focusing on Activity Theory (AT), and CDST, focusing on the L2 Motivational Self System, address L2 motivation. We argue that SCT and CDST appear to be compatible superficially, since both portray L2 motivation as dynamic, complex, and arising through interactions between individuals and their environments. However, through a more in-depth examination, fundamental differences emerge not only in the context of L2 motivation, but also in the guiding theoretical principles of each research tradition. Ultimately, and arguing from an SCT perspective, we offer a critique of CDST and posit that these theories are not commensurable in their view of L2 motivation or in general.

*Keywords:* sociocultural theory, complexity/dynamic systems theory, activity theory, motivation

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## Introduction

For more than five decades, motivation has been of research interest within the field of Second Language Acquisition (SLA), with a much longer history in mainstream and educational psychology. With this long history and interest, “no single individual difference factor in language learning has received as much attention as motivation” (R. Ellis, 2008, p. 677). Research on motivation in language learning has progressed tremendously over the past two decades, transcending the dominant socio-psychological paradigm and its positivistic, psychometric approach toward more robust theoretical perspectives that consider the cognitive and contextual aspects of motivation. Evolving in conjunction with developments in mainstream motivational psychology, Dörnyei and Ushioda (2021) identified these phases of second language (L2) motivation research: the social-psychological period (1959–1990), characterized by the work of Robert Gardner and his colleagues (see Gardner & Lambert, 1972); the cognitive-situated period (during the 1990s), based on cognitive theories in educational psychology (see Crookes & Schmidt, 1991; Dörnyei, 1994) (also known as the educational shift); the process-oriented period, occurring at the turn of the century, characterized by a focus on motivational change and the temporal dimension of motivation (see Dörnyei & Ottó, 1998); and the socio-dynamic period (current), characterized by a concern with complex dynamic systems and contextual interactions.

Although research efforts were proposed to address the shortcomings of Gardner’s (1985) model, the paradigm for understanding L2 motivation remained fundamentally the same: based on individualistic, positivistic, cross-sectional, and psychometric perspectives. Rueda and Moll (1994) offered a critique by claiming that many existing motivation studies were “limited in that they conceptualize motivation as an individual ‘in-the-head’ phenomenon, with little or no attention paid to the sociocultural context and the interpersonal processes within which individual activity occurs” (p. 117). Valsiner and van der Veer (2000) argued that prior work considered L2 motivation as the sum of subcomponents such as instrumentality, attitudes, and integrative motives. In addition, as some scholars have suggested (e.g., Goldberg & Noels, 2006; Kim, 2005, 2016), downward reductionism and a positivistic bias is still prevalent in L2 motivation research as motivation is viewed predominantly as a general psychological construct (Al-Hoorie, Hiver, Kim, & De Costa, 2021).

With L2 motivation often characterized as a stable characteristic, there is growing interest in the contextual aspects of motivation and in the significant role of social processes in shaping individual motivation. As such, scholars have explored two promising alternative<sup>1</sup> perspectives (see Atkinson, 2011) to help capture the complexity of L2 motivation: Sociocultural Theory (SCT), particularly drawing upon Activity Theory (AT) and more recently with the concept of *perezhivanie*, and Complexity / Dynamic Systems Theory (CDST), particularly drawing upon Dörnyei’s (2009) L2 Motivational Self System. From each perspective, L2 learning motivation is not seen as a static final product but rather as a dynamic, unpredictable, changing, and unique process. Researchers within each tradition argue that their respective theoretical orientation has ecological validity and the

potential to remedy the division in L2 motivation research between downward and / or upward reductionism.

In exploring the question of “what [and in what way – D.L.] moves people to act, think and develop” (Deci & Ryan, 2008, p. 14, as cited in D. A. Leontiev, 2012b, p. 65), this critical literature and theoretical review explores two perspectives, SCT and CDST, in their treatment of L2 motivation. Although some work has been done to explore the theoretical compatibility between SCT and CDST in general (e.g., Karimi-Aghdam, 2016, 2019; McCafferty, 2016), little attention has been paid to L2 motivation within the ongoing debate, with notable exceptions (e.g., Al-Hoorie, Hiver, Kim, & De Costa, 2021; Kim, 2009, 2016; Kimura, 2014, 2023). In this article, we address the following questions:

1. How does each perspective construe (L2) motivation? In regard to L2 motivation, what are the similarities and differences between these perspectives?
2. Are SCT and CDST commensurable in their treatment of L2 motivation?

## Methods

### Critical Literature and Theoretical Review

The purpose of this article is to explore and compare how L2 motivation is understood and interpreted from an SCT and CDST perspective. This article discusses existing research on the construct of (L2) motivation and aims at contributing towards the ongoing conversation regarding the commensurability of SCT and CDST. To accomplish this, we conducted a critical literature and theoretical review following Cooper’s (2015) systematic review protocol for synthesizing research in the social sciences. This protocol consists of seven steps: 1.) formulating the problem; 2.) searching the literature; 3.) gathering information from studies; 4.) evaluating the quality of studies; 5.) analyzing and integrating the outcomes of studies; 6.) interpreting the evidence; and 7.) presenting the results.

After formulating the problem (i.e., how L2 motivation is understood and interpreted in SCT and CDST), we used combinations of nine search terms to locate publications related to the research questions (*Motivation, Sociocultural Theory, Cultural-Historical Psychology, Activity Theory, (Complexity) / Dynamic Systems Theory, L2 Motivational Self System, Second Language Acquisition, Second Language Learning, and Second Language Teaching*) in three online databases: Academic Search Premier, ERIC, and Google Scholar. We decided to search the literature available on these databases, as opposed to those published in specific journals, to be inclusive of research studies that have been disseminated in different contexts, genres, and venues. These results were then narrowed using the following inclusion and exclusion criteria: 1.) published in peer-reviewed journal articles, books, edited volumes, or dissertations; 2.) focused on L2 learners and learning; and 3.) published around the turn of the century (i.e., 2000). Following, we further excluded studies that drew on the construct motivation, but did not use an SCT or CDST lens to examine the data, and studies that focused on motivation but did not

focus on the L2 learner (e.g., language teachers; see for example Hiver, Kim, & Kim, 2018). This search yielded 55 results which span the years 1998 - 2023 and are drawn from a variety of outlets, research methods, and contexts, both within and outside of the United States. In the reference list generated at the end of this article, references marked with an asterisk (\*) indicate those examined in this review.

