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Emerging second language writing identity and complex dynamic writing

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ABSTRACT

Complex Dynamic Systems theory (CDS) has been widely used in the field of second-language acquisition (SLA). While adopting CDS to investigate second language writing (L2W) research, second language writing identity (L2WID) is little address in CDS. This study emerges the notions of CDS and L2WID, and reconceptualizes as an inclusive framework for future studies. The notion of L2 Complex dynamic writing is refined and it consists of writers' heterogeneities, acts of agency, and attractors among systems. The studies of L2WID are reviewed and categorized in sociopsychological, sociocultural, and sociolinguistic perspectives. Emerging the features of L2 complex dynamic writing and L2WID provides a framework to fill in the gap between L2 writing performance and writers' identities. This study contributes to three aspects. This study tailors the connection of L2 writing process and L2WID and offers an inclusive framework for those who are situated in L2 writing formal (classroom) or informal (social media) discourses to examine the power relations among L2 writing texts, selves, and relationships in their writing discourses. Ultimately, this framework fundamentally theorizes the nonlinear features of L2 complex dynamic writing with consideration of L2WID.

1. Introduction

Second language writing (L2W) studies have gradually increased in the United States since World War II, due to the increased number of international students and multicultural citizens in the country. Immigration also inspires scholars pay to attention to the relationships between language learning and learners' identities (Matsuda 2005; Norton 2013). However, research has not conceptualized the impact of identity on L2W studies because it has aligned writing studies with second-language acquisition (SLA), which emphasize psycholinguistic perspectives. In this vein, complex dynamic systems (CDS) theory has become one of the most widely used theoretical frameworks of SLA to explore various L2W

topics. However, CDS has not been used to discuss second language writing identity (L2WID), a gap this paper addresses.

Larsen-Freeman and Cameron (2008) developed CDS theory to fill in the gap left by different SLA learning theories, drawing on biological, ecological, and psychological perspectives. They conceptualize CDS theory as emergentist, connectionist, and functionalist to describe rather than predict L2 learners' performance and competence. Dörnyei, Henry, and MacIntyre (2015), who apply the theory in their work, describe it as providing alternative methods for research, including mixed methods. Henry (2015) and Mercer (2015) describe CDS theory as a way to explore the relationships between L2 writers' identities and writing performances. CDS theory provides a boarder framework for scholars to investigate L2 learners' implicit and explicit knowledge in a given time scale. (Larsen-Freeman and Cameron 2008; Mitchell, Myles, and Marsden 2013).

CDS theory describes the dynamic complexity of language learning systems; researchers have not used it to address learners' subjectivities. This means that individuals' relational interactions in language learning trajectories have not been mapped out; particularly the way in which identity relates to L2 writers' discursive and non-discursive expressions (Matsuda 2015; Norton 2013). Researchers cannot fundamentally ground L2 writing process without addressing subjectivities. Moreover, CDS highlights the butterfly effect, drawing on two irrelevant events that can have significant aftereffects. In the current paper, I argue that L2 writers' subjectivities and past experiences play a previously unrecognized role in L2W processes under CDS theoretical framework.

Scholars who CDS theory have not addressed the components of L2WID. Larsen-Freeman (2012), Larsen-Freeman (2015)) describes the features of CDS theory, but reduces the power of human agency in ecologies. I argue that L2 writing relates to writers' linguistic competence, environmental changes, past experiences, and social statuses, and these factors influence agency on the part of L2 writers (Ivanic 1998; Matsuda 2015; Norton 2013). As Henry (2015) suggests, CDS theory fails to address the dynamic dimensions of the L2 self in terms of learning to write. Therefore, in terms of L2 writing pedagogy, I argue that power, prior experiences, and environmental demands influence L2 writers' identities.

This study theorizes L2 complex dynamic writing through the lens of CDS theory (Larsen-Freeman 2012). I argue that CDS theory is relevant to L2WID and therefore to L2 writing pedagogy. The following sections review the literature regarding L2 writing studies and L2WID, then discuss how these two perspectives should be merged and applied to future studies.

2. Features of L2 complex dynamic writing

Larsen-Freeman and Cameron (2008) first applied CDS theory to language learning to illustrate the unpredictable and irreproducible features of an individual's language learning trajectory. In spite of this instability, L2 writing

occurs within writers' learning systems and consistently maintains equilibrium among different systems because, as CDS theory explains, language learners have the ability to adapt to environmental changes and implement appropriate actions to balance shifting learning experiences.

CDS theory emerges perspectives of L2 education and SLA to examine L2 writers' internal and external learning. The L2 educators have disagreed with SLA researchers, who focus on innate linguistic mechanism; by contrast L2 education researchers focus on creating environments, designing curriculum, and developing instruction to enhance explicit knowledge in L2 (Ringbom 1980). To comprehensively understand L2 writing process, perspectives of SLA and L2 education are both integrated and transcend the boundary of implicit and explicit L2 knowledge inquiry, providing a broader scope to examine L2 writing process and its complexities in multiple systems. CDS theory provides a transdisciplinary framework to deepen the understanding of L2 writing theory. The features of L2 complex dynamic writing are based on CDS theory as follows:

2.1. *Heterogeneity*

L2 writing reflects the heterogeneity of L2 writers' social lives and language use (Larsen-Freeman and Cameron 2008). Identifying the heterogeneous dimension of L2 writing is challenging, since many researchers have not always recognized the heterogeneity involved in L2 writing; these studies of writing have generally focused on particular aspects of learning to write.

Table 1 can be sorted into two categories: internal mechanisms and external environmental influences. Traditionally, researchers of SLA tended to explore internal mechanisms, such as motivation and learning aptitude, whereas researchers of L2 education focused on external settings, including learners' learning environments, language communities, ecologies, and economic statuses.

