

A Psycho-Socio-Cultural Approach towards Technology-Assisted Language Teaching: Nonlinear Dynamic L2 Motivation Theory

Shiva Soltani (shivasoltani061@gmail.com)
Islamic Azad University, International Kish Branch, Iran

Ahmad Mohseni (amohseny1328@gmail.com)
Islamic Azad University, South Tehran Branch, Iran

Abstract

Overlooking the nonlinearity and dynamicity of the second language (L2) motivation and overlooking the emerging educational technologies available in computer-assisted language learning (CALL) environments that provide interactive access to the target L2 community are among the main limitations of the L2 Motivational Self-System (L2MSS) that justify the need to revisit it. The L2MSS narrows down a complex aspect of L2 learners to a limited list of *Self* types under a unidirectional theory without offering sufficient evidence on the contextualization of the basic components. Drawing on dynamic systems theory, this conceptual study introduces nonlinear dynamic L2 motivation theory (NDL2MT) as a comprehensive and multidimensional replacement. The NDL2MT integrates the emerging educational affordances present in CALL environments and converges the psycho-socio-cultural findings on L2 motivation into a multidimensional theory. The implications of the study for pedagogy, research, and assessment are discussed with regard to the nonlinearity and dynamicity of L2 motivation.

Keywords: L2 motivational self-system (L2MSS); nonlinear dynamic L2 motivation theory (NDL2MT); dynamic systems theory (DST); computer-assisted language learning (CALL); second language (L2)

Introduction

Despite relying on partially sound evidence as the solid basis of its contextualization, Dörnyei's (2009) L2 motivational self-system (L2MSS) has been adopted in second language (L2) motivation studies over the last decade. According to the L2MSS, L2 learners are motivated by three basic components: Ideal L2 Self (based on aspiration and goals), ought-to L2 Self (based on obligation and responsibilities), and L2 learning experience (based on learner's perception of the previous learning experience). These selves reflect the expected, hoped, and feared selves (which serve to energize our actions in future states) introduced by Markus and Ruvolo (1989). Despite the dynamic and nonlinear nature of L2 motivation (Bahari, 2019a, 2019b; Kaplan & Garner, 2017), these critical features have not been addressed in the L2MSS and several questions remain unanswered. For example, does this list of selves practically encompass all possible self-types of an L2 learner? Is this theory still applicable to the current

computer-assisted language learning pedagogy with frequent intercultural and interlinguistic contact between the learner and the target community? Is this theory (which fails to address the dynamicity and nonlinearity of L2 motivation by limiting its bases to three self-types) still applicable in the current era which is described by its theoretician (i.e., Dörnyei) and his co-authors as an era when “scholarly interest has focused on contextual and dynamic aspects of learner motivation” (in Boo et al., 2015, p.146)? To answer these questions, first, the need to revisit the L2MSS will be discussed by a quick review of the studies reporting the deficiencies and inconsistencies of the L2MSS. Then, nonlinear dynamic L2 motivation theory (NDL2MT) will be described which has been successfully contextualized based on the focus on form (FonF) practice model.

The Need to Revisit the L2MSS

Incompatibility with Contemporary Computer-assisted L2 Learning-Teaching Era

The L2 motivational self-system introduced by Dörnyei (2009) does not seem to fit into the computer-assisted language learning (CALL) context for several reasons as stated by different scholars (see Table 1). On the whole, the two most important drawbacks of the model in this regard are: first, the rise of CALL has bridged the gap of intercultural contact by providing immediate access to the target L2 community via a variety of tools and affordances (Bahari, 2019b), and second, real-time interaction of L2 learners with native speakers (i.e., target community) by a variety of online communicational platforms (e.g. WhatsApp, Twitter, Skype, Facebook, Viber, etc.) creates a real-time interactive communicative situation that varies from the traditional face-to-face context and requires a revised theoretical perspective in keeping with the developing CALL context for both research and pedagogy purposes.

Table 1

Overview of Studies Reporting the Deficiency of the L2MSS

Author(s)	Theoretical perspective	Methodology	Statement showing the failure of the L2MSS theory
Bahari (2019a)	Dynamic Systems Theory	Mixed methods approach	“L2MSS were not consistently correlated with learners’ achievement” (p. 56)
Subekti (2018)	Motivation-achievement relationship	Quantitative	“... could not be a strong predictor of their (i.e., learners’) achievement” (p. 17)
Moskovsky et al. (2016)	L2 Motivational Self-system	Qualitative & Quantitative	“L2MSS components were not consistently associated with achievement” (p. 6)
Lamb (2012)	L2 Motivational Self-system	Qualitative & Quantitative	“Ideal L2 Self in this study only marginally influenced participants’ achievement” (p. 13)

Sampson (2012)	L2 Motivational Self-system	Action research project	“Some activities appeared to provide very little motivation...in terms of the L2 Motivational Self-System” (p. 19)
Taylor, Busse, Gagova, Marsden, & Roosken (2013)	Educational psychology	Quantitative & Qualitative	“The model does not pay due attention to actual self” (p. 44)
Driver (2017)	Lacanian ideas of clinical psychoanalytic practice	Qualitative	“Any motivation discourse... is not as totalizing as it might seem” (p. 712)
Taylor (2010)	Relational analysis (between classmates and teachers)	Quantitative	“The correlations between the public selves and the private selves were very low” (p. 12)
Kormos & Csizér (2008)	L2 Motivational Self-system	Quantitative & Qualitative	“The model is still in its infancy and requires further elaboration and empirical testing” (p. 332)
Kaplan & Garner (2017)	Complex Dynamic System	Theoretical perspective	“Current prominent models of identity face challenges in bridging across divergent perspectives” (p. 1)

Incompatibility with Dynamicity and Nonlinearity of L2 Self Types

Sampson (2012) reported that “students were able to perceive a variety of ways in which their L2 self-image changed over the course of the enhancement program” (p. 333). Given the diversity of the nature of experienced self-images from one learner to another and the diversity of the type of self-image from one learner to another, the reported changing self-images can be used as evidence in support of the dynamicity and nonlinearity of the *Self* types in L2 learners.