Once these studies were selected, we began to both gather information from the studies and engaged in qualitative content analysis (cf. Mayring, 2000). Hsieh and Shannon (2005) define qualitative content analysis as “a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns” (p. 1278). Qualitative content analysis was chosen because of its use of inductive category development and deductive category application in light of our research questions (Cho & Lee, 2014; Mayring, 2000). Additionally, it allowed for flexibility as we critically reviewed conceptual and theoretical arguments made to both showcase and compare each perspective’s treatment of L2 motivation and also to generate claims about the commensurability of each perspective’s treatment of L2 motivation. This study generated several different themes (to be discussed below): philosophical foundations; unit of analysis; role of history, role of context and culture; and view of agency.

The following sections present our report of the main findings from our analysis and our interpretation of the evidence. We begin this critical literature and theoretical review by discussing how L2 motivation is viewed from the perspective of SCT and focus primarily on the contributions of AT. While recent scholarship within SCT has discussed *perezhivanie* as a concept and theoretical unit of analysis (e.g., Lantolf & Swain, 2019; Veresov, 2017), which we will introduce briefly in this article, we have selected to focus primarily on AT. This focus stems from the fact that earlier studies addressing the construct of L2 motivation from an SCT perspective (e.g., Kim, 2005a, 2011; Lantolf & Genung, 2002) have done so through the lens of AT. In addition, there have been attempts to directly compare and / or relate the theoretical compatibility of SCT and AT to CDST in terms of L2 motivation (Kim, 2009, 2016; Kimura, 2014). Next, we offer an overview of key principles from CDST and its contributions to the study of L2 motivation. Here, we refer to contextual CDST as opposed to dialectical CDST (for a distinction, see Karimi-Aghdam, 2016). Following, we compare these two perspectives in order to determine whether or not their treatment of L2 motivation may be seen as commensurable. Ultimately, and from an SCT perspective, we offer a critique of contextual CDST and argue that these theories are not commensurable in their view of L2 motivation or in general.

### **Author Positionality**

It is important in writing this conceptual and theoretical piece that we make transparent how we relate to and engage with the research topic. Through this writing, it is made evident how we position SCT and CDST with each other in light of our own respective histories and scholarly identities.

### **Author 1**

Author 1's research interests are grounded in Vygotskian SCT and centered around language teacher cognition and identity, second language teacher education (SLTE) pedagogy and practice, language teacher professional development, and SLA. SCT is the lens through which he sees the world, conducts his research, and frames his thinking and activity as a teacher educator and scholar. Working with teachers and teacher educators, he is interested in understanding how each perspective brings about new insights to the activity of teaching-and-learning.

### **Author 2**

Author 2's research is situated at the intersection of bilingual education, im/migration, and language and literacy development from a sociocultural perspective. As a former English as a foreign language teacher, Author 2's training as a language educator and prior research engagement in the field of Applied Linguistics was grounded in SCT. Working closely with K-12 educators through ethnographic research in bilingual education programs in the U.S., she is interested in understanding how issues of theoretical (in)commensurability among prominent research traditions in the field of language education affect everyday classroom instruction.

## **Critical Literature and Theoretical Review**

### **Key Tenets of Activity Theory**

Vygotskian Cultural-Historical Psychology (CHP; Vygotsky, 1978), often called Sociocultural Theory (SCT; Lantolf & Thorne, 2006) in L2 research, is a theory of mind "that recognizes the central role that social relationships and culturally constructed artifacts play in organizing uniquely human forms of thinking" (Lantolf, 2004, pp. 30-31). Vygotsky (1978) argued that "human learning presupposes a specific social nature and a process by which children grow into the intellectual life of those around them" (p. 88). This signifies that how people learn and develop, and the kinds of knowledge they develop, are intricately connected to the goal-directed social activities and contexts in which the experience occurs. The unit of analysis for the study of development is not simply the individual acting alone but rather the "the interpersonal functional system formed by people and cultural artifacts jointly to bring about development" (Poehner & Lantolf, 2005, p. 238).

Within SCT, Lantolf and Genung (2002) and Kim (2005a, 2005b, 2009) have pointed to the usefulness of incorporating the descriptive and analytic framework of Activity Theory (AT) specifically to the study of L2 learning and motivation (see also Coughlan & Duff, 1994; Lantolf & Pavlenko, 2001). AT presents an alternative to reductionist and positivistic paradigms to L2 motivation by providing a more integrated and comprehensive framework (Kim, 2005a). While some work has been done to apply AT to these endeavors, the motivational dimension of SCT remains relatively under-scrutinized with regard to L2 learning (Kim, 2005a, 2005b). This, however, is not the case with regard to SCT in general and to the psychology of motivation. For this reason, this section will first review

motivation more broadly within SCT and AT, and then zoom in on the few existing empirically-based L2 studies which centralize motivation and L2 learning. Following, we briefly address the concept of *perezhivanie* as it is understood and applied to L2 learning more recently.

The origins of AT, an extension of SCT, are found in Vygotsky's central tenet that human consciousness is mediated through culturally-constructed mediational means which themselves have been developed culturally and historically<sup>2</sup>. There have been three major iterations of AT<sup>3</sup> (see Engeström, 2001; Lantolf & Thorne, 2006), and we focus in this article on the third generation (Engeström, 1987, 1999), commonly referred to as Cultural-Historical Activity Theory (CHAT). The first two iterations of AT were presented as triadic models in which the subject (an agent carrying out the activity) pursued an object (goal) through the mediation of artifacts (tools). Building on the work of A. N. Leont'ev (1978), the third generation of AT emphasizes that human activity is directed toward objects, and that actions towards those objects are mediated by the elements of the activity system, namely, the community, its cultural norms and values (rules), physical and symbolic mediating artifacts, and the expected division of labor within the system. Human activity, then, "arises from concrete, historically formed motives and is always goal-directed and, most importantly, dynamic" (Lantolf & Genung, 2002, p. 191). With these relations brought to the surface, how an individual (i.e., subject) enacts agency within a larger social structure is foregrounded, as well as on how the "internal contradictions within activity systems might act as generators of change" (V. Ellis, Edwards, & Smagorinsky, 2010, p. 3).

From this perspective, motivation is not located solely within an individual but is constructed and constrained by the context and emerges and evolves as individuals participate in goal-directed activity. As D. A. Leontiev (2012a) noted, "a person's interaction with the world mediated by culturally transmitted tools, rather than inborn potentialities or environmental pressures, is considered the source of mental and personality development, the source of human motivation." (p. 15). Individuals are socioculturally embedded actors (not processors or system components). Or, as Daniels (2001) put it, "the individual and the cultural should be conceived of as mutually formative elements of a single, interacting system" (p. 84).