L2 complex dynamic writing is conceptualized as a process of multiple dimensions dynamically operate as L2 learners learn to write a L2. To be successful, L2 writers need to integrate both external environments and internal mechanisms, which CDS theory terms coadaption. Larsen-Freeman and Cameron (2008) argue that "co-adaptation is an interactive process, with each individual adjusting to the other over and over again" (p. 126). This includes changes in human cognition, progress toward L2 proficiency, the adaptation of environments, and connections within social contexts, which are all interconnected. To coadapt these differences requires a longer timescale; it is impossible for L2 writers to engage in learning environments, participate in communities, make progress in L2 writing, and engage in the given contexts all at once. Since these changes relate to writers' identities, coadaption is a lifetime practice. As such, Larsen-Freeman and Cameron (2008) argue that "co-adaption is developmentally constructed, not programmed or performed. It comes into being through interactions between the organism and its surroundings as well as interactions within the organism" (p. 127).

Table 1. Heterogeneity of L2 writers' social lives and language use, adapted from Larsen-Freeman.

Field (External)	Economic (External)	Finance (External)	Ecology (External)	Spoken interaction (External)	Classroom language learning (External)	Psychology (Internal)
Heterogeneity	Tastes, incomes	Risk, preferences, information	Eating, nesting, breeding, habits	Language learning background, style, discourse topics	Ability, personalities, learning demands	Motivation, prior knowledge, learning strategies
i.e. Students located in different universities, having different resources and campus climates.	i.e. Students have different economics statuses that will influence how they value their L2 learning processes.	i.e. Students select different institutes due to their financial situations.	i.e. Ecology affects students' writing processes. Some people are productive in the morning.	i.e. Facial expressions and gestures affect communication.	i.e. Interactions with instructors and peers affect students' knowledge construction.	i.e. Past experiences decide how students adapt new knowledge and learning motivations.

L2 writing differences are the result of interactions between external environ-ments and internal mechanisms. Despite the fact that SLA researchers are prone to investigate internal mechanisms and L2 education scholars tend to focus on external environments, CDS theory regard all differences as constituting the heterogeneity of L2 writers' social lives and language use. The next section will introduce the notion of agency to explain how L2 writers make decisions while writing.

2.2. *Agency*

The heterogeneity of L2 writing processes reflects complex relationships among writers' internal mechanisms and various external environmental factors. These differences result in writers' acts of agency. Agency is individuals' ability to make choices independently. For example, students behave differently as they learn to write in an L2 because their acts of agency are most likely to reflect past experiences and prior patterns of activities. Larsen-Freeman and Cameron (2008) argue that "humans make choices in the moment to employ the semiotic resources, including linguistic ones, they have [used] to realize their transac-tional, interpersonal, and self-expression goals," but note that "human agencies are being transformed beyond the consciousness of their speakers" (p. 8). That is to say, in L2 writing development, a writer makes preferable and/or possible choices because of interactions between established internal mechanisms and external environmental factors.

CDS argues that agency is associated with "change" and a set of "attractors." As such, the decisions people make are related to L2 writing processes. CDS describes two types of change: changes in "the state of the system" and "phase shifts or bifurcations." Changes in the state of the system reflect the dynamic actions of multiple behaviors at a particular point in time. For example, every L2 writing class can be considered a performance of an activity, and L2 writing curricula can be viewed as a system in which these performances exist. The L2 writing student participates in classroom activities, such as reading aloud, giving presentations, practicing grammar exercises, and engaging in group discussions. In this microsys-tem, these activities interact dynamically – engaging human acts of agency, as well as influencing external elements. Changes constantly occur in systems, and learners expect them. When a class repeatedly experiences these abovementioned four activities, L2 learners comes to expect these activities in L2 writing classes, even if the activities themselves change. This can be considered "the state of the system."

The major difference between "the state of the system" and "phase shifts" (or bifurcations) is the degree of the change to the system. "The state of the system" indicates a synthesis of changes that come from heterogeneous sources; in turn, "phase shifts" create radical changes in a snapshot or sudden change to a new mode (Larsen-Freeman and Cameron 2008). A dramatic change in an individual's primary activity may result from interactions with other systems and can influence

other systems as well. For example, phase shifts such as attending a new school, entering new classrooms, having new instructors, occupying a new seat, having new classmates, using new textbooks, entering a new community, following a new schedule, and encountering new curricula all affect the transfer student. The student has to adapt to sudden changes and become accustomed to engaging in the new environment.

Human agency influences L2 writers' decisions. When faced with different types of changes, CDS scholars argue that individuals either exercise agency according to their past experiences or preferred actions in relation to interactions among external environmental factors and internal mechanisms (Hiver 2015; Larsen-Freeman and Cameron 2008; Piniel and Csizer 2015). As described above, agency play a significant role in deciding whether a learner's learning activities are preferred or possible.

2.3. *Attractors*

Attractors[1] reflect a set of properties that emerge and are situated within a given context. Lucas (2006) argues that attractors can be applied to the human mind, and systems of attractors eventually stabilize in a periodic or chaotic trajectory. According to connectivism, Lucas (2006) argues that learning is a networking process that learners prioritize. As a result, learners build up learning paths based on past experiences rather than innate ability. Attractors serve as current information for learners to sort out, to help select their learning resources in the given contexts. When unpredictable events occur in an L2 writing process, L2 writers have the ability to adapt in order to maintain stability and move toward balance. Adaption is an innate human ability that enables people to understand their writing processes.

Hiver (2015) describes an attractor as "a pocket of stability." Attractors can vary within given recurring contexts. A butterfly flying around in a garden is a stable hunting pattern; however, changes to the butterfly's flapping wings could affect the weather system, which is unpredictably sensitive. In keeping with this metaphor, agency generally operates along a preferred path in an L2 writing learning process, but unpredictable attractors may cause changes.