Bahari (2019a) contends that learners are motivated by long-term future goals as well as short-term future goals which vary dynamically and nonlinearly from one learner to another (). Drawing on self-determination theory, some studies have approached self as a central concept and consider the L2 learner as the source of motivation under positive Self-belief (Mercer & Ryan, 2010; Mercer & Williams, 2014). This might look relevant if we consider the L2 learner as the sole decision maker who possesses the autonomy to proceed with L2 motivation regardless of the presence of a variety of internal-external and psycho-socio-cultural factors which are dynamically and nonlinearly at work to motivate or demotivate every individual learner.

In the same line of thought, the L2MSS introduces “ideal L2 self”, “ought-to L2 self”, and “L2 learning experience” as the sources of L2 motivation which inspire learners

to learn L2 by positive *Self* or negative-aspect-avoiding *Self*. However, there are several other instances of *Self* types (see Table 2) which show that L2 motivation genesis is not as limited as described by the L2MSS and L2 learners form L2 motivation by a dynamic and nonlinear range of *Self* types which are incompatible with the taxonomy of *Self* types introduced by the L2MSS.

Table 2

Instances of Dynamic and Nonlinear L2 Motivation Self Types Which Go beyond the L2MSS

Instances of dynamic and nonlinear L2 motivation <i>Self</i> types beyond the L2MSS	Compatibility with <i>Self</i> types proposed by the L2MSS			Description
	Ideal L2 <i>Self</i>	Ought-to L2 <i>Self</i>	L2 learning experience	
Aesthetic <i>Self</i>	Incompatible	Incompatible	Incompatible	When you find an aspect of L2 so interesting/appealing to your senses that you decide to learn it and cater to aesthetic interests.
Superior <i>Self</i>	Incompatible	Incompatible	Incompatible	When you want to obtain superiority over others in a group/community by knowing and using a particular L2
Religious <i>Self</i>	Incompatible	Incompatible	Incompatible	When you become interested in a particular religion then you decide to learn more about it in its language
Oppositional <i>Self</i>	Incompatible	Incompatible	Incompatible	When you and your abilities are belittled by a demotivating teacher, you might resort to oppositional behavior and use the negative feeling inside you as a motivation to prove him/her wrong
Multicultural <i>Self</i>	Incompatible	Incompatible	Incompatible	When you consciously and dynamically shift

				from one culture to another to cater to your dynamic cultural interests, you possess a unique self-process that serves you as the source of motivation
Family Self	Incompatible	Incompatible	Incompatible	Imagine you are the father of a family who values the family's identity. Your mother tongue is Arabic but your wife is Thai and does not know Arabic. Your children go to English school. To defend your family's identity your family self pushes (i.e., motivates) you to speak in English for the benefit of the whole family.
Narcissistic Self	Incompatible	Incompatible	Incompatible	When you keep learning a language (e.g., a dead language or a language that nobody knows around you) for the pursuit of gratification from egotistic admiration or vanity.
Gameholic Self	Incompatible	Incompatible	Incompatible	Imagine you are addicted to computer games in English and this type of self is the most important motivation for you to improve your knowledge of English to create a better understanding of the game.
Intellectual Self	Incompatible	Incompatible	Incompatible	When you feel the need to expand your wisdom by learning

	another language and understanding the psycho-socio-cultural world of the people who speak that language.
--	---

Aesthetic *Self*, as an instance of dynamicity and nonlinearity of L2 *Self*, is incompatible with three types of *Self*-proposed by the L2MSS. The aesthetic *Self* does not represent our ideal future *Self*, it does not represent our feared Selves nor our L2 learning experience. All of the above instances plus an infinite list of *Self* types show how dynamic and nonlinear is our L2 motivation *Self* types.

Religious *Self* motivates us to learn the language of a particular religion for a variety of reasons (e.g., motivating the lifestyle and demeanor of its followers). For example, if you become attracted by the Arabic recitation of the Quran, then you are likely to decide to learn more about its language. After some time, you might see Faravahar, which symbolizes Zoroastrianism and its basic beliefs, and decide to learn the dead language of Avestan. It is worth mentioning that our religious *Self* might become interested in religions other than the above two (i.e., Islam and Avesta), reflecting the dynamicity of our religious *self* and the order of being motivated by religious *Self* varies from person to person, and this can reflect its nonlinearity (Bahari, 2020a).

Oppositional *Self* can serve some learners as a motivational genesis to survive against the restraining, humiliating, discriminatory, and biased behaviors of some teachers (i.e., demotivating teachers) without quitting learning or resorting to uncivil, dissenting, and resistant behavior in the classroom (Bahari, 2020b; Brehm, 1996).

