Complex Dynamic Systems Theory (CDST) is a transdisciplinary systems theory. A system is made up of heterogeneous constituents, which are interdependent. The constituents are understood in relation to one another. Systems theorists adopt a holistic view of a phenomenon, rather than breaking it up into its component parts.

CDST theorists maintains that these characteristics are also true of language. Adding “complex” and “dynamic” to systems theory results in understanding language as a complex adaptive system (Ellis & Larsen-Freeman, 2009). Its form-meaning-use patterns dynamically emerge from the iterative interaction of its particular users in particular contexts. The upward emergence of novel patterns is constrained by downward causation, in which the language-using patterns entrain further emergent patterns. The cycle is known as reciprocal causality and is characteristic of self-organizing systems (Larsen-Freeman & Cameron, 2008). While some patterns achieve stability, none are static. Instead, we might think of them as patterns in the flux. CDST is a theory of change, processual in nature. CDST posits that the same process accounts for language change, language evolution, and language development.

A complex system is also adaptive; it evolves in response to a continually changing environment. The environment itself changes in co-adaptation between the speaker and the context. Speakers’ agentive behavior is based on their past experience, and current and past interactions together feed forward into their future behavior. The initial conditions of a speaker’s language system are formative, leading to distinctive attractors. However, the initial conditions of a system are always being updated; what ensues, therefore, is continual transformation of the current state.

Second language learners are unique, as are their experiences and goals. Therefore, there are distinctive features of their evolving language resources, resulting in inter-individual differences. Learners’ language resources are also characterized by continuous nonlinear growth over time. These same factors produce patterns of intra-individual variability over time as well. It is this variability, as evidenced in different learning trajectories, that CDST researchers seek to better understand. In so doing, CDST privileges the individual communicative agent, demonstrating that what happens at the group level does not apply to any single member of the group (Lowie & Verspoor, 2018). All communicating agents are uniquely situated in time and space. When multiple languages come into play, there is interaction among these as well.

CDST rejects the brain/mind dualism. In order to explain language and its development, it is not just the brain, not just the body, but the brain-body-environment (Gallagher et al. 2013). Rather than seeking to understand complexity through reductionism, which has been the way in which many disciplines operate, it is maintained that the world today requires a complementary holistic, ecological, and relational systems account. This means that while some SLA researchers will continue to identify new variables and study extant ones, others will not simply focus on one component of a complex developing system but rather will look at the changing relationships among many of them. As an ecological theory, CDST recognizes that second language development does not take place in static isolation from what is happening in the temporal and spatial environment in which it is situated. Rather, it is emergent from and dynamically interconnected with the environment (Larsen-Freeman, 2018).