Three types of attractors affect individual L2 writing process: fixed point, cyclic (or closed loop), and chaotic (or strange). First, a fixed point attractor is the most predictable change in daily life. Since it is stable, people who encounter this attractor are most likely to exercise agency in preferred ways based on their past experiences. For example, a student expects to use a dictionary while composing a L2 essay for unknown vocabularies. Bring a dictionary can help the L2 writer stably composing an essay although checking dictionary could be a random behavior in L2 writing process. If students do this repeatedly, they can accommodate changes in a new L2 complex dynamic writing process where new vocabulary is randomly introduced in new situations.

A cyclic attractor occurs within a longer timescale, such as a month, semester, or year, which leaves it less stable than a fixed point attractor. Writing a thesis typically involves cyclic attractors such as reading L2 literature, making appointments with committee members, working a professional editor, and irrelevant events that interrupt the process. Some relationships become cyclic attractors that recur during this process, and they may interact stably or unstably. Therefore, within this closed loop, L2 writers exercise agency in preferred or possible ways to adapt to changes until they achieve their periodical goals or recognize that they cannot.

A chaotic, or strange, attractor is unpredictable but not random. It may have significant effects that seem irrelevant to its ultimate consequences. Chaotic attractors are generally significant interferences that result in a major consequence with appropriate conditions. For instance, fossilization occurs unpredictably in any stages of L2 writing. However, chaotic attractors exist and function with appropriate conditions. A chaotic attractor challenges human agency's ability to deal with such irrelevant, unpredictable, non-negotiable changes in daily life.

Larsen-Freeman and Cameron (2008) claim that humans have an innate ability to coadapt to the complexity of multiple systems and to self-organize attractors in systems to maintain stability. Various types of attractors influence the L2 complex dynamic writing process, but human agency and identity also determine it. The next section discusses identity theory to strengthen the relevance of L2WID and L2 complex dynamic writing.

3. Emergence of L2 writing identity and L2 complex dynamic writing

This study aims to emerge L2 complex dynamic writing and L2WID. As Kramsch (2013) notes, SLA scholars started to pay attention to the topics of language and identity since 1950 for three reasons. First, increased global mobility after World War II spurred scholars to investigate multilingual citizens' identities and language learning. Second, Vygotskian theorists challenged classical psychological perspectives and opened discussions of the social and cultural identity of language learners. Last, language use is extended to multiple forms, including social media and technology. Scholars have therefore been rethinking the relationship between agency and language. Multiple areas of study have developed within L2 writing studies; particularly, CDS merges multiple disciplines, which it applies to L2 writing. However, a lack of discussion in L2WID underestimates L2WID's influences in L2 writing processes.

3.1. *Second language writing identity*

Since few studies of L2WID exist, focusing on L2 complex dynamic writing requires an independent discussion of the role of L2WID. Scholars who have undertaken discussions relevant to L2 writing and identity include Ivanic (1998)

and Matsuda (2015), who focus their scholarship on L2WID. Norton (2013) provides a poststructuralist framework to examine language learning and identity. However, the abovementioned perspectives on identity ambiguously address on its application on the L2 complex dynamic writing. Larsen-Freeman and Carson (2008) point out that

> [h]umans make choices in the moment to employ the semiotic resources, including linguistic ones, they have had to realize their transactional, interpersonal, and self-expression goals"; however, "human agencies are being transformed beyond the consciousness of their speakers. (p. 8)

They do not deny the impact of identity but their work does not explain the influence of interrelation among L2 writing actions, L2 writing performances, and L2 writing discourses. L2 writing is not limited to academic writing; various genres have been researched, if minimally (Matsuda 2015). Hence, the connection between complex dynamic writing and L2WID is in need of exploration.

Mitchell, Myles, and Marsden (2013) categorize SLA in social-psychological, social-cultural and sociolinguistics perspectives. My discussion of L2WID in three dimensions aligns with their categories, emerging the features of L2 complex dynamic writing. Matsuda (2015) argued that "identity did not receive much attention partly because the application go written discourse analysis focused primarily on academic writing instruction in a limited range of classroom genres, and the pragmatic goal of helping writers conform to the native-speaker norm was widely accepted" (p. 140). Using the native-speaker norm as framework to explore L2 writing is problematic. Thus, reviewing L2WID in these dimensions does not only align with SLA theories, but also avoids over-generalization in the native-speaker norm. L2WID can be investigated in social psychological, social cultural, and social linguistics for three reasons:

(1) L2W is regarded as a dynamic process. Self presentations are unlikely to be fixed since identity is psychologically developed and socially constructed (Gee 2011; Holland and Lachicotte 2007; Markus and Nurius 1986). The topics of motivation and learning aptitude are the most commonly researched regarding L2WID in social psychological perspectives. Dörnyei (1998) initially investigates L2 learners' motivations in a complex dynamic perspective and develops the notion of L2 motivational self with Csizer to trace how L2 writers present the ideal L2 self to respond to the dynamic complexities in writing discourse (Csizer and Dornyei 2005).

(2) L2 writing is an ongoing social practice. In addition to language community members and writing resources, sociocultural effects are formally/informally engaged in L2 writing practice in different formats, including in-person or digital interactions (Kostouli 2009; Norton 2013). Interactions among L2 writers and environmental demands have to do with L2 writers' positions

in gender, race, and class. They relate to how individuals construct their identities and proceed with the meaning-making process.