Multicultural *Self* is the same conceptualization put forward by Adler (1977) under multicultural person. Multicultural personhood is constructed by constant manipulation and retrieval of cross-cultural elements in a collectively sedimented multicultural ambivalence. Such a multicultural *Self* is formed by multiple, interactive, and dialogic discourse at individual and social levels.

Under dynamic systems theory, the above list of possible Selves that are incompatible with the limited list of *Self* types proposed by the L2MSS can continue. But the main implication is the need to recognize the dynamicity and nonlinearity of *Self* types as the sources of L2 motivation which dynamically and nonlinearly differ from one learner to another across the time/context (Bahari, 2020c).

Failing to address the Interlingual and Intralingual Dynamicity and Nonlinearity of L2 Motivation

L2 motivation varies from one learner to another at both interlingual and intralingual levels (Bahari, 2020b). The former refers to a state where one learner is first motivated to learn a particular L2 and then under the influence of individual-learner-specific motivational factors becomes motivated to start learning another L2. The latter refers to a state where one learner is first motivated by a particular aspect of a particular L2 (e.g., songs, literature, etc.) and then under the influence of individual-learner-specific motivational factors becomes motivated to start learning another/other aspects of the same L2. Under dynamic systems theory (DST), language and language learning

nonlinearly and dynamically vary from one language to another and from one learner to another. The same is true for motivational factors of a language and its learning which differ from one language to another and from one learner to another. L2 learners are motivated by a dynamic and nonlinear list of factors that are beyond the autonomy of the Self-concept to regulate the L2 learning behavior. For example, when you are learning Spanish as a second language (as a primary goal in your mind), watching a cooking video introducing Italian meals might change the order of L2 learning (an instance of nonlinearity) without your conscious understanding. You become interested in learning more about Italian cuisine, and after some time, feel more and more interested in Italian traditional meals. Then you may decide to start studying Italian traditional meals, not in a translated language but the Italian language. Or as a student of history, while watching a Quran recitation, you might become motivated to learn Arabic. These and many other examples show that our L2 motivation is sensitive to a variety of nonlinear and dynamic factors that internally and externally push us to learn an L2 at one time/context and shift to another one at another time/context.

Nonlinear Dynamic L2 Motivation System Theory

Theoretical Basis

The nonlinear dynamic L2 motivation system (NDL2MT) draws on dynamic systems theory (DST). The DST enables us to approach L2 motivation from a dynamic rather than stable, nonlinear rather than linear, and dialogic rather than monologic perspective. Under NDL2MT, the nonlinearity of L2 motivation not only refers to the sensitivity of an individual L2 learner's identity to unpredictable environmental changes but also to the changing order of motivational factors in the same individual L2 learner. Under NDL2MT, dynamicity of L2 motivation refers to the psycho-socio-cultural interactions of the individual L2 learner with psychological, social, and cultural factors which dynamically influence the individual L2 motivation and vary from one person to another in response to the depth, type, and frequency of the internal/external psycho-socio-cultural interactions. By the same token, language is seen as a dynamic and nonlinear phenomenon, which varies from one person to another based on the depth, type, and frequency of the internal/external psycho-socio-cultural interactions at the individual level.

The main aspect of the NDL2MT is its multidimensionality, under which the L2 motivation is not merely influenced/formed by psychological (Deci & Ryan, 1985), or social (Sade, 2003), or multicultural factors/interactions (Ushioda, 2006). To avoid the deficiencies of the previous theories of L2 motivation, the NDL2MT, aims at recruiting the reported strengths of the psycho-socio-cultural theories on L2 motivation in keeping with DST to propose a comprehensive L2 motivation system that is compatible with the contemporary CALL context. Taking a broader look at L2 motivation, the L2MSS converges a variety of related theories to provide a comprehensive L2 motivation theory that bridges the aforementioned gaps in current theories, in particular the L2MSS. The NDL2MT proposes a reformed approach to L2 motivation pedagogy, research, and assessment in an era where tools and affordances are available in the CALL context.

The next outstanding aspect of the NDL2MT is its reciprocal relationship with the developing CALL context. On the one hand, the NDL2MT requires addressing a dynamic and nonlinear range of motivational factors which differ from one learner to another (which is almost impossible for a single teacher to cater to on his/her own). On the other hand, the developing CALL context enjoys a variety of tools and affordances which makes it possible for a single teacher to cater to dynamic and nonlinear motivational factors at the individual level without having to superficially homogenize a diverse learner group.

Psycho-Socio-Cultural Aspects of the Nonlinear Dynamic L2 Motivation System Theory

In spite of the presence of a common consensus on the dynamicity of beliefs, as they appear to vary across time and context in response to psychological, social, and cultural factors (Amuzie & Winke, 2009; Bahari, 2021c; Ellis, 2008; Hosenfeld, 2003; Kalaja & Barcelos, 2003; Kern, 1995; Mercer & Ryan, 2010; Mori, 1999; Rifkin, 2000; Tanaka & Ellis, 2003; Wenden, 1999), the gap of an inclusive multidimensional L2 motivation theory has not been bridged. Given the intertwined relationship between basic psychological features, socio-cultural environments, and learner's motivation (Deci & Ryan, 2008), the NDL2MT aims at converging the best of psycho-socio-cultural theories on L2 motivation into an applicable system. A system that can dynamically and nonlinearly address the L2 learner's motivation in terms of pedagogy (i.e., methodology and curriculum design), theory, and assessment from the individual learner level to the group learner.

