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# **Studies of Fossilization in Second Language Acquisition**

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ZhaoHong Han and Terence Odlin

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## Chapter 1

# Introduction

ZHAOHONG HAN and TERENCE ODLIN

A quote from Ellis (1993) provides an apt point of departure for this opening chapter. Ellis notes:

[T]he end point of L2 acquisition – if the learners, their motivation, tutors and conversation partners, environment, and instrumental factors, etc., are all optimal – is to be as proficient in L2 as in L1. So proficient, so accurate, so fluent, so automatic, so implicit, that there is rarely recourse to explicit, conscious thought about the medium of the message. (Ellis, 1993: 315)

The above statement evokes at least two questions for us. The first is whether all learners wish to become as proficient in their L2 as in their L1, and the second whether they can be when the ‘if’ condition is met. This book is motivated by the second question, namely, whether or not learners are *able* to reach nativelikeness in their L2 as in their L1.

Thirty years of research has generated mixed responses to the question, from which two polarized positions can be gleaned. On the one hand, there are researchers who have long claimed that it is not possible for adult L2 learners to speak or perform like native-speakers (Gregg, 1996; Long, 1990). On the other hand, there are researchers who argue that nativelikeness is attainable by a meaningful size of L2 population (see e.g. Birdsong, 1999, 2004). The latter position appears to have gained increasing acceptance in recent years, as seen in the increased estimates about successful learners. For example, while earlier second language acquisition (SLA) research gave very low estimates – Selinker (1972) suggests 5%, Scovel (1988) estimates one in 1000 learners, and Long (1990, 1993) no learners at all, more recent research has yielded a much higher range, from 15% to 60% (see, e.g. Birdsong, 1999, 2004; Montrul & Slabakova, 2003; White, 2003).

What do we make of the gaps? The early, conservative estimates (e.g. below 5%) came from theorists and are largely extrapolated from the literature, reinforced by personal observations, whereas the more recent and optimistic assessments (e.g. over 15%) are based on empirical research results. Does this mean, then, that at least 15% of L2 learners will normally reach the end point depicted by Ellis above? The answer is clearly negative if we look closer at the design of the empirical studies that have generated those figures, where factors such as the nature of the population sampled could obviously affect any estimate. Furthermore, these studies largely involved use of a limited number of interpretation and production tasks. Thus, the conservative and the optimistic estimates are not really comparable. Nonetheless, both are revealing in that an estimate of 5% at the highest captures, albeit impressionistically, the likelihood that the vast majority of L2 learners fail to reach native-speaker competence. Optimistic estimates, such as over 15%, on the other hand, come from relatively successful performances of learners on limited measures. This seemingly contradictory picture is explained in Han (2004a) in a review of scores of theoretical and empirical studies from the last three decades.

Han argues for the need to represent L2 ultimate attainment at three levels: (a) a cross-learner level, (b) an inter-learner level, and (c) an intra-learner level. At the cross-learner level, L2 ultimate attainment shows that few, if any, are able to gain a command of the target language that is comparable to that of a native speaker of that language. At the inter-learner level, however, a great range of variation exists in that some are highly successful while others are not at all (Bley-Vroman, 1989; Lightbown, 2000). Then at the intra-learner level, an individual learner exhibits differential success on different aspects of the target language (Bialystok, 1978; Han, 2004a; Lardiere, this volume: chap. 3; Sharwood Smith, 1991). Success here means attainment of native-speaker competence (White, 2003). The notion of native-speaker competence is, of course, problematic in some respects and will be discussed further on (Cook, 1999; Davies, 2003; Han, 2004b).

The ultimate attainment of L2 acquisition, if there is such a thing, thus shows two facets: success and failure. This is different from that of first language acquisition where uniform success is observed for children reaching the age of five. On the ability of L2 learners to ultimately converge on native-speaker competence, White (2003) comments that 'native-like performance is the exception rather than the rule' (p. 263). The lack of full success among second language learners raises a fundamental question: why is it that 'most child L1 or L2 learning is successful,

afterall, whereas most adolescent and adult L1 or L2 learning ends in at least partial failure even when motivation, intelligence, and opportunity are not at issue and despite the availability of (presumably advantageous) classroom instruction' (Long & Robinson, 1998: 19). Even with the more optimistic estimates of success (i.e. over 15%), the difference between L1 and L2 acquisition is striking (Schachter, 1988).