(3) L2 writing is a text-oriented activity. It also relates to individuals' translations and mediation between thoughts and texts (Vygotsky 1986). To understand the relationship between texts and L2 writers, sociolinguists adopt a linguistics lens, which enables explorations of how L2 writers respond different complex dynamic systems through texts. Ivanic (1998) describes four types of L2WID to illustrate writers' different positions. Gee (1999) claims that texts present their writers' social languages in different discourses. He develops Discourse analysis as distinct from traditional discourse analysis, arguing that all language activities have social meanings, which includes verbal and symbolic presentations. Therefore, considering language users' social states within the giving discourses enacts the exploration between identity and L2 writing. Matsuda (2015) extends the notion of "voice" to conceptualize written identity as "the amalgamative effect of the use of discursive and non-discursive features that language users choose, deliberately or otherwise, from a socially available yet ever-changing repertoire." Matsuda (2015) provides a phenomenological lens and synthesizes four features of written identity, adapted and rewritten as:

(1) L2WID is associated with texts. Texts are analytic resources that reveal L2 writers' identities.

(2) L2WID is multi-dimensional and dynamic in the L2 writing trajectory.

(3) L2WID is socially constructed for communicative purpose. All L2 writing formats are performed for meaning making with targeted readers.

(4) L2WID is a constructive process with socio psychological, sociocultural, and sociolinguistic viewpoints.

Next, three features of L2 complex dynamic writing – heterogeneity, attractors, and agency, are revisited to reconceptualize with L2WID. I review scholarly work (Dörnyei, Henry, and MacIntyre 2015; Gee 2011; Ivanic 1998; Matsuda 2015; Norton 2013) particularly related to L2WID and aligned with the notion of L2 complex dynamic writing.

3.2. *Heterogeneity and L2WID*

Heterogeneity indicates the complexities of human mechanisms and situated environments listed on Table 1. L2W processes are unlikely to be defaulted and programmed because individuals face different environmental demands and develop different language acquisitions. These heterogeneities therefore substantially result in the emergence of L2WID and L2 complex dynamic writing.

Language learners' heterogeneities are multi-directionally interacted and do not develop independently. Larsen-Freeman (2012) takes cancer as an example to

describe the heterogeneity of interaction between internal mechanisms and external influence. Cancer cannot be diagnosed as a result of biological or environmental effects. Cancer is not a disease that can be directly proved by the logic of inside/outside dichotomy.

Therefore, emerging L2WID from both internal and external perspectives helps L2 writers self-organize and maintain the equilibrium of L2 writing process. I will discuss L2WID from the perspective of internal mechanisms and external influences. However, it is significant to restate that identity is multi-dimensional and interrelated. The sectional discussions of different types of L2WID are ultimately emerged rather than segregated.

Internal mechanisms relate to individuals' learning aptitudes, intrinsic motivations, and emotions. These biological traits significantly relate to individuals' socializations and consistently affect their language investments (Mitchell, Myles, and Marsden 2013; Norton 2013). The sociopsychological perspectives on L2WID historically traces back to the notion of "self" and its connections to writers' cognitive abilities, including memory and meta-cognition. This view regard identity as a reflection of individuals' awareness and capacities of responding environments. As Markus and Nurius (1986) note, "possible selves are not well-anchored in social experience, they comprise the self-knowledge that is most vulnerable and responsive to changes in the environment. They are the first elements of the self-concept to absorb and reveal such change" (P.956). Unlike traditional psychologists, internal mechanisms cannot be regarded as fixed and periodical; rather, they are constructed by environmental responses and self organization (Larsen-Freeman 2015). L2 writers' motivations, learning aptitudes, and emotions vary due to individuals' primary managements of self-knowledge when changes occur in their L2 writing discourses. Writers cannot be dichotomously categorized as motivated/unmotivated, inherited/non-inherited, or developed/undeveloped.

Matsuda (2015) adopts a sociolinguistic perspective and explains the relations between L2 writers' internal mechanisms and texts. He categorizes L2WID orientations as personal or social-constructionist. Personal-oriented L2WID refers to notions of individuality and subjectivity. As Weedon (1997) notes, "subjectivity is defined as the conscious and unconscious thoughts and emotions of the individual" (p.32). This line of thinking highlights L2 writers' writing autonomies in terms of uniqueness, originality, and authenticity. The tendency of personal-oriented L2WID is presented in informal and non-academic genres, such as autobiography and creative writing (Matsuda 2015).

External influences of L2 complex dynamic writing include field, economics, finance, ecology, spoken interaction, and classroom language learning listed on Table 1. These influences are associated with L2WID in both sociocultural and sociolinguistic perspectives. Scholars (Gee 2000; Matsuda 2015; Norton 2013) theorize the relations between L2WID and external influences in different aspects. Gee (2000) categorizes four types of identity: nature identity, institution identity, discourse identity, and affinity identity. Nature identity mostly connects to internal

mechanisms. The others are social constructed and reflect on external environ-ments. Nature identity reflects the natural physical elements and psychological mechanisms of identity. One's color, gender, race, physical traits, innate abilities, and learning aptitudes are all a part of nature identity. Institution identity relates to one's position in a given context. One's position is authorized by institutions and acknowledged by society. Discourse identity is associated with languages, materials, activities, semiotics, and sociocultural aspects (Gee and Green 1998). To recognize one's discourse identity, one must attend to the topics raised in daily conversations, the speakers' tone, and the language used. Affinity identity reflects one's communities of practice, such as the information that individuals share and the groups to which he or she belongs (Gee 2000). Unlike institution identity, affinity identity does not necessarily involve official practices or authorized activi-ties. It may connect to institution identity, but does not speak to the credibility or reliability of the results (Gee 2000). Gee's (2000) identity theory to some extent aligns with CDS for its openness and transdisciplinary; however, it lacks detailed discussion of interactions between discursive and non-discursive identities. For example, it does not address how institution identity and affinity identity affect discourse identity and reflect on L2WID.