For D. A. Leontiev (2012b), human motivation "refers to the field covering all the psychological structures and processes that make human activity happen" (p. 66). Within AT, D. A. Leontiev (2012b) centered personal meaning<sup>4</sup> as energizing and explaining the dynamic qualities of motivational processes. Here, personal meaning, or sense, (i.e., *smysl*) is seen as distinct from cultural meaning (i.e., *znachenie*). According to Vygotsky (1987), cultural meaning (*znachenie*) is the meaning for which there is consensus across individuals within a cultural group (i.e., dictionary definition). Words and concepts, however, accrue personal, idiosyncratic meaning according to an individual's experiences (*smysl*). D. A. Leontiev (2012b) distinguished these concepts based on two features: 1) *context dependence*, defined as how "something has meaning for a person only within some meaningful context" (D. A. Leontiev, 2012, p. 67) and changing the context would then change the meaning of the same action, image or utterance; and 2) *intentional or transcendent*

*quality*, defined as how “personal meaning unifies the person to the world, and the world to the person’s subjective experience; personal meaning implies the potential for activity and is thus regulating this activity” (D. A. Leontiev, 2012b, p. 67).

In AT, the unit of analysis is the activity itself (see Lantolf & Thorne, 2006). Activities are composed of goal-directed actions that are undertaken to fulfill the object. Most human activity has multiple motives, with a motive being defined as “an internal characteristic of the structure of an activity” (Markova, 1990, p. 23). This motive changes and is transformed as the activity is developed. When a need meets an object, a motive arises and the motive is what puts energy into the system to impel the person to act. However, the level of commitment to fulfilling a motive can vary, and this is where motivation comes into play as motives are impacted by the level of motivation. According to Markova (1990), motivation is “the realization of motives” (p. 28). A motive has three main functions: it is driving, directing, and sense-forming (D. A. Leontiev, 2012b). The latter underlies any motive and without the sense-forming function, it is impossible to preserve the driving and directing functions of a motive. An individual can maintain movement toward a motive by shifting a goal. In addition, it depends on how much sense it makes for an individual to do something, and this affects whether or not the driving and directing functions are sustained. Therefore, A. N. Leont’ev’s (1978) AT “is a meaningful relationship rooted in the being-in-the-world that connects a person with a situation” (D. A. Leontiev, 2012b, p. 71).

### ***An SCT Perspective to L2 Motivation Research***

AT has been applied to L2 learning and to L2 motivation in a variety of settings, including study abroad (Allen, 2010), high school (Song & Kim, 2017), and university contexts (Li, 2021). One of the earliest studies is Lantolf and Genung (2002). This study investigates the activity system of a graduate student enrolled in a summer intensive Chinese as foreign language course in order to fulfill her language requirement for her doctoral degree. The focal participant, PG, was a colonel in the U.S. Army, a fluent speaker of German with extensive experience in several languages, had lived in Germany for several years, and was conducting her doctoral research on the acquisition of German as an L2. The student, because of her negative reactions to the organizational structure of the Chinese language classroom, was not motivated to learn Chinese for communicative purposes (her original motive), but rather to fulfill the language requirement for her doctoral degree. The pedagogical approach adopted in this particular Chinese language classroom (an audio-lingual method) and the teaching techniques incorporated by the L2 teacher did not correspond to PG’s ideal of language learning. Because of this, PG’s motive for participation was reformulated toward that of simply passing the course. From an AT perspective, motives emerge in the process of activity and are shaped by sociocultural contexts with a “necessary, dialectic, link between individuals and social structures” (Lantolf & Genung, 2002, p. 176).

In another representative study, for Kim (2006), motivation for L2 learning results from the alignment of a motive and goal with a sense of participation (see Lave & Wenger, 1991) in a community of practice. This participation relates not



only to physical involvement in the learning situation (as participation may only be peripheral), but also to imaginary involvement. Kim (2006) conducted a 10-month longitudinal emergent case study of five Korean Adult English as a second language (ESL) students living, working, and studying English in Canada and their changing motivations over time with regard to L2 learning. Here, Kim defines L2 motivation “as an L2 learner’s realization of personal significance of an L2-related activity, resulting from the L2 learner’s sense of participation in L2 activity systems” (p. 55). The author found that the integration resulted in sensitization points, defined as “the moment when an L2 learner recognizes the gap between his or her current L2 proficiency and the desirable L2 proficiency to be attained” (p. 65). Kim’s research demonstrated that L2 learners’ sensitization resulted in the creation, maintenance, and / or termination of L2 learning motivation, and the sensitization reflects the dialectical and mediational process between the learner and their personal histories and the context (real or imaginary).

Kim (2011; see also Kim, 2013; Kim & Kim, 2013) also demonstrates that it is not necessarily “demotivating factors” or the context per se, but rather, the L2 learners’ perception of these factors that influences the L2 learning process. Kim (2011) examined the longitudinal trajectories of two highly-skilled Korean ESL immigrants’ L2 learning motivation to investigate the inseparable relationship between each individual’s prior lived experiences (i.e., their histories), their perceptions of their current sociocultural surroundings, and their impacts on L2 learning motivation. Although these L2 learners were located in similar ESL contexts, one learner perceived and believed the context as beneficial to L2 learning and their personal goals for ESL learning and obtaining a job, whereas the second learner did not fully recognize the affordances of living in an English-language context and gradually became demotivated after, among other external forces, several failed attempts to obtain a job interview and their belief in the superiority of native English speakers. In other words, the second participant had difficulty in finding personal meaning in their L2 related experiences. This understanding of motivation foregrounds learner beliefs and agency, which links motivation to action and motive. As such, agency is a co-constructed phenomenon, constantly renegotiated with those around the individual (Lantolf & Pavlenko, 2001) and posited as a key factor in the development and maintenance of motivation (Kim, 2007). L2 learners are viewed as historical agents who “actively engage in constructing the terms and conditions of their own learning” (Lantolf & Pavlenko, 2001, p. 145). In addition, as shown in Kim (2011), humans endow their environment with ideal properties which help determine the type of activity in which they participate (see Ilyenkov, 2014). This ideal is constructed as individuals participate in social life and is materially present.