Psychological Aspect

Psychology-based research confirms that dissimilarity of *Self* varies nonlinearly (i.e., in space and time) and dynamically (i.e., in type and content) from one person to another (see Table 3). Studies show significant relationships between the dynamicity of identity and learning in the psychological literature (Barcelos, 2003; Kaplan & Flum, 2012; Mason, 2008; Matthews et al., 2014; Mercer, 2011; Taylor et al., 2013). The relationship is clearly described by Kim et al. (2018, p. 4) who reported that “as identity drives learning, an individual's psychological features cultivate identity”. Accordingly, some studies have reported strong relationships between motivation and self-regulation (as a psychological factor) during the use of affordances offered by CALL context (e.g., self-determined course materials and self-determined control over learning pace and path; Cho & Kim, 2013; de Barba et al., 2016).

Table 3

Psychological Literature on the Dynamicity and Nonlinearity of the Possible Self Types

Author	Theoretical basis	Statements confirming the dynamicity and nonlinearity of Self types
Barcelos (2003)	Complexity theory	“Belief systems are not linear or structured, but complex and embedded within sets of beliefs forming a multilayered web of relationships” (p.26)

Mason (2008)	Complexity theory	“Individual human beings (learners, educators and administrators), various associations of individuals (classes, schools, universities, educational associations) and human endeavor (such as educational research) are multi-dimensional, non-linear, interconnected, far from equilibrium and unpredictable” (p.34)
Mercer (2011)	Complexity theory	“The findings in this study provide further evidence for the multidimensional, complex nature of self-concept” (343)
Taylor et al., (2013)	Self-concept theory	“One’s real (or perceived) self and the self-images...are engaged in dynamic relationship” (p.38)
Markus & Nurius (1986)	Vision theory	The authors argue that “only positive, not (equally existent) negative or neutral possible Selves are suitable motivators for learning and change” (p.960)

Social Aspect

The dynamicity and nonlinearity of our Selves is nowhere better demonstrated than in constant changes of our private Self as a result of our social Self (see Table 4). Socially speaking, given the advent of computer-assisted social interactions, we are experiencing a far more dynamic and nonlinear range of Selves, which requires a holistic approach to encompass all possible Self types and their emergence and construction based on dynamic systems theory (DST). The social aspect of learning facilitates learning in a variety of ways. For example, it facilitates the use of cognitive and metacognitive activities via socially regulated learning which usually happens in small groups of learners (Hadwin & Oshige, 2011). The main contribution of the NDL2MT to the social aspect of learning is that it welcomes the dynamicity and nonlinearity of L2 motivation and moves away from static and linear pedagogy by incorporating dynamic pedagogy (e.g., dynamic scaffolding, dynamic practice models, dynamic motivational strategies, dynamic assessment, etc.).

Table 4

Social Literature on the Dynamicity and Nonlinearity of the Possible Self Types

Author	Theoretical basis	Statements confirming the dynamicity and nonlinearity of Self types
James (1890)	Social identity	“People have as many social selves as the audiences they encounter” (p.234)
Schlenker (2003)	Self-concept	“Act the part and it becomes incorporated into the self-concept” (p.51)
Côté (2009)	Self-concept	“Adolescents display differential public selves in their various relational contexts” (p.14)

Luhtanen & Crocker (1992)	Social identity	“An individual develops social identities (who I am as a group member) in addition to <i>personal identities</i> (who I am as an individual)” (p.23)
---------------------------	-----------------	--

Cultural Aspect

The learner’s identity and its formation are under the influence of multiple and dynamic approaches (Phinney & Devich-Navarro, 1997) (see Table 5). Accordingly, dynamic identity responses to altering socio-cultural styles are present in a social context which ultimately pushes identity towards a dynamic variety of Self types (van der Zee et al., 2016). Given the dynamicity of human cultural settings and the multidimensionality and nonlinearity of individual human beings (Kuhn, 2008), it is highly critical to address this integral aspect of individual differences in future L2 motivation studies in terms of pedagogy, theory, and assessment.

Table 5

Cultural Literature on the Dynamicity and Nonlinearity of the Possible Self Types

Author	Theoretical basis	Statements confirming the dynamicity and nonlinearity of Self types
MacIntyre et al. (2009)	Cultural psychology	“Cultural differences in people’s self-concepts may influence the motivational qualities of possible selves” (p.12)
Islam, Lamb, & Chambers (2013)	L2 motivational self-system	“Cultural psychology recognizes that relational motives for action can be just as powerful for certain individuals as personal motives” (p.240)
Gore, Cross, & Kanagawa (2009)	Cultural psychology	[M]any Westerners assume that personal motives are the most effective in directing behavior because they are also expressive of the individual, independent self. In contrast, members of Eastern cultures may perceive relational motives as more effective reasons for pursuing goals because they involve a collective interest in the outcome. (p. 77)
Ward, Ng Tseung-Wong, Szabol, Qumseya & Bhowon (2018)	Multicultural identity	“Our conceptualization of cultural identity styles clearly highlights the dynamic roles that hybridizing and alternating play in the identity negotiation process” (p.30)
Matsumoto (1999)	Self-determination theory	“Culturally bound cognitions related to the self are multi-faceted, activated one of the time and dormant at others” (p.303)
Kuldas & Bulut (2016)	Sociocultural theory	“Another main factor attributable to the switch in the self-construal is the dynamicity of culture” (p.7)