The impact of institution identity and affinity identity on discourse identity reveals that L2 complex dynamic writing involves different types of writing genres in multiple settings and that these complexities allow L2 writers comprise and coadapt multiple identities to reach writing goals and present voices. For example, academic writing and digital writing present different repertoires; these circumstances show L2 writers' discourse identities regarding social language use in different situated written discourses. Matsuda (2015) and Norton (2013) provide their perspectives on how L2WID responds to external influences and the relations among text, identity, and society.

Norton (2013) provides a comprehensive framework to position L2 writers' identities in daily practices, particularly in gender, class, and race. She uses the term "power" building on the studies of Bourdieu (1984) and Weedon (1997) to describe relationships among individuals, societies, and symbolic resources. She argues that it is unrealistic and problematic to over-focus language activities on formal discourse (classroom settings). In fact, L2 writing practices are exercised in both formal and informal pedagogical settings.

Liu (2011) indicates that power differentiations between L2 writers and readers result in different identity constructions. She pairs non-English native speakers (NENSs) and English native speakers (ENSs) as pen pals, and then interviews them across two semesters. Her analysis reveals that some NENSs accommodate writing strategies and modify writing content to increase mutual understanding. NENSs are prone to use more alternative writing strategies, such as adding symbols to demon-strate facial expressions and using informal etiquette to communicate. However, in some cases, NENSs feel that ENSs take advantage of English and are unwilling to understand the difficulties they face as NENSs. For example, one NENS feels that she

is subordinate in her pen pal relationship. She feels that her pen pal gives a perfunctory reply when she brings up cultural topics in their conversations. In addition, she feels that she is a tutee, responsible for enriching the dialogue by improving her English-writing proficiency. Liu's study (2011) corresponds to Norton's (2013) definitions of power, associated with individuals, society, and symbolic resources. The pedagogical discourse designed by Liu (2011) reflects on Norton's later justification of the emergence of social identity and cultural identity. The email communication she studied communicated power of language status, cultural repertoire, and language proficiency. These associations complicate L2 writing process and affect L2 writers' identities.

Norton (2013) reconceptualizes identity as three features: the multiple, non-unitary nature of subject, and subjectivity as a site of struggle and subjectivity as changing over time (p161). The first and the second features evidently support the feature of heterogeneity of L2 complex dynamic writing. The next section addresses the third feature to explain its relevance to attractors of L2 complex dynamic writing. Norton (2013) uses qualitative data to explain how different L2 learners position themselves in the given learning communities based on their SES (field, economics, finance, and ecology – see Table 1) to respond, resist, or adapt to the environmental demands (spoken interaction and classroom learning – see Table 1). Norton's (2013) identity theory decentralizes identity as unitary with evidence of extensive narrative accounts, revealing that L2WID is heterogeneously, dynamic, and multiple-faced presented.

Matsuda's (2015) identity framework can be used to explore L2WID and its relevance to external influences of spoken interaction and classroom learning in L2 complex dynamic writing. Two studies (Matsuda and Tardy 2007; Tardy and Matsuda 2009) investigate journal reviewers' perspectives on writers' voices through submitted manuscripts, which can be regarded as projected self in terms of discursive features (language background, sentence structure, editing, and writing style) and non-discursive features (knowledge, topic choice, representation of the field, description of the research setting, theoretical framework, and research method). In Matsuda and Tardy's (2007) study, the reviewers offer comments based on the voice of the writer's manuscript and their comments position their academic states through discursive and non-discursive written texts. However, I argue the power differentials between journal editors and academic writers are minimal due to the similarity of educational training and symbolic resources. Particularly, journal publication has limited genre and the power inequality limits writers' agency. Since the reviewers and the manuscript writer Matsuda and Tardy (2007) describe are all male English speakers, their study made a limited contribution to L2WID. Tardy and Matsuda (2009) use mixed methods to survey 113 reviewers internationally and conclude that writing identity is both autobiographical and constructed since reviewers rank the top three identifiers for writers' identities as experience, discipline, and language background. L2WID interplays with L2 writers' external influences, including discursive and non-discursive presentations.

3.3. *Attractor and L2W identity*

The notion of attractors closely relates to the concept of time. Changes in the giving system drive attractors; individuals are capable of self-organizing these changes and stabilizing attractors (Dörnyei, Henry, and MacIntyre 2015; Larsen-Freeman 2012; Norton 2013). In the L2 complex dynamic writing context, when three types of attractors occur in L2 writers' discourses, individuals coadapt theses attractors and exercise their agencies to behave in preferred or possible actions on the texts and response to environmental demands (Larsen-Freeman 2015; Larsen-Freeman and Cameron 2008). I draw on sociopsychological, sociocultural, and sociolinguistic perspectives on L2WID to discuss how attractors, particularly the notion of time, affect L2 writing processes and L2WID.

Time is an essential element that the early SLA theorists exclude, as Larsen-Freeman (2012) argues, quoting Elman (2003) as follows: "Development: It's about time…. The tendency to student development as if it were a succession of snap-shots – frozen in time and fixed – is more than odd" (P. 430). Norton (2013) particularly argues that the notions of motivation and learners' attitudes are exclusively studied on changes of social space over time. Early psychologists conceptualize identity in stages, including Erikson and Goffman, until Vygotsky who draws on sociopsychological perspective and underlines the context of social interactions (Bronfenbrenner 1979). Later, Bronfenbrenner (1979) revises his ecological theory after 15 years with Ceci to highlight the notion of time in his later justifying bioecological theory (Bronfenbrenner 2004). Although some sociopsychological scholars pay attention to time as a way of exploring language learning context, they have not addressed the dynamic relations between L2WID and L2W.