While AT offers an alternative and holistic perspective to the study of human interaction in its situated sociocultural surroundings, it has received criticism for its implications in understanding human personality and subjectivity (see González Rey, 2015, 2016; Stetsenko, 2013). In addition, AT has been criticized for its use of activity not only as the unit of analysis but also as the theoretical and explanatory principle (see Kozulin, 2005). Vygotsky recognized that to study



something as complex as human consciousness required a unit of analysis that reflected the object of study. Initially, Vygotsky proposed the unity of thinking and speaking, captured in word meaning, as the unit of analysis. In later writings, recognizing that verbal thinking represented only one part of the overall picture, Vygotsky conceptualized *perezhivanie* as the theoretical unit of analysis of individual consciousness in the development of human personality (Veresov, 2017). *Perezhivanie* captures not only the dialectical unity of cognition-and-emotion, but also the dialectical unity between an individual and the social situation in which they are engaged (see Lantolf, 2021; Lantolf & Swain, 2019). This relationship is captured in the concept of the “social situation of development” (Vygotsky, 1994) in which the environment is refracted through the prism of an individual’s already developed psychology and defined as the “dynamic system of relations and interactions” between a given individual and the social environment (Veresov, 2017, p. 52). As Lantolf (2021) noted, “Vygotsky distinguishes between an objective social situation, which would be open to inspection to a third party and a subjective social situation, which is how that objective circumstance is refracted through the psychological system of the individual(s)” (p. 2). The same social environment is not only refracted through, and therefore impacts on, different individuals in different ways, but also at different phases of the individual’s development. At the same time, as a dialectic, the individual also contributes to the formation of the environment. *Perezhivanie*, then, as a theoretical concept, is inseparably linked to the social situation of development. With this, future studies exploring human motivation from an SCT perspective should consider this concept and unit of analysis.

### **Key Tenets of Complexity/Dynamic Systems Theory**

Although Complexity/Dynamic Systems Theory (CDST) was originally developed within the natural sciences, it has also been adopted by several disciplines that range from meteorology and ornithology, to many others in the social sciences, including law (Rosmawati, 2014). CDST’s integration into the field of developmental psychology occurred only recently, in the 1990’s, with the publication of the seminal works of Thelen and Smith (1994, 2006). Ever since, scholars have advocated for a broader application of CDST perspectives to understanding, for example, second language acquisition (Larsen-Freeman, 2006; 2007), cognitive and behavioral development (Perone & Simmering, 2017; van Geert, 2011), and identity development (Kaplan & Garner, 2017). For Rosmawati (2014), this theory’s appeal among scholars from various fields stems from its ability to generate new insights to account for change and growth in dynamically developing systems, as well as offer new conceptual abstractions and tools (Rosmawati, 2014). In Applied Linguistics, Larsen-Freeman (2012) argued that CDST offers the potential to contribute a transdisciplinary theme that transcends traditional disciplinary bounds and generates creative forms of inquiry into language and language development.

In the field of SLA, authors have outlined the benefits and promises of leveraging CDST in the study of L2 phenomena. For example, de Bot et al. (2013) argued that CDST “has the potential to connect *middle-level* theories that tend to

focus on social, contextual, or cognitive issues in relative isolation” (p. 200). According to the authors, this is due to the fact that CDST’s principles hold for aspects of the language user and language development at different levels of granularity. Similarly, Rosmawati (2014) positioned CDST as a promising meta-theory that can bridge the gap between behaviorist and interactionist perspectives and form a more cohesive approach to language acquisition. Waninge, Dörnyei, and de Bot (2014) argued that the CDST framework brings a twofold contribution to the analysis of SLA data. First, it allows researchers to identify relatively stable phases and patterns within the variation of the system’s behavior. Second, CDST acknowledges that the context in which a system’s behavior occurs is part of the developing system, instead of being simply a background variable. Along these lines, Hiver, Al-Hoorie, and Evans’ (2021) scoping review of over 150 research reports grounded in CDST outlined prominent contributions of the studies within this tradition. For example, these studies were able to describe various complex systems, demonstrate the existence of dynamic regularities in development, and foreground the role of context in understanding development.

In CDST-oriented research, it is first necessary to identify whether, or to what extent, the object under study can be justifiably conceived of as a complex system. For a system to be considered *complex*, it must present at least two interrelated components, although typically it is composed of multiple entities. van Geert (2011) explained that the interaction between the interrelated components of a complex system changes their individual properties and generates properties on a macroscopic level, that is, “a level that exceeds the events on the level of the individual components or that cannot be reduced to the sum of such events” (p. 274). This perspective is echoed by Larsen-Freeman (2012) who explained that the complexity of complex systems is not built into any single component, instead emerging from their interactions. A complex system’s behavior arises from the interactions of its elements or agents; engendering processes such as self-organization, or the spontaneous formation of more complex orders, and demonstrating creativity in such interdependent relations (Larsen-Freeman, 2012). Additionally, each component of a larger complex system may itself be a complex system, which leads to the existence of nested complex systems. This process may descend at various levels (Mercer, 2011) and result in fractal shapes (Rosmawati, 2014). Complex systems are also dynamic by nature, which means that all of the elements of a complex system (i.e. the system as a whole) and their interconnections are always changing due to internal forces and interactions with the environment (de Bot et al., 2013; Larsen-Freeman, 2012). Such changes can either occur gradually and smoothly over time, or be the result of larger perturbations, leading to dramatic and abrupt transformations. Another important characteristic of complex systems is *emergence*, which stems from observations (in the non-organic world) that complex systems allow unexpected patterns of behavior to emerge that transcend individual constituents (Kostoulas & Stelma, 2016). Emergence is considered a consequence of the heterogeneous nature of complex systems.

According to Dörnyei (2014), another important step in CDST research is to examine when, and to what extent, the targeted system’s behavior is at a point of

sufficient (temporary) stability so that it is feasible to investigate its aspects. This research strategy is needed in light of the profound differences between the main unit of analysis in social scientific research and the objects of study in the natural sciences. While in the natural sciences it is possible to reconstruct the movement of a system by applying mathematical computations, the dynamic situations found in the social sciences tend to be too complex and multi-layered for accurate results solely through mathematical modeling. This unpredictability is referred to as *nonlinear change* and indicates that a constellation of system components (i.e., how these entities work together) is what determines the system's behavioral outcome. However, it is also important to stress that several scholars working within CDST have diverged from this stance in their approach to social scientific research; and some scholars have relied on mathematical models to explain human developmental processes and trajectories (Molenaar & Campbell, 2009; van Geert, 1991).

A significant challenge faced by scholars working in CDST is how to operationalize such a dynamic approach in research terms since typical research paradigms in the social sciences tend to analyze variables in relative isolation (Dörnyei, 2014). Larsen-Freeman and Cameron (2008b) argued for a CDST research methodology that describes dynamic systems and behavior retrospectively. Specifically, although stability is not the norm, complex dynamic systems tend to self-organize and at times allow for the emergence of relatively stable prototypes. When this occurs, scholars can follow the methodological procedure of “working backwards,” pinpointing the main factors and forces that led to specific states. This process, referred to as retrodictive qualitative modeling (Dörnyei, 2014), is geared toward understanding salient patterns associated with typical system outcomes. Issuing generalizations or predictions of system behavior with certainty is not possible from this perspective; but retrodiction supports researchers in identifying patterns that are “fundamental enough to be useful in understanding the dynamics of a range of other situations” (Dörnyei, 2014, p. 89). However, we highlight that retrodiction is different from the process of studying *history* backwards, or tracing developmental histories, often implemented by researchers working within SCT. Using history in psychological research is not “an auxiliary feature but a basic approach to all research aimed at understanding higher mental processes” (Lantolf & Thorne, 2006, p. 28).