The overview of the psycho-socio-cultural aspects of *Self* as a critical component of L2 motivation uncovered a multidimensional consensus about the presence of dynamicity and nonlinearity at the individual level which requires further attention in future studies on L2 motivation. This need is highlighted from a talent perspective by Kim et al., (2018, p.3) when they maintain that:

“The unique talents of individual group members should be welcomed for their potential to contribute to the field” which shows the need to cater for individual differences with respect to dynamicity and nonlinearity which are psychologically, socially, and culturally at work to form motivation. (p. 3)

Implications

For Pedagogy

One pedagogical implication of the study is that further insistence on the use of the L2MSS for L2 motivation studies will divert our attention from the dynamicity and nonlinearity of L2 motivation, and as Taylor (2010) reports, it can encourage “students to feel the need to display an identity that is not necessarily theirs in their interaction” (p. 13). Such a required-uniform-identity is the main characteristic of a teacher-centered and test-oriented L2 teaching-learning which ignores the dynamicity and nonlinearity of motivation at the individual level at the cost of creating/imposing a uniform learner group (Bahari, 2021c).

Creating a democratic learning environment where individual differences (in terms of L2 motivation) are encouraged to be expressed rather than pushed away at the cost of creating a superficially uniformed learner group, is the next pedagogical implication of proposing the NDL2MT. Such an environment enables learners to identify their motivational resources and unlock their potential in a collaborative effort with their teachers to experience a motivational learning experience as shared and narrative practices (Driver, 2017) instead of experiencing irreflexive modernity (Ekman, 2015) embellished with win-win fantasies of success which render learners incapable of reflecting on their individually dynamic and nonlinear motives.

Pedagogically, the NDL2MT applies to a democratic learning environment where every voice is heard (despite the dynamicity and nonlinearity of voices) and responded to with an individual-learner-adaptive approach. An individual-learner-oriented approach that moves away from prescribing/imposing a static methodology, curriculum, and assessment towards a learner-friendly environment that is equipped with CALL tools and affordances, and in which motivational factors are identified and catered for at the individual level. In an attempt to contextualize the dynamicity of learner differences, Bahari (2019a) tested the effectiveness of the focus-on-form (FonF) practice model as a nonlinear-dynamic-motivation-oriented practice model to develop language skills. The results of the study confirmed the effectiveness of the FonF model at developing language skills (i.e., speaking and listening) in line with the dynamic systems theory.

For Theory

Given the ample evidence on the nonlinearity and dynamicity of the L2 motivation, it seems necessary to write a motivational nomenclature based on dynamic systems theory as well as the findings of the formerly-introduced L2 motivation theories to facilitate our understanding of L2 motivation. Theoretically, in contrast to the L2MSS which may not be appropriate for adolescents, NDL2MT advocates dynamicity and nonlinearity of L2 motivation for all age groups without limiting these critical features to childhood (Mercer, 2009). Instead of limiting the sources of L2 motivation to a complex system of social contexts and relations (Ushioda, 2009), NDL2MT considers the internal/external psychosocio-cultural interactions of the L2 learner's Self as the genesis of forming L2 motivation which dynamically and nonlinearly varies from one learner to another depending on a dynamic and nonlinear range of internal and external factors. The main point is to recognize the dynamicity and nonlinearity of L2 motivation (as one of several individual differences) regardless of the significance of the motivational sources (i.e., core/peripheral) or the process of forming motivation (e.g., self-determined, context-dependent, etc.).

The point is that none of the theories on L2 motivation has been able to encompass all aspects of its formation and application neither theoretically nor practically. Accordingly, the present study proposes the NDL2MT as a comprehensive and multidimensional theory that can potentially converge and incorporate the best findings of different L2 motivation theories so far.

For Assessment

The main implication of the study is the need to encourage the spirit of recognizing the dynamicity and nonlinearity of L2 motivation (Song & Keller, 2001) as well as the need to assess L2 learning concerning the dynamicity and nonlinearity of individual differences instead of imposing a teacher-centered and test-oriented assessment. To this end, L2 teachers need to take advantage of tools and affordances available in the CALL context to facilitate nonlinear and dynamic L2 assessment at the individual level. To this end, it is critical to move away from traditionally-established teacher-centered and test-oriented approaches intended to create uniformed and impassive learner groups toward individual-learner-oriented approaches intended to create dynamically and nonlinearly inspired (i.e., motivated) learner individuals.

Conclusion

Drawing on dynamic systems theory, the NDL2MT considers every factor influencing/molding L2 motivation both nonlinearly (i.e., varies in order(s) from one learner to another) and dynamically (i.e., varies in type(s) from one learner to another) at psychological, social, and cultural levels. The focus of the NDL2MT begins at the individual level and expands to bigger groups (peers, class, school, etc.). Therefore, motivational factors in any learning context (face-to-face, CALL, and hybrid) need to be individually identified, addressed, and catered for in the NDL2MT-oriented L2 pedagogy (in terms of research, methodology, and assessment). Such a pedagogy requires the teacher-centered and test-oriented approaches to be replaced by a learner-centered and individual-learner-oriented approach. Looking from a traditionally-established static

teaching approach perspective, it might look like an unmanageable and chaotic scene of clashing and contrasting motivational factors; however, it is the literal fact of dynamicity and nonlinearity of individual differences which needs to be individually identified, addressed, and catered for as a way of reconnecting with our true L2 motivation(s). Under the NDL2MT, individual L2 learner (as a dynamic sub-system) is not forced to hide their motivational factors to be part of a superficially homogeneous learner group. Instead, every sub-system is encouraged to express the unique motivational factor(s) and enable the teacher to identify their dynamic and nonlinear motivational factors across the time and context and provide the appropriate individual-learner-specific L2 motivational factors.