Complex dynamic writing processes involve L2 writers' psychological developments in terms of motivation, learning strategies, and aptitude. Arguably writers' identities are regarded as fixed when attractors occur. Mitchell, Myles, and Marsden (2013) suggest that longitude research method has enabled researchers to track learners' identities over time. For example, Csizer and Dornyei (2005) theorize a model of L2 motivational self based on CDS, which offers a framework for socio-psychologists who are interested in L2 complex dynamic writing to explore writers' identities. Under the model of an L2 motivational self, Nitta and Baba (2015) use mixed methods to investigate two Japanese college students enrolled in a Test of English for International Communication course and explore their self-regulatory L2 writing processes. The study uses interviewees' L1 reflections, L2 writing texts, and self observations to analyze their L2 selves' distribution curves over a semester. Interestingly, self-regulatory capacity is regarded as an important component in L2WID construction and it is regarded as major differences among writers. In addition, the study explores the dynamic relationships between self-regulation, L2 self, and writing task execution, and demonstrates L2 writers' coadaption over time.

Norton (2013) uses a sociocultural perspective to trace immigrant L2 speakers' identity changes over time. She uses a longitudinal study to analyze the site of

struggles of L2 learners in the time scale. Time allows L2 learners to coadapt multiple identities and justify their responses to the given social contexts. Norton (2013) and Tu (2016) evidently illustrate that changes are constructed by time and social interactions, rather that as a single result of psychological developments. In other words, a learner's chances of motivation, attitude, and aptitude are interconnected with the power of social relations.

Eva is one of Norton's (2013) interviewees. Over the course of the study she moves to Canada and obtains a job in a restaurant, which changes her identities. The move makes her an illegitimate English speaker (immigrant); the job makes her a multicultural citizen (valued co-worker). As she describes:

> I didn't talk to [my coworkers], and they didn't ask me, maybe they think I am just like – because I had to do the worst type of work there. It is normal. (p.99)

The manager knows that I can do everything – for example prepare, that I have the responsibility to prepare everything that has to be prepared. She, like, talks to me and I feel, like, more comfortable than with her, and sometimes when for example, during the break time, she says we have to do this, for example the onions, I already know but she might not know because she cannot notice everything. (p.105)

Tu (2016) interviews college students who learn Mandarin as an L2 in the United States and China. One of her interviewees, Abby, who is an English speaker, changes her L2WID over a semester because of conflicts with her instructor. Whereas he had been a motivating factor and she had been strongly interested in Mandarin, she quit her Mandarin class and stopped engaging in the Mandarin community because of her conflicts with her instructor.

> He was crazy or maybe I was being crazy. Because I met him every day, I had questions every day. I think he liked that. It made him feel good being a teacher. I think he found it was rewarding. I asked the most retarded questions. He loved these questions. He loves it. (P.85)

> I am an English person. But it is like he forgot. I have certain – I have mental baggage.… I have offended him on many, many levels. I disrespected him as a teacher. This is understandable. But I don't know if I offended him as far as his manhood?… I need to show that he is the superior one. And I respect him in the Chinese way….. I don't think I will enroll [in] Chinese next semester since I will deal with [this situation]. (p.89)

Matsuda (2015) does not emphasize the notion of time but recognizes the change of identity by using Ivanic's (1998) theory to support the notion that "writers' identities are neither completely discrete nor mutually exclusive." Ivanic (1998) argues that writers' identities can be categorized in four ways: the autobiographical self, the discoursal self, the self as author, and socially available possibilities for selfhood/subject positions. She addresses the relationship between writers' written texts and discoursal selves using a case study of a first generation college student. The student suffers through writing processes due to multi-positioned identities and

her reaction to the academic closed-looped attractors that she experiences. Being unskilled with technology results in her detachment from the academic community, while the gap between theoretical practice and occupational experience[2] leads to her failure to complete the assignment. To some extent, she negotiates her identity and "plays the game"[3] in her writing. A love-hate relationship between her writing and identity constructs her new identity as a diploma-getter but a dishonest writer.

In sum, attractors are associated with L2WID in sociopsychological, sociocultural, and sociolinguistic perspectives in different foci. Sociopsychological theorists (Bronfenbrenner 1979; Bronfenbrenner 2004; Csizer and Dornyei 2005; Dörnyei 1998) disregard motivation and learning aptitude as fixed. Rather, motivation is dynamic and changes over time. Sociocultural theorists (Norton 2013; Tu 2016) focus on how power relations dynamically change/shape language learners' identity constructions. Although sociolinguistic theorists (Ivanic 1998; Matsuda 2015) often to focus on the interactions between discursive and non-discursive features in L2 writing processes, the attention of shifting identity in L2 writing discourses allows further research to address the interactions between changes and time.

Agency and L2WID. Agency is the ability of individuals to make choices independently. It significantly relates to L2WID because individuals make choices in a preferred or possible way, which relates to individuals' environmental attractors and heterogeneity (Larsen-Freeman and Cameron 2008). Social-psychologists, Markus and Nurius (1986) conceptualize possible selves thus:

> The cognitive components of hopes, fears, goals, and threats; they give the specific self-relevant form, meaning, organization, and direction to these dynamics. It is suggested that possible selves function as incentives for future behavior and to provide an evaluative and interpretive context for the current view of self. (P.954)

Markus & Nuriuss study (1986) reveals a connection between agency and L2WID. Several studies explore this connection between L2 complex dynamic writing behaviors and L2WID. For example, Piniel and Csizer (2015) use CDS as a framework to investigate the L2 writing self-efficacy of college students majoring in English within a semester. Their findings show that students maintained the same motivations but decreased their self-efficacy due to the increased difficulty of tasks. That is, students claimed to like English, but were less confident that they could write it well by the end of the semester. Increasingly challenging writing tasks made students falsely underestimate their writing proficiencies. Their strong willingness to learn to write did not decrease across the semester, but their belief in their abilities to write well gradually decreased.