Dörnyei (2014) proposed three strategies for investigating complex dynamic systems, focusing on: 1) identifying strong attractor-governed phenomena; 2) identifying typical attractor conglomerates; and 3) examining typical dynamic outcome patterns. Hiver and Al-Hoorie (2016) proposed a blueprint of complexity considerations titled “the dynamic ensemble” that can inform the design and implementation of any CDST-informed research effort. This practical catalog brings questions that can be consulted at various stages of the research process to inform decisions, including operational, contextual, macro-system, and micro-structure considerations. Larsen-Freeman (2016) argued for the affordances of using a CDST perspective in classroom-oriented research to understand teaching and learning. This perspective compels researchers to orient to a classroom ecology as one complex dynamic system that is emergent from the interaction of various components (e.g.,

agents, properties of physical and temporal environment), comprises one of many systems nested within other systems, and is temporally and spatially situated. Larsen-Freeman indicated the potential of compatible research methods with CDST, including microdevelopment and ideodynamic approaches, social network analysis, design-based research that responds to the emergent features in an event and examines multiple dependent variables, practitioner-led action research that actively promotes perturbation into the system, and relational model building. Despite such developments, Hiver and Al-Hoorie (2019) commented on the limited methodological guidance that exists for researchers who intend to conduct CDST-informed research projects, since CDST research in the social sciences is often framed conceptually and not geared toward practical application or ensuring compatibility between empirical designs and theoretical tenets. On one hand, the authors elucidated how a range of methods, split along qualitative and quantitative lines, can be conceptually compatible and practically leveraged for CDST-informed research (Hiver & Al-Hoorie, 2019). On the other hand, they argued for a unifying transdisciplinary framework that integrates qualitative and quantitative methods as well as group-based and individual designs in future CDST research in Applied Linguistics (Hiver & Al-Hoorie, 2019; Hiver, Al-Hoorie, & Larsen-Freeman, 2022).

### ***A Complexity/Dynamic Systems Perspective to L2 Motivation Research***

Concerning research on L2 motivation, studies that leverage frameworks based on CDST are fairly recent. According to Waninge, Dörnyei, and de Bot (2014), the *educational shift* in the 1990's brought the notion of motivation as a situated construct, and highlighted its prominent temporal dimension. As a consequence of this paradigmatic shift, several *process models* were introduced (Williams & Burden, 1997; Dörnyei & Ottó, 1998), indicating a movement towards a more dynamic view of L2 motivation. However, these studies were still based on cause-effect relationships, in terms of efficient causality, and could not account for the singularities of the L2 motivational process. Waninge, Dörnyei, and de Bot (2014) argued that a dynamic systems approach seems to be an attractive alternative, since this framework can account for fluctuations in learners' motivational dispositions, bringing a key contribution to understandings of L2 motivation.

In CDST, L2 motivation is seen as a complex dynamic system, and thus presents variability and nonlinearity as some of its fundamental characteristics. As noted by N. C. Ellis and Larsen-Freeman (2006), "motivation is less a trait than fluid play, an ever-changing one that emerges from the processes of interaction of many agents, internal and external, in the ever-changing complex world of the learner" (p. 563). In a discussion about CDST research, and L2 motivation more specifically, Dörnyei, MacIntyre, and Henry (2015) argued that conceptualizing motivation in a more dynamic fashion was imminent after the 1990's educational shift. Embodying this approach, Papi and Hiver (2020) drew on CDST to examine six English learners' motivational trajectories and patterns of emergent stability at different stages of the language learning process through quasi-narrative accounts of their language learning trajectories generated during interviews. The authors found that adaptive or competitive interactions between value-, control-, and truth-related

motivations and the context in which they emerged led to specific motivational trajectories. This, in turn, shaped these learners' language-learning choices and experiences. Providing tangible, CDST-based recommendations and strategies to classroom educators, Bahari (2019) introduced a taxonomy of nonlinear dynamic motivation-based strategies (NDMSs) for L2 teaching, with the goal of fomenting motivation-oriented L2 teaching-learning contexts. According to the author, NDMSs are applied at three stages: 1) pre-motivational stage, including potential motivation diagnosis, dynamic compatibility, and nonlinear integration; 2) motivational stage, which is grounded in cultural, social, and psychological constructs and strategies at the individual level; and 3) post-motivational stage, including nonlinear dynamic reinforcement and appraisal procedures as well as scaffolding and feedback. Kiss and Pack (2022) leveraged network analysis to examine students' motivation to learn English for Academic Purposes at a university in China. They found that motivational factors that play central relational links may not be the most frequently cited by learners; this unpredictability (and thus the impossibility to locate universal [de]motivating factors) is related to the fact that "different motivational factors affect students differently because they are highly connected and contextualized" (p. 21). Additionally, the authors found that positive and negative motivational factors were strongly interconnected for the participants in the study, suggesting that it is their interaction that propels the dynamicity of the motivational system.

In CDST-oriented L2 motivation research, Dörnyei's (2009) "L2 Motivational Self System" has been influential. The L2 Motivational Self System was strongly influenced by Markus and Nurius' (1986) theory of "possible selves," a perspective that explicitly addresses the interconnected nature of the self-system and motivated behavior. Markus and Nurius' notion of possible selves represented "the individual's ideas of what they *might* become, what they *would like* to become, and what they are *afraid of* becoming" (Dörnyei, 2009, p. 11). Thus, their position on possible selves is notably future-oriented, which differs from the traditional view of possible selves as the summary of how the individual currently sees themselves based on past experiences. Moreover, self-relevant imagery occupies a key place in the possible selves theory. Self-relevant imagery involves tangible images and senses, that is, existing as a reality for the individual. The imagery component also marks the motivational function of future possible selves according to the principles of the self-discrepancy theory (Higgins, 1996). Precisely, individuals are motivated to reach a condition where their present idea of themselves matches their future possible selves (Dörnyei, 2009).