As early as 1972, Selinker provided the first explanation for the above generic observation, contending that adult second language acquisition is driven by a mechanism known as the latent psychological structure. This mechanism is made up of five processes: (a) transfer, (b) overgeneralization, (c) learning strategies, (d) communication strategies, and (e) transfer of training. The five processes underlying the latent psychological structure would account, Selinker argued, for learning as well as non-learning. In regard to the latter, Selinker introduced the construct of *fossilization* to characterize a type of non-learning that represents a permanent state of mind and behavior, noting:

Fossilizable linguistic phenomena are linguistic items, rules, and sub-systems which speakers of a particular L1 tend to keep in their IL relative to a particular TL, no matter what the age of the learner or amount of explanation and instruction he receives in the TL ... Fossilizable structures tend to remain as potential performance, re-emerging in the productive performance of an IL even when seemingly eradicated. (Selinker, 1972: 215)

Although it does not define fossilization, the above conceptualization does provide a loose framework from which some inferences can be made regarding properties of the construct. Briefly, fossilization appears to have five properties (Selinker & Han, 2001). First, it pertains to IL features that deviate from the TL norms. Second, it can be found in every linguistic domain (e.g. phonology, syntax, morphology). Third, it exhibits persistence and resistance. Fourth, it can occur with both adult and child learners. Fifth, it often takes the form of backsliding.

In spite of the lack of a straightforward definition, the notion of fossilization nevertheless struck an immediate chord among second language researchers (and teachers). Since its postulation, it has been employed, widely and almost indiscriminately, to either describe or explain lack of learning in L2 learners. As Long (2003) aptly points out, the literature has seen a conflated use of fossilization as *explanans* and as *explanandum*, exploiting more of the latter than of the former.

## Is Fossilization the *Explanans* or the *Explanandum*?

Many researchers have, following Selinker (1972), conceived a causal relationship between fossilization and ultimate attainment. Lightbown (2000), for example, remarks that 'For most adult learners, acquisition stop – "fossilizes" – before the learner has achieved native-like mastery of the target language' (p. 179). Hence, in her view, fossilization means a cessation which entails a lack of success in L2 attainment (Towell & Hawkins, 1994). Interesting to note also is that often the same researchers would then attempt to explain what causes fossilization. For instance, Lightbown (2000) speculates:

[Fossilization] happens when the learner has satisfied the need for communication and/or integration in the target language community, but this is a complicated area, and the reasons for fossilization are very difficult to determine with any certainty. Recently, there has been some evidence that the interlanguage systems which tend to fossilize are those which are based on the three-way convergence of some general – possibly universal – patterns in language and some rule or rules of the target language and the native language. (Lightbown, 2000: 179)

While aware of the complications, Lightbown offers here two types of cause of fossilization: one involving psychological and social factors, and the other involving the construction of interlanguages. These types of cause are not the only explanations that researchers have advanced, however.

The survey of the L2 literature by Han (2004a) identifies well over 40 factors that putatively manufacture fossilization, and these factors cluster into environmental, cognitive, neuro-biological, and socio-affective explanations. Apparently, the level of interest in fossilization has been high, suggesting a widespread belief in its prevalence in L2 acquisition. However, one major problem evident in the literature is that researchers have not been uniform in their employment of the term. Among the variables referred to in characterizations of fossilization are low proficiency, typical errors, and ultimate attainment (for more, see Han, 2003; 2004a).

It is also clear that many have simply used the term as a handy metaphor for describing any lack of progress in L2 learning, regardless of its character – a 'catch-all' term, as Birdsong (2003) aptly deemed it. As a catch-all, its varying use in the research literature certainly diverges from the initial, though not rigorous, postulation by Selinker (1972; for review, see Han, 2004a: chap. 2). The problems engendered by varying

uses are compounded by a relative, though not total, lack of empirical studies. Not only has there been a continuous paucity of longitudinal evidence, but the existing non-longitudinal evidence is also suspect, due to various conceptual and methodological shortcomings (for review, see Han, 2004a: chap. 6; Long, 2003).

