

Complex Dynamic Systems Research: Some Insights on Data Analysis

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Acquiring a second language (L2) has been increasingly recognized to be an ongoing developmental process, one that progresses in a fluid and non-linear fashion (Larsen-Freeman, 2015). Instead of operating like a mechanical black box that parses incoming linguistic information and outputs oral/written language indiscriminately, the learner's developing system has been shown to be selectively adaptive (e.g., Han & Selinker, 1999; Schachter, 1974; Slobin, 1996). Where variability in acquisitional data arises, more than one of the following factors are likely involved: crosslinguistic influence, avoidance, conceptual transfer, among others. For this reason, research adopting a Complex Dynamic Systems approach to data analysis has gained sway in Second Language Acquisition (SLA) in recent years. Unlike most existing empirical L2 acquisition studies that employ only a single method of data analysis, L2 Complex Dynamic Systems research advocates the application of multiple data analysis methods to the same set(s) of empirical data. In doing so, researchers are more likely to gain a multidimensional and finer-grained grasp of what the empirical L2 data might in fact be suggesting about the learner's developmental trajectory.

Ahmed (this issue) utilized a Complex Dynamic Systems approach to explore the intercultural communication between two college students: one a first language (L1) Chinese speaker who was also an L2 English learner; another a Spanish/English bilingual speaker. The study sought to determine the extent to which the L2 English learner had acquired the preposition *in* in terms of form, meaning, and use. The written production data, which took the form of email correspondences over a period of nine weeks, constituted meaningful, communicative discourse using the target language (TL) (i.e., English). Topics discussed included movies, city life, food, national holidays or celebrations, and the cultural meaning of colors. The data collected were analyzed for the acquisition of form via Target-Like Use (TLU) Analysis, of meaning via Form-to-Function Analysis, and of form-meaning-use mapping via Metaphor Analysis. The results revealed the following about the L2 English learner, Belinda: (a) form-wise, she failed to meet the 90% accuracy rate in the obligatory contexts of the target form; (b) meaning-wise, she used *in* as a preposition consistently in all her written production to indicate specificity of time, place, and manner; (c) use-wise, she demonstrated emerging proficiency in the usage of *in* beyond literal comprehension and production. The researcher concluded that even though the L2 English learner did not attain target-like mastery of *in* across the domains of form, meaning, and use, her level of linguistic and conceptual knowledge vis-à-vis the target form still enabled her to engage in meaningful cultural interaction.

Ahmed (this issue) showcases the unique value of empirical studies following a Complex Dynamic Systems Theory framework in data analysis and interpretation. Specifically, the fact that the set of written email production data was analyzed not just from one analytical perspective—but three—opens up new potentials for triangulation. Triangulation in most extant L2 mixed-methods acquisition studies typically involves the use of multiple data sets that are oftentimes different in nature (e.g., quantitative versus qualitative). The caveat in doing so, however, is that researchers may be tempted away from examining the primary data set to its full potential through a variety of possible lenses in the first place. In contrast, Ahmed (this issue)

sought to strengthen the validity of the research conducted by presenting an in-depth, threefold interpretation of the same set of email correspondence data. The application of multiple data analysis methods to this same set of data yielded rich insights into the L2 English learner's interlanguage development (Selinker, 1972). Importantly, the failure to hit the benchmark accuracy rate in the form-based TLU analysis does not necessarily imply that the learner only had a minimal handle of the semantic meaning and pragmatic use (i.e., form-meaning-function relations) of *in* when communicating in the TL. Instead, the learner may be more precisely described as having a differential grasp in the domains of morphosyntax (grammar), semantics (literal meaning), and pragmatics (metaphoric meaning) vis-à-vis the linguistic target *in* during the course of the empirical investigation. The saying “there is more (semantics and pragmatics) than meets the eye (morphosyntax)” thus applies in this case.

That given, there are also areas in which Ahmed (this issue) requires more rigorous considerations. One would be the necessity to keep a full documentation of all the discourse contexts within which each usage of *in* by the L2 English learner and her native-speaking counterpart takes place. The purpose is not so much to gauge the effects of input as to assess the role of affordances in the intercultural exchange. Considerations for input effects are beyond the scope of Complex Dynamic Systems investigation given the focus on learner-internal developmental trajectories. The concept of *affordances*, defined as opportunities for L2 learning that take place (van Lier, 2000, as cited in Larsen-Freeman, 2015), appears to be particularly pertinent in the context of intercultural communication. In Ahmed (this issue), the discourse contexts involved (e.g., narratives versus non-narratives), as opposed to the discussion topics (e.g., movies, city life), are purportedly what constituted affordances for the L2 English learner. To gain a comprehensive understanding of the L2 learner's level of interlanguage development over time, being able to account for why—and *why not*—the linguistic target was used in a specific discourse context (e.g., narrative about a movie scene) at a specific point in time serves as a window to uncovering such interlanguage phenomena as avoidance and conceptual transfer.

In the case of avoidance, the L2 learner may have intentionally resorted to other ways of meaning expression that do not require the use of the target form so that her output production would less likely be erroneous. In the case of conceptual transfer, while the presence of an “L1 thinking for L2 writing” (Ekiert, 2010) usage of the target form might be traceable through the metaphoric analysis conducted, the absence of usage driven by avoidance may have remained unnoticed, and thereby dismissed, altogether. The practice of documenting the larger linguistic environment in which each instance of target form appearance (coming from the native speaker) and usage (coming from both interlocutors) occurs would potentially provide more revealing insights into the L2 learner's interlanguage development.

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