In their conceptualization, Dörnyei (2009) introduced L2 motivation as a part of the learner's self system. The author proposed three components that form the L2 Motivational Self System: *Ideal L2 Self*, *Ought-to L2 Self*, and *L2 Learning Experience*. The first component, the *Ideal L2 Self*, refers to the attributes that one would ideally like to have in the context of L2 learning (i.e. the person one would like to become speaks an L2). As Dörnyei (2009) pointed out, "the ideal L2 self is a powerful motivator to learn an L2 because of the desire to reduce the discrepancy between our actual and ideal selves." (p. 29). The second component, *Ought-to L2 Self*, concerns the attributes that one believes one ought to possess to meet external

expectations, such as social and familial, and to avoid possible negative outcomes. According to Dörnyei and Chan (2013), the *Ought-to L2 Self* takes into account one's perceived duties and obligations as well as others' expectations, which may, at times, have little to do with one's own desires. Papi (2010) found that the *Ought-to L2 Self* significantly contributed to anxiety in a study informed by the survey answers of over 1,000 Iranian adolescent learners of English. Dörnyei and Chan (2013) drew on the survey answers of 172 Chinese students (ages 13-15) to explore the links among learner characteristics, L2 self-guides (ideal and ought-to L2 selves), and learning achievement in English and Mandarin. The authors found that students' *Ought-to L2 Self* (framed as externally sourced self-images) correlated positively with intended efforts for both English and Mandarin, but there was no direct link between the *Ought-to Self* and students' course grades. This stresses the *Ought-to L2 Self*'s limited motivational capacity and weaker links with the criterion measures than the *Ideal L2 Self*. Focusing on a group of undergraduate students from an international university in Thailand, Rattanaphumma (2016) found that students' *Ideal L2 Self* was influenced by personal, career, and financial aspirations as well as a desire to leverage the L2 to communicate in the globalized world. Rattanaphumma also explained that these students' *Ought-to L2 Self* was shaped by society, parents, and peers, including circulating perceptions in the local community that linked competency in English to visions of an "educated person." Thompson (2017) proposed the construct of an *Anti-Ought-to Self* and articulated how it connects to the original L2 Motivational Self System. The *Anti-Ought-to Self* is "motivated by the opposite of what the external pressures demand: choosing to study a language to go against the norms of society" (p. 39). This study, using narrative inquiry to examine language learning journeys, honed in on the synergies between learners' *Ought-to Self* (e.g., learning an L2 for the prospect of employment) and *Anti-Ought-to Self* (e.g., learning an L2 to prove a teacher wrong about "not being good at learning language").

Finally, the *L2 Learning Experience* concerns the situated and executive motives related to the immediate learning environment and especially prior experience interacting with the present learning environment. Although the least theorized component of the L2 Motivational Self System, the *L2 Learning Experience* is often the most powerful predictor of motivated behavior (Dörnyei, 2019). Drawing on the concept of student engagement from educational psychology, Dörnyei (2019) proposed a view of the *L2 Learning Experience* as the perceived quality of the learners' engagement with multiple elements of the language learning process. These elements include, for example, the school context, the syllabus and adopted teaching materials, the proposed learning tasks, as well as student-teacher and student-student relationships and dynamics. A burgeoning number of studies leveraged Dörnyei's L2 Motivational Self System to examine, for example, Korean L2 learners' writing strategy usage and writing quality (Jang & Lee, 2019) and Indonesian high school students' motivation to learn English as a foreign language (Lamb, 2009).

Connecting motivation and agency from a CDST perspective, Mercer (2011) attempted to provide an "initial contribution towards an ongoing



conversation about both the nature of learner agency and what complexity theory can offer researchers, and more challengingly in practical terms, educators in this field” (p. 435). In this discussion, the author argued for a view of language learner agency as a complex dynamic system composed of several components (i.e., subsystems). This approach rejects perspectives of learner’s agency as a single, monolithic factor, and tries to reconcile discrepant views that assign prominence to either the individual’s cognition or the social context in their explanation of this concept. According to Mercer (2011), a realist view of learner’s agency focuses on the complex dynamic interactions between social structure and agency, conceiving them in a reciprocal relationship. Such a view leads to the understanding of humans as creative agents that influence (and are influenced by) their contexts, and not determined by them. In her longitudinal study with a female tertiary-level EFL learner, Mercer (2011) concluded that “learner agency exists as a potential to engage in self-directed behavior but how and when it is used depends on the learner’s sense of agency involving belief systems, control parameters of motivation, affect, metacognitive / self-regulatory skills, as well as actual abilities and the affordances, actual and perceived, in specific settings” (p. 435). The author also pointed to the variability of the learner’s agency, a key aspect of complex systems, as it seems to be continually developing and adapting to changes in different parts of the system. Larsen-Freeman (2019) also proposed that the transdisciplinarity of CDST be leveraged to the investigation of second language learners’ agency, positioning the dynamic relationship between social structure and agency as an irreducible system that moves through time and space. The author foregrounds a view of agency as: relational, or engendered from the dynamic interaction of factors internal and external to the system; emergent; spatially and temporally situated; achieved by means of an environment; changing through iteration and co-adaptation; multidimensional; and hierarchical. This view, in turn, has implications for classroom practice and how to support learner agency. This includes teacher practices that are adaptable, support learners in optimizing conditions for their own learning, investigate language together, encourage learners to reflect meta-pragmatically on the relationship between language and identity, and implement learner-driven feedback.

### **Discussion**

In terms of the first research question guiding this critical literature and theoretical review, on the surface both SCT and CDST seem to share similarities in how they portray the complexity of L2 motivation. Each perspective tries to unify the individual and social and addresses the relationship between L2 learners’ motivation and the mediating effects of the sociocultural environment, the role of social processes that influence uniquely individual motivation, and propose future-oriented approaches. In both perspectives, L2 motivation is seen as situated, complex, dynamic, and changing over time, with many interrelated factors. In addition, as each L2 learner has their own unique trajectory, their motivation is not guaranteed and is variable in its outcome even though they may share similar contexts.



However, when examined further, several fundamental differences emerge not only in the context of L2 motivation research (e.g., that which propels and sustains motivation) but also in their overall guiding theoretical principles. In what follows, we turn to the specific dimensions that distinguish SCT and CDST that became apparent through our analysis, namely their philosophical foundations and units of analysis, as well as orientations to the role of history, culture, context, and individual agency.

### **Philosophical Foundations**

The first aspect that differentiates SCT from CDST is its philosophical foundation. These philosophical differences have major implications for the study and conceptualization of motivation, and in particular L2 motivation. Vygotsky's SCT perspective is grounded in Marx's historical materialism to investigate the cultural development of higher mental functions (see Cong-Lem, 2022; Poehner, 2017; Stetsenko & Arievitch, 2010). A dialectic is the relationship between objects, events, actions, and people—we are who we are in relation to other things and there is nothing that exists independently of its relations. From a dialectical perspective, there can only be complex systems because of relations, nested or not, and there exists no system independent of the environment. These complex systems themselves have goals and purposes. Vygotsky viewed development as a qualitative transformation of the individual and advocated for the examination of objects in their mutual connections. Therefore, L2 motivation can be considered to emerge from a dialectical interaction between L2 learners' agency and their sociocultural surroundings (Kim, 2005). Importantly, with the social situation of development in mind, individuals and their sociocultural surroundings exist in a dynamic and reciprocal relationship. That is, while the sociocultural environment contributes to the formation of the individual, the individual also contributes to the formation of the environment.

CDST, on the other hand, originates from the natural sciences. As such, it is important to critically consider whether the CDST is an appropriate theory to account for human mental behavior, motivation, and aspects of language development. These are questions raised by prominent CDST scholars themselves (see de Bot, Verspoor, & Lowie, 2005; Larsen-Freeman, 2011). Specifically, since CDST was developed to account for the non-organic world, which is notably far less complex than the biological world (Deacon, 2011), a new type of theory may be needed if complex organic systems are to be understood. Additionally, adopting a broad definition of system in CDST, Larsen-Freeman and Cameron (2008a) stated that "a system is produced by a set of components that interact in particular ways to produce some overall state or from a particular point in time" (p. 26). With its distinct methodological perspective, CDST is interested in interconnected self-organizing systems which are fueled by perturbations from the outside (Larsen-Freeman, 2011). CDST emphasizes the orderly but dynamic interconnection among nested complex systems contributed by the learner and the environment. In CDST, it is possible to look at a system unto itself (i.e., as separate variables such as the L2 Motivational Self System) and as such, it is possible to lose sight of the overall relations.

## Unit of Analysis

Although scholars have argued that CDST is a way to bridge the schism in the L2 motivation research (i.e., between downward and / or upward reductionism), it is our belief that contextual CDST is still a complex form of reductionism, which continues to dominate the natural sciences. Reductionism breaks up any dynamic whole by reducing it and looking at its parts, rather than dialectically seeing the interconnectedness and mutual influence of the parts or seeing the whole as much greater than the sum of its parts.

From a dialectical understanding, dialectics is opposed to reducing the object of study to its minimal elements (i.e., an atomistic analysis). To illustrate, Vygotsky puts forward an analogy with the chemical analysis of water into the elements of hydrogen and oxygen. Isolated, these elements have properties that are not found in the whole (i.e., water) and the whole has properties that are not present in its elements; for example, its capacity to extinguish fire. The whole is qualitatively distinct from its isolated elements and no object can be understood without taking account of its interactions with other objects so that the properties of the whole can still be maintained. In other words, “[e]verything has to be understood in relation to other things, so that these relations become the very being of that thing” (Marcuse, 1954, p. 68, as cited in Buss, 1979, p. 78).

From an SCT perspective, the whole is found in the parts, which is why Vygotsky, following Marx, searched for a unit of analysis rather than reducing the object of investigation to its elements. Initially, Vygotsky argued that consciousness is composed of the dialectic between thinking-and-speaking (i.e., verbal thinking) and tried to find a unit that included both as a reflection of consciousness (i.e., the word). Later, Vygotsky recognized the unity of emotion-and-verbal thinking which is captured in his theoretical use of *perezhivanie* (Lantolf & Swain, 2019). In SCT, Vygotsky (drawing upon Marx who drew upon Hegel), understood the importance of making abstractions and breaking down processes into manageable units for analysis. For SCT, there is no system independent of the environment. Importantly, Vygotsky recognized the need to put the parts back into the reconstituted whole. As cited in Ollman (2003) in reference to Marx and the process of abstraction:

In his most explicit statement on the subject, Marx claims that his method starts from the "real concrete" (the world as it presents itself to us) and proceeds through "abstraction" (the intellectual activity of breaking this whole down into the mental units with which we think about it) to the "thought concrete" (the reconstituted and now understood whole present in the mind) (Marx, 1904, 293-94).

In contrast, CDST seems to present a different orientation and approach to the relationship between interrelated parts and their sum. According to Larsen-Freeman and Cameron (2008a), CDST “aims to account for how the interacting parts of a complex system give rise to the system’s collective behavior and how such a system simultaneously interacts with its environment” (p. 1). A system, then, is a collection of interacting parts (i.e., variables) that influence each other, in what appears to be a cause-effect relationship, able to be studied in isolation, eventually giving rise to the system’s collective behavior. This logic is also found in Thelen

and Smith's (1994, 2006) CDST model of human thinking. An adequate philosophical framework and methodology for CDST still appears to be missing.

### **The Role of Studying History**

Broadly, Both SCT and CDST are interested in studying the process of change over time and attempt to trace trajectories that have resulted in current states of being. While on the surface, both retrodictive qualitative modeling (CDST) and studying history backwards (SCT) appear to be similar, they are methodologically distinct. These methodological differences are summarized by McCafferty (2016) as "SCT concentrating on the social genesis of consciousness and DST on how systems develop" (p. 84).

Applied to CDST, the goal of retrodiction is that by "identifying the main emerging system prototypes we can work 'backwards' and pinpoint the principal factors that have led to the specific settled states" (Dörnyei, 2014, p. 85) and trace why the system has the particular outcome that it does. This, then, provides a "retrospective qualitative model of its evolution" (Dörnyei, 2014, p. 85). Vygotsky, on the other hand, meant something different by his use of "history." From an SCT standpoint, "the task of psychology...is to understand how human social and mental activity is organized through culturally constructed artifacts" (Lantolf, 2000, p. 1). To capture the impact of culturally constructed mediating artifacts, consciousness must be studied "in flight" (Vygotsky, 1978, p. 68) and "to study something historically means to study it in the process of change" (Vygotsky, 1987, pp. 64-64). This indicates that consciousness must be studied in activity, and in the process of its genesis.

A very important difference between CDST and SCT is that SCT is not just a lens to examine development, but is also a theoretical perspective that aims at provoking development. In this regard, Vygotsky was not only interested in studying history backwards, but also in studying history forward. The process of studying history forward is captured in Vygotsky's use of the Zone of Proximal Development (ZPD) which is defined as a metaphorical space between what learners are able to do with mediation (i.e., what they can do today) and what they may be able to do without mediation (i.e., what they can do independently tomorrow) (Vygotsky, 2012).

### **The Role of Context and Culture**

In regards to L2 motivation research, Dörnyei, MacIntyre, and Henry (2015) have described the L2 Motivational Self System as a "dynamic 'motivation-cognition-emotion amalgam'" (p. 4). In this approach, motivation is approached as one's striving to or avoidance of possible selves in order to achieve their own inner-most potential (MacIntyre, Mackinnon, & Clément, 2009). Emotions are an important component of the learner's self-system, being deeply interconnected with motivation and action. Markus and Ruvolo (1989) viewed that the main advantage of framing future goals in terms of possible selves is that these representations seem to capture some aspects of what individuals experience when they are engaged in motivational behavior (i.e., their thoughts and feelings). On the other hand,

grounded in the general principles of AT, motivation becomes viewed as a socially mediated phenomenon (Ushioda, 2003) that integrates motive, goal, and participation. This implies that the genesis or emergence of L2 motivation is not from within the individual (as it seems to be within the L2 Motivational Self System approach), but rather from the broader society; that is, the dialectical interaction between an individual and their sociocultural surroundings. For SCT, agency is the result of interaction with the sociocultural surroundings from the beginnings of life.

When placed side-by-side, it seems that AT, and SCT in general, emphasizes how culture shapes and creates new motives and motivational processes. For Dörnyei's L2 Motivational Self System, the focus is on the motivational function of the gap between "present self-concept and knowledge" and the future "L2 ideal and ought-to selves." Although Dörnyei's dynamic approach brings the L2 learning environment as one component of the L2 motivational self-system, the construction of the learner's possible selves seems to receive little emphasis. Precisely, even though previous experiences in the learner's environment and their future possible selves are integral parts of the learner's motivational self system, sociocultural elements and their influence in the entire L2 motivational self system could be further explored. Therefore, it seems that motivation in Dörnyei's approach is mainly an "individual" construct, formed and maintained by one's own self-oriented images of oneself in the future, achieving a goal.

Furthermore, in Rosmawati's (2014) discussion on how CDST accounts for issues in L2 learning, the place occupied by the notion of motivation seems underprivileged when compared to the same concept in AT. Rosmawati (2014) saw motivation as one of the essential resources for language development along with, for example, input and memory. However, this author seems to argue that language learning is possible without motivation, since other resources available can make up for its absence: "When one type of resource is depleted — for example, lack of motivation — the system can hardly maintain its optimal state and may slide back to its previous state *unless compromised by other types of resources; for example, extensive exposure to the target language and the need to communicate*" (2014, p.70, emphasis added). This goes against compelling examples in the literature that show that one can have extensive exposure to a second language, and the need to communicate, and yet fail to develop (e.g., Schmidt, 1983). Additionally, it is important to highlight that the need to communicate may serve as a key type of motivation for language learners (Cameron, 2013; Freiermuth & Huang, 2018). Overall, this view put forth by CDST scholars differs, in regards to the role of motivation, from that advocated within AT specifically and SCT more broadly. For the latter, motivation propels human engagement in activity and is seen as a result of an individual's cultural development.

### **The Role of Agency**

Mercer (2011) argued that the CDST perspective adopts a more balanced perspective on agency, emerging as the "common ground" between two opposite views that assign primacy to either the individual's cognition or to the social contexts. However, while agency is an important topic within CDST, it is not more

important than other elements in the system (Kim, 2016). In this way, it appears that agency, similar to L2 motivation, may be viewed as the sum of interacting elements within the system and is the result of various system parameters and attractors. While scholars have addressed the issue of agency and intentionality from a CDST perspective and noted that “agency or intentionality are not ignored in these applications” (Larsen-Freeman, 2011, p. 58), “it remains to some extent an open question as to how far complexity theory can accommodate deliberate decision-making” (Larsen-Freeman & Cameron, 2008, p. 76). This is especially the case as CDST is applied to human motivation (see Al-Hoorie, 2015) and is a topic of ongoing discussion and debate.

Revisiting the principles of Vygotsky’s cultural-historical perspective compels us to reconsider Mercer’s argument. First, SCT and AT do not assign primacy to the social context in the formation of the mind. As Lantolf and Johnson (2007) put it, “the argument is not that social activity influences cognition, but that social activity is the process through which human cognition is formed” (p. 878). In this sense, there is no environment apart and it is a distributed system from the beginning. Furthermore, in AT, human conduct is seen as directed, yet mediated by mediational means, such as tools and signs (Leont’ev, 1978, Vygotsky, 1978). One cannot be separated from the other as they exist in a dialectical relationship. As Kim (2006) reminds us, L2 motivation is “a creative construction or dialectical interaction between L2 learners’ agency and their sociocultural surroundings” (p. 53).

### **Conclusion**

Both an SCT and CDST perspective to the L2 learning and development process have undoubtedly made great contributions to the field. Within the ongoing debate of the commensurability of SCT and CDST, scholars have pointed to a theoretical overlap between SCT and CDST, noting that “both try to unify the social and the cognitive, although they do so in different ways, and neither is exclusively a theory of SLA” (Larsen-Freeman & Cameron, 2008a, p. 157). In terms of L2 motivation, and pointing to the viability of each perspective in capturing the complexity of L2 motivation, Kim (2016) states that there “exists a considerable interface between CDS and SCT” (p. 45). Kim (2016) goes on to state that since both perspectives can help to capture and / or emphasize various aspects, that they “are not in opposing positions, but instead have their strengths in different areas and thus warrant complementary co-habitation” (p. 46). Another scholar suggests that “applying CDST can see L2 motivation from a much broader and flexible perspective” (Kimura, 2014, p. 326).

In light of the arguments proposed in this critical literature and theoretical review, our response to our second research question is that it does not seem that these theories are commensurable in general or in their view of L2 motivation. On one level, it seems that this incommensurability stems from their origins (CDST originating from the natural sciences) and their grounding on (or lack thereof) a philosophical foundation. Regarding the latter, a philosophical foundation still appears to be absent from CDST. These differing origins and orientations have implications for how motivation is conceptualized within each respective tradition.

While there appears to be shared elements between SCT and CDST (Karimi-Aghdam, 2016, 2019; McCafferty, 2016), more careful attention and further scrutiny is warranted, especially as fundamental differences may arise in interpreting data, as more L2 studies are designed and implemented, and as researchers-practitioners continue to work within the theory-practice divide. We hope to continue this discussion as both sides can learn a great deal from each other. It is our hope that this piece can generate productive dialogue between scholars, researchers, and teachers.

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## Note

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1 We adopt this term from Atkinson (2011) who positions these theories as "alternative" to the dominant cognitivist orientation in SLA.

2 These mediational means are described as physical (e.g., pencils, paper, computers) or psychological (e.g., language, concepts) tools and shape the framing of our mental activity, our interactions within our situated contexts, and enable us to gain control over our higher mental functions (Lantolf & Appel, 1994; Vygotsky, 1931).

3 A survey of the development of Activity Theory (AT) through its three phases is beyond the scope of this study. For an overview, see Engeström (1987, 1999, 2001).

4 For an overview of the diverse meanings of the concept of meaning and a historical treatment from varied fields, see D. A. Leontiev (2012b).

## Authors' Biographies

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