References

- Adler, P. (1977). Beyond cultural identity: Reflections on multiculturalism. In Brislin Richard (Ed.), *Culture learning*. East-West Center Press, 24–41.
- Amuzie, G. L., & Winke, P., (2009). Changes in language learning beliefs as a result of study abroad. *System*, 37(3), 366–379.
- Bahari, A. (2021a). Computer-assisted language proficiency assessment tools and strategies. *Open Learning: The Journal of Open, Distance and e-Learning*, 36(1), 61–87. doi.org/10.1080/02680513.2020.1726738
- Bahari, A. (2021b). Computer-assisted nonlinear dynamic approach for the L2 teaching in blended and distance learning. *Interactive Learning Environments*, 28(6), 1–15. doi.org/10.1080/10494820.2020.1805774
- Bahari, A. (2021c). Computer-mediated feedback for L2 learners: Challenges vs. affordances. *Journal of Computer Assisted Learning*, 37 (1), 24-38. doi.org/10.1111/jcal.12481
- Bahari, A. (2020a). Game-based collaborative vocabulary learning in blended and distance L2 learning. *The Journal of Open, Distance and e-Learning*, 35(3), 1–22. doi.org/10.1080/02680513.2020.1814229
- Bahari, A. (2020b). Use of nonlinear dynamic motivational strategies to manage L2 academic entitlement and psychological reactance management. *Journal of language and Education*, 6(1), 34–55. doi.org/10.17323/jle.2020.10099
- Bahari, A. (2020c). Mainstream theoretical trends and future directions of L2 motivation studies in classroom and CALL contexts. *Computer-Assisted Language Learning*, 21(1), 1–28. <http://callej.org/journal/21-1.html>
- Bahari, A. (2019a). FonF practice model from theory to practice: CALL via focus on form approach and nonlinear dynamic motivation to develop listening and speaking proficiency. *Computers & Education*, 130(3), 40–58. doi.org/10.1016/j.compedu.2018.11.009
- Bahari, A. (2019b). The impact of applying FonF practice model on developing L2 listening and speaking with a focus on intentional and incidental vocabulary acquisition in CALL context. *Revista de Lingüística y Lenguas Aplicadas*, 14, 45–57. doi.org/10.4995/rlyla.2019.10785
- Barcelos, A. M. F. (2003). Researching beliefs about SLA: a critical review. In: Kalaja, P., Barcelos, A.M.F. (Eds.), *Beliefs about SLA: New research approaches*. , Dordrecht: Kluwer Academic Publishers, 7–33.

- Boo, Z., Dörnyei, Z., & Ryan, S. (2015). L2 motivation research 2005–2014: Understanding a publication surge and a changing landscape. *System*, 55, 145–157. doi.org/10.1016/j.system.2015.10.006
- Brehm, J. W. (1966). *A theory of psychological reactance*. New York: Academic Press.
- Cho, M. H., & Kim, B. J. (2013). Students' self-regulation for interaction with others in online learning environments. *Internet and Higher Education*, 17(1), 69-75. doi:10.1016/j.iheduc.2012.11.001
- Côté, J. E. (2009). Identity formation and self-development in adolescence. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology: Individual bases of adolescent development* (3rd ed., Vol. 1, pp. 266–304). Hoboken, NJ: Wiley.
- Csizér, K., & Kormos, J. (2009). Modelling the role of inter-cultural contact in the motivation of learning English as a foreign language. *Applied Linguistics*, 30(2), 166-185. doi:10.1093/applin/amn025
- de Barba, P. G., Kennedy, G. E., & Ainley, M. D. (2016). The role of students' motivation and participation in predicting performance in a MOOC. *Journal of Computer Assisted Learning*, 32(3), 218-231. doi:10.1111/jcal.12130
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York, NY: Plenum.
- Deci, E. L., & Ryan, R. M. (2008). Facilitating optimal motivation and psychological well-being across life's domains. *Canadian Psychology*, 49(1), 14–34. <https://doi.org/10.1037/0708-5591.49.3.262>
- Dörnyei, Z. (2009). The L2 motivational self-system. In Z. Dörnyei, & E. Ushioda (Eds.), *Motivation, language identity and the L2 self* (pp. 9–42). Bristol: Multilingual Matters.
- Dörnyei, Z., & Csizér, K., (2002). Some dynamics of language attitudes and motivation: results of a longitudinal nationwide survey. *Applied Linguistics* 23, 421–462. doi.org/10.1093/applin/23.4.421
- Driver, M. (2017). Motivation and identity: A psychoanalytic perspective on the turn to identity in motivation research. *Human Relation*, 58(1), 111–135. doi.org/10.1177/0018726716669577
- Ekman, S. (2015). Win-win imageries in a soap bubble world: Personhood and norms in extreme work. *Organization* 22(4), 588–605. doi.org/10.1177/1350508415572510
- Ellis, R., (2008). Learner beliefs and language learning. *Asian EFL Journal* 10(4), 7–25.
- Gore, J., Cross, S., & Kanagawa, C., (2009). Acting in our interests: relational self-construal and goal motivation across cultures. *Motivation and Emotion*, 33(1), 75–87.
- Hadwin, A., & Oshige, M. (2011). Self-regulation, co-regulation, and socially shared regulation: exploring perspectives of social in self-regulated learning theory. *Teachers College Record*, 113(2), 240-264.
- Hosenfeld, C., (2003). Evidence of emergent beliefs of a second language learner: a diary study. In: Kalaja, & P., Barcelos, A.M.F. (Eds.), *Beliefs about SLA: New research approaches*. Kluwer Academic Publishers, Dordrecht, pp. 37–54.
- Islam, M., Lamb, M., & Chambers, G. (2013). The L2 Motivational Self-system and National Interest: A Pakistani perspective. *System*, 41, 231–244. doi.org/10.1016/j.system.2013.01.025
- James, W. J. (1890). *Principles of psychology*. New York: Holt.
- Kalaja, P., & Barcelos, A.M.F. (Eds.), (2003). *Beliefs about SLA: New Research Approaches*. Kluwer Academic Publishers, Dordrecht.