While students' language learning aptitudes did not change, some students questioned or reshaped their abilities and underestimated their learning aptitude when they encountered increasingly challenging tasks. This unbalanced circumstance impacts individuals' L2WID and may result in shaping possible selves differently. Over time, a student who keeps failing her writing assignments, experiencing

frustration with learning advanced tasks, and finding herself in discouraging environments may question her ability to learn an L2 because of these circumstances. Additionally, the uncertainty of learning aptitudes can result in learning difficulties. The complex ecologies may affect their identity constructions, including what they connect to their agency as L2 writers (Tu 2016).

Unlike sociopsychologists, sociocultural theorists emphasize the impacts of environmental demands and argue that the inequality of educational settings disadvantaged L2 writers' agencies. Norton (2013) highlights a changing quality of a person's identity, calling on scholars to recognize L2 learners' struggles as they observe how L2 learners create and respond to opportunities to use their target languages. Her viewpoint provides a range of historical and social spaces to investigate L2 writers' possible and preferred types of agency.

Norton (2013) uses narrative accounts to demonstrate how language learners contradictorily present their identity in different contexts and how these responses relate to their preferred and possible agency. In particular, preferred and possible agencies significantly influenced learning investments. One of Norton's (2013) interviewees, Katrina, has multiple identities (as a mother, an immigrant, an English learner, and a Polish teacher) that created conflicting feelings about learning and speaking English. She struggled about whether to speak English with her daughter; as a mother she wanted to impose a "Polish-only" policy at home to force her daughter to engage in Polish culture. But as a former Polish teacher she is motivated to learn English and take a computer class in English to advance professionally. Although Katrina exercises her preferred agency to improve her English knowledge, she ends up dropping her ESL course because of a conflict with the instructor, who cautioned her to be aware of her "immigrant English" which might lead her to fail the computer class. Katrina felt the instructor disrespected her professional identity through this remark. Thus, the struggle of Katrina's immigrant identity and professional identity resulted in her discontinuing learning English. The relationship between Katrina's identities and social interactions affects her decisions based on preferred and possible agencies.

Sociolinguistic theorists Matsuda (2015), Ivanic (1998), and Gee (2011), explore the relationship between discursive expression and agency more than other theorists. However, only Matsuda (2015) explicitly recognizes non-discursive influences on L2WID. He writes:

> Identity in writing is situated not just in the text itself but in the larger context of immediate interaction, it defies easy codification. Even with the difficulties, it is important to account for the place of identity in assessing the quality of writing because the perceived identity of the writer does play a role in how reader[s] evaluate and act on a piece of writing. (p.151)

This argument is compelling because it points out the current L2 writing assessment exclusively measures writers' identity and overfocuses on outcome performance.

Discourse analysis (Gee 2011) provides an analytic tool to inclusively investigate discursive and non-discursive account. The dynamic relations in L2 writers' writing discourses are considered; Gee (2000, 2011) further explains the relevance of agency and discursive expression notion of "heteroglossia" to describe the fact that people who speak the same language use different utterances in unique contexts. These varying systems of interpretation result in different meanings of words as they circulate among speakers. Gee (1999) claims that meanings can be described as "general meanings" or "specific meanings" (or situated meanings) (p. 54). The former indicates the common explanations that dictionaries offer, whereas the latter points to the situated and specific meanings that function within particular contexts (Gee 2011). Gee (1999) defines situated meaning as "an image or pattern that we assemble on the spot as we communicate in a given context, based on our construal of that context and on our past experience" (p. 94). Gee's (1999) study evidently supports that agency can be exercised in a preferred and possible way based on past experiences and social interactions.

Ivanic (1998) investigates eight scholars' essays in three fields to examine how the authors position themselves in their texts, including objects, genres, and lexico-syntactic features. Using text analysis, Ivanic (1998) finds that "a range of alternative exists within the academic community" (p295) and that scholars likely align with the specific writing disciplines in their fields. He also claims that writers tend to shift identities in one piece to another, which evidently supports that L2 writing is a complex dynamic process exercised by writers' preferred and possible agencies. As Ivanic (1998) describes:

> The idea of multiple identities is not simply a matter of different writers in different fields of study being positioned differently from each other: individual writers often shift identity within a single piece of writing (p.295)

L2WID can be performed in preferred and possible way on texts and it shifts when attractors occur in the given context for self-organization.

4. Implications

This section crystallizes the argument of this study and summarizes the literature reviews regarding L2 complex dynamic writing and L2WID. It also provides implications for further explorations of this topic. Conclusions contain the above perspectives and make recommendations for future studies.

4.1. *Summary of the argument*

The study mainly argues that the applications of CDS on L2 writing seldom consider the components of L2WID. While CDS has been increasingly applied to formal and informal L2 writing educational settings, L2WID should be recon-ceptualized with L2 complex dynamic writing. The development of SLA

historically sustains the effects of sociocultural influences in addition to psychological developments (Bronfenbrenner 2004; Mitchell, Myles, and Marsden 2013; Van Lier 2000). Larsen-Freeman and Cameron (2008) innovatively integrate the notions of biology, ecology, and psychology in the form of CDS and recommend it to the SLA researchers. Scholars (Dörnyei, Henry, and MacIntyre 2015; Henry 2015) applied CDS to investigate studies on L2 writing and argue that Larsen-Freeman draws little attention to L2WID. Therefore, this study reviews relevant studies and reconceptualizes a framework by emerging L2 complex dynamic writing and L2WID.

4.2. *Synthesis of the findings*

Heterogeneity, attractors, and agency serve as the three significant features of L2 complex dynamic writing. Multiple studies (Henry 2015; Liu 2011; Nitta and Baba 2015) indicate that L2 writing processes vary due to the abovementioned features. However, a lack of relational inferences between L2 complex dynamic writing studies and the notion of L2WID exclude the influences of subjectivity. Therefore, this study reviews multiple studies (Gee 1999; Gee 2000; Ivanic 1998; Kramsch 2013; Matsuda 2015; Norton 2013) and categorizes L2WID in sociopsychological, sociocultural, and socio-linguistic dimensions to emerge in L2 complex dynamic writing and theorize as a framework.