We should also note a problem that is difficult to avoid: using the verb *fossilize* risks some ambiguity, and the noun *fossilization* entails a similar risk. On the one hand, *fossilize* can denote a process, yet on the other it can also denote a resulting state. Many other verbs in English have the same potential for ambiguity: e.g. *The ice melted* (the ice may have been in the process of melting or it may have completely changed to a liquid state). In any case, the problem of conflating the *explanans* (i.e. the process) and the *explanandum* (the resulting state) is hard to avoid when English is the metalanguage used to discuss the theoretical issues.

## What is the Empirical Basis for Fossilization?

Evidence for fossilization has so far been of two types: anecdotal and empirical. Neither, however, abounds in the literature. An example of anecdotal evidence can be found in VanBuren (2001) who wrote of a friend of his from Scandinavia. This person had resided in Britain for 42 years and yet kept saying ‘The man which I saw ...’; ‘He said it when I first met him 41 years ago, and last month he was still saying it’ (p. 457). Similar anecdotes appear in Krashen (1981), Bates and MacWhinney (1981), and MacWhinney (2001). All of them seem to have one thing in common, namely, long-term stabilization of a deviant inter-language feature in spite of continuous exposure to the target language.

While the anecdotal evidence is largely based on informal, personal observations, empirical research on fossilization uses a variety of methodologies to find evidence of non-progression of learning. In brief, there have been five major approaches to researching fossilization: (a) the longitudinal approach, (b) the corrective feedback approach, (c) the advanced learner approach, (d) the length of residence approach, and (e) the typical error approach (Han, 2003, 2004a). All things considered, a longitudinal approach is arguably superior to the rest in that it holds the best promise for obtaining reliable and valid evidence of fossilization. For one thing, a longitudinal approach can simultaneously allow learners to display learning and/or non-learning. This approach thus makes it possible for researchers to detect of any form of lack of learning, and thereby to tease non-learning apart from learning. This has, at least, been the current understanding.

Accordingly, it is therefore not surprising that most of the recent studies have resorted to longitudinal data as an empirical basis for launching claims about fossilization and/or ultimate attainment (see, e.g. Han, 1998; Hawkins, 2000; Jarvis & Pavlenko, 2000; Lardiere, 1998, this volume: chap. 3; Long, 2003; Thep-Acrapong, 1990; White, 2001). By way of illustration, Jarvis and Pavlenko (2000) report on a case study of a 33-year-old woman pseudo-named Aino, a native speaker of Finnish, who had lived in the United States for 10 years consecutively. The researchers established a five-year longitudinal database of Aino's oral and written production data which provided, among other things, evidence of fossilization. In diagnosing fossilization, it is worth noting, two criteria were applied: (a) that the errors were regular, and (b) that they had persisted in the interlanguage for a number of years. By these measurements, Aino's fossilized errors included, but were not limited to, the following:

[1] Tense and Aspect

She *had called* today to say that she won't be there. (1995, 1996, 1997)

[2] Countability

I think she's got *fever*. (1995, 1996, 1997)

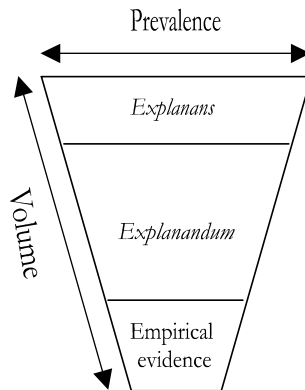
Two important observations were made on these errors. First, they 'straightforwardly represent influence from L1 Finnish'; and second, 'they alternate with corresponding target-like or correct forms' (p. 5). The former supports Selinker and Lakshmanan's (1992) Multiple Effects Principle in that L1 functions as a privileged and perhaps necessary factor in bringing about fossilization. The latter, on the other hand, appears to support Schachter's (1996) notion of 'fossilized variation' (Han, 2003, 2004a; Selinker & Han, 2001; see, however, Birdsong, 2003; Long, 2003), and/or Sorace's (1996) notion of 'permanent optionality.'

Unlike longitudinal studies which seek to first *determine* whether fossilization exists and, if it does, subsequently describe it, non-longitudinal ones *assume* that fossilization already exists, and subsequently verify it through one-time tasks. There is a fundamental difference between the two approaches in that the former is *a posteriori* and data-driven – letting the data speak for themselves, so to speak, whereas the latter is *a priori* and presumptive, influenced largely by the researchers' prior conceptions