- Kaplan, A., & Flum, H. (2012). Identity formation in educational settings: A critical focus for education in the 21st century. *Contemporary Educational Psychology, 37*, 171–175. doi:10.1016/j.cedpsych.2012.01.005
- Kaplan, A., & Garner, J. K. (2017). A complex dynamic systems perspective on identity and its development: The dynamic systems model of role identity. *Developmental Psychology, 53*, 2036–2051. doi:10.1037/dev0000339
- Kern, R. G., (1995). Students' and teachers' beliefs about language learning. *Foreign Language Annals 28*(1), 71–91. <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1944-9720.1995.tb00770.x>
- King, R. B. (2016). Gender differences in motivation, engagement and achievement are related to students' perceptions of peer-but not of parent or teacher-attitudes toward school. *Learning and Individual Differences, 52*, 60–71. doi.org/10.1016/j.lindif.2016.10.006
- Kim, A.Y., Sinatra, G.M., & Seyranian, V. (2018). Developing a stem identity among young women: a social identity perspective. *Review of Educational Research, 88*(4), 589–625. doi: 10.3102/0034654318779957
- Kormos, J., & Csizér, K. (2008). Age-related differences in the motivation of learning English as a foreign language: Attitudes, selves, and motivated learning behavior. *Language Learning, 58*(2), 327–355. doi:10.1111/j.1467-9922.2008.00443.x
- Kormos, J., Kiddle, T., Csize'r, K. (2011). Systems of goals, attitudes, and self-related beliefs in second-language-learning motivation. *Applied Linguistics, 32*(5), 495–516.
- Kuhn, L. (2008). Complexity and education research: A critical reflection. *Educational Philosophy and Theory, 40*(1), 177–189. <https://doi.org/10.1111/j.1469-5812.2007.00398.x>
- Kuldass, S., & Bulut, S. (2016). What is called self in educational research and practice?, *Basic and Applied Social Psychology, 38*(4), 200–211, doi:10.1080/01973533.2016.1198260
- Lamb, M. (2004). Integrative motivation in a globalizing world. *System, 32*(1), 3–19. doi.org/10.1016/j.system.2003.04.002
- Lamb, M. (2012). A self-system perspective of young adolescents' motivation to learn English in urban and rural setting. *Language Learning, 62*(4), 997–1023. doi.org/10.1111/j.1467-9922.2012.00719.x
- Liu, Y., & Thompson, A.S. (2018). Language learning motivation in China: An exploration of the L2MSS and psychological reactance. *System 72*, 37–48. doi.org/10.1016/j.system.2017.09.025
- Luhtanen, R., & Crocker, J. (1992). A collective self-esteem scale: Self-evaluation of one's social identity. *Personality and Social Psychology Bulletin, 18*(3), 302–318. doi:10.1177/0146167292183006
- MacIntyre, P.D., Mackinnon, S.P., & Clement, R. (2009). The Baby, the bathwater, and the future of language learning motivation research. In: Dörnyei, Z., Ushioda, E. (Eds.), *Motivation, language identity and the L2 self*. Multilingual Matters, Bristol, 43–65.
- Markus, H., & Nurius, P. (1986). Possible selves. *American Psychologist, 41*(9), 954–969.
- Markus, H., & Ruvolo, A. (1989). Possible selves: Personalized representations of goals. In L. A. Pervin (Ed.), *Goal concepts in personality and social psychology* (pp. 211–241). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