First, individual heterogeneity presents in internal mechanisms and external environments. L2WID studies discuss the internal and external effects of individual heterogeneity in L2 writing. Three scholars address the relevance of L2 writers' internal mechanisms and L2WID from different perspectives. Norton (2013) replaces the notion of motivation with investment because individuals' intrinsic motivations cannot be simply measured regardless external influences, which relates to the notion of "possible selves" that Markus and Nurius (1986) develop. They describe how social experience shapes individuals' self knowledge and then influences internal mechanisms. Matsuda (2015) categorized written identity in personal and social-constructionist orientations. Personal orientation highlights L2 writers' writing autonomies in terms of uniqueness, originality, and authenticity, which significantly relates to L2 writers' internal mechanisms. Other scholars (Gee 2000; Matsuda 2015; Norton 2013) theorize different aspects of the relations between L2WID and external influences. Gee (2000) develops four types of identities but does not fully explain their interrelations whereas Matsuda (2015) and Norton (2013) highlight the external influences in the different categories that appear in Table 1. In particular, Liu's (2011) study evidently supports Norton's (2013) identity theory; other studies (Matsuda and Tardy 2007; Tardy and Matsuda 2009) support Matsuda's (2015) notion of voice.

Second, attractors occur in L2 writing discourse because of the variables of time and change. Larsen-Freeman (2015) claims that individuals are capable of self-organization. L2WID studies offer narrative accounts as evidence to describe how changing identities and time affect L2 complex dynamic writing (Csizer and Dornyei

2005; Ivanic 1998; Nitta and Baba 2015; Norton 2013; Tu 2016). More importantly, L2WID studies investigate the meaning making processes in-depth and conclude that L2 writers' self-organizations may result from time or struggles. Norton (2013) and Tu (2016) offer, respectively, narrative accounts of a Mexican immigrant language learner who lives in Canada and a Mandarin learner who is a college student in the United States. Both learners change their learning motivations and stop investing their target languages because of attractors that occur in their complex dynamic writing processes. Nitta and Baba (2015) use a model of the L2 motivational self that Csizer and Dornyei (2005) theorize and conclude that self-regulatory L2 writing is a dynamic process for its dynamic relationships among self-regulation, L2 self, and writing task execution over time. Matsuda (2015) revisits and restates four types of written identity that Ivanic (1998) develops and reveals that "writers' identities are neither completely discrete nor mutually exclusive" to claim the features of attractors in L2 complex dynamic writing.

Last, L2 complex dynamic writing is most likely to perform preferred or possible actions due to L2 writers' agency. L2 writing studies extensively explain individuals' psychological performances and their connections with environmental effects. Moreover, L2 writing theorists analyze the influence of L2 writers' SES on their writing decisions and how their agency affects the variation within their texts (Gee 1999; Ivanic 1998; Markus and Nurius 1986; Matsuda 2015; Norton 2013; Piniel and Csizer 2015). The notion of possible selves suggests that it serves as an incentive "for future behavior and to provide an evaluative and interpretive context for the current view of self" (P.954). Piniel and Csizer's (2015) study illustrates that L2 writers' self-efficacies relate to their agencies, whether students prefer to retain motivations or possibly decrease motivation for the increased difficulty of tasks. Norton (2013) uses Katrina's life story to present a changing quality of language learners. While Katrina faced conflicts between professional identity and immigrant identity, she exercises her professional identity to defend her immigrate identity, which affects her decision making. Matsuda (2015), Ivanic (1998), and Gee (2011) underline the importance of discursive and non-discursive expressions and their relevance to L2 writers' agency. Gee (2011) offers Discourse analysis to examine linguistic and symbolic resources of L2 writers and these resources serve as attractors that affect L2 writers' agency. Ivanic's (1998) investigation of eight scholars' essays in three fields of study shows that writers position themselves in preferred academic discourses but vary in possible agencies.

4.3. *Conclusions*

This study has several implications to be applied to the field of L2 writing study. First, L2WID merits greater attention because of its complexity in relation to psychological developments, sociocultural effects, and subjectivity of voice. Emerging L2WID and L2 complex dynamic writing offers an inclusive framework

for those who are situated in L2 writing formal (classroom) or informal (social media) discourses to examine the power relations among L2 writing texts, selves, and relationships in their writing discourses. L2 complex dynamic writing is a transformative process associated with language and symbolic expressions, including feeling, value, thinking, experience, action, and belief.

Formal L2 writing setting is directly associated with academic writing. The 5 Cs' standards of the American Council on the Teaching of Foreign Languages (ACTFL) suggested that L2 classrooms are supposed to create communication, communities, cultures, comparisons, and connections. Accordingly, emerging L2 complex dynamic writing and L2WID allow educators to accomplish the 5 C goals and renovate pedagogical practices.

L2 writing activities are performed in various informal L2 writing settings, particular in digital discourses. Therefore, L2 writers' heterogeneities, attractors in L2 writing discourses, and agencies are dynamically interrelated with L2WID. This framework fundamentally theorizes the non-linear features of L2 complex dynamic writing with consideration of L2WID. But questions remain regarding research methods. In particular, L2 writing in digital discourses are active but insufficiently explored. Future studies should investigate and contribute to the field of L2 complex dynamic writing.

Notes

1. An attractor is a part of particular behaviors or a pattern of movements in systems, which are the modes that the system prefers.
2. The interviewee is a social worker before she enrolls in the social work department. She thinks the theory isn't useful in her workplace, and she feels her work experience disconnects with her study.
3. She regards the social science writing discipline as a game that applies a theory to convince a reader, whether or not it is practical in the workplace.

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