- Mason, M. (2008). What is complexity theory and what are its implications for educational change? *Educational Philosophy and Theory*, 40(1), 32–45. doi: 10.1111/j.1469-5812.2007.00412.x
- Matsumoto, D. (1999). Culture and self: An empirical assessment of Markus and Kitayama's theory of independent and interdependent self-construals. *Asian Journal of Social Psychology*, 2(3), 289–310. doi:10.1111/1467-839X.00042
- Matthews, J. S., Banerjee, M., & Lauermann, F. (2014). Academic identity formation and motivation among ethnic minority adolescents: The role of the "Self" between internal and external perceptions of identity. *Child Development*, 85(6), 2355–2373. doi:10.1111/cdev.12318
- Mercer, S. (2009). The dynamic nature of a tertiary learner's foreign language self-concepts. In M. Pawlak (Ed), *New perspectives on individual differences in language learning and teaching*, 205–220. Poznań–Kalisz: Adam Mickiewicz University Press.
- Mercer, S., & Ryan, S. (2010). A mindset for EFL: Learners' beliefs about the role of natural talent. *English Language Teaching Journal*, 64(4), 436–444. doi:10.1093/elt/ccp083
- Mercer, S. (2011). *Towards an understanding of language learner self-concept*. Dordrecht: Springer.
- Mercer, S., & Williams, M. (Eds.). (2014). *Multiple perspectives on the self in SLA*. Bristol: Multilingual Matters.
- Mori, Y., (1999). Epistemological beliefs and language learning beliefs: what do language learners believe about their learning? *Language Learning*, 49(3), 377–415. https://onlinelibrary.wiley.com/doi/abs/10.1111/0023-8333.00094?casa_token=OJQRiJHXHJoAAAAA:Ue1gq-Obd_3d4VdcKgde5NZpNEimqPTRQzML3ZFP5riyghChoWeSAhBwv2l0A1U0W0vZBsgcy_Kfbk
- Moskovsky, C., Racheva, S., Assulaimani, T., & Harkins, J. (2016). The L2 motivational self-system and L2 achievement: A study of Saudi EFL learners. *The Modern Language Journal*, 100(3), 1–14. doi.org/10.1111/modl.12340
- Phinney, J. S., Berry, J. W., Vedder, P., & Liebkind, K. (2006). The acculturation experience: Attitudes, identities and behaviors of immigrant youth. In J. W. Berry, J. S. Phinney, D. L. Sam, & P. Vedder (Eds.), *Immigrant youth in cultural transition: Acculturation, identity and adaptation across national contexts* (pp. 71–116). Mahwah, NJ: Lawrence Erlbaum.
- Rifkin, B., (2000). Revisiting beliefs about foreign language learning. *Foreign Language Annals* 33(4), 394–420. https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1944-9720.2000.tb00621.x?casa_token=7tWquZfuRy0AAAAA:Qk6fUTRaQk-ipFsM-vIf22IP4uS0Jzxm179O6-6kdPcnXsL86iUIScoEWsPEV7FSdLaEtAU4lO51B10
- Ryan, S. (2009). Self and identity in L2 motivation in Japan: The Ideal L2 Self and Japanese learners of English. In Z. Dörnyei & E. Ushioda (Eds.), *Motivation, language identity and the L2 self* (pp. 120–143). Bristol, UK: Multilingual Matters.
- Sade, L.A. (2003) *Querer e poder, querer e poder, querer sem poder: A motivação para o aprendizado de inglês na escola pública sob uma perspectiva semiótica social*. MA dissertation, Universidade Federal de Minas Gerais.
- Sampson, R. (2012). The language-learning self, self-enhancement activities, and self-perceptual change. *Language Teaching Research*, 16(3) 317–335. doi: 10.1177/1362168812436898

- Schlenker, B. R. (2003). Self-presentation. In M. R. Leary & J. P. Tangney (Eds.), *Handbook of self and identity* (pp. 492-518). New York: Guilford Press.
- Song, S. H., & Keller, J. M. (2001). Effectiveness of motivationally adaptive computer-assisted instruction on the dynamic aspects of motivation. *Educational Technology Research and Development*, 49(2), 5–22. doi:10.1007/BF02504925
- Subekti, A. S. (2018). L2 Motivational Self-system and L2 Achievement: A Study of Indonesian EAP Learners. *Indonesian Journal of Applied Linguistics*, 8(1), 57–67. doi:10.17509/ijal.v8i1.11465
- Tanaka, K., & Ellis, R., (2003). Study-abroad, language proficiency, and learner beliefs about language learning. *JALT Journal*, 25(1), 63–85. <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.537.7087&rep=rep1&type=pdf>
- Taylor, F. (2010). *A quadripolar model of identity in adolescent foreign language learners* (Unpublished PhD thesis). University of Nottingham.
- Taylor F, Busse V, Gagova L, Marsden E, & Roosken B (2013). *Identity in Foreign Language Learning and Teaching: Why Listening to Our Students' and Teachers' Voices Really Matters*. London: British Council.
- Thompson, A. S., (2017). Don't tell me what to do! The anti-ought-to self and language learning motivation, *System*, 5, 1-12. doi.org/10.1016/j.system.2017.04.004
- Ushioda, E. (2006) Language motivation in a reconfigured Europe: Access, identity, autonomy. *Journal of Multilingual and Multicultural Development* 27(2), 148–161.
- Ushioda, E. (2009). A person-in-context relational view of emergent motivation, self and identity. In Z. Dörnyei & E. Ushioda (Eds.), *Motivation, language identity and the L2 self*, , 215–228. Bristol: Multilingual Matters.
- van der Zee, K., Benet-Martinez, V., & van Oudenhoven, J. P. (2016). Personality and acculturation. In D. L. Sam & J. W. Berry (Eds.), *The Cambridge handbook of acculturation psychology* (2nd ed., pp. 50–70). Cambridge, UK: Cambridge University Press.
- Ward, C., Ng Tseung-Wong, C., Szabol, A., Qumseya, T., & Bhowon, U. (2018). Hybrid and alternating identity styles as strategies for managing multicultural identities. *Journal of Cross-Cultural Psychology*, 1–38. doi:10.1177/0022022118782641
- Wenden, A.L. (1999). Commentary. An introduction to metacognitive knowledge and beliefs in language learning: Beyond the basics. *System*, 27-4, 435-441. doi.org/10.1016/S0346-251X(99)00043-3
- Williams, M., Burden, R., & Lanvers, U. (2002). French is the language of love and stuff: Student perceptions of issues related to motivation in learning a foreign language. *British Educational Research Journal* 28, 503–528. doi.org/10.1080/0141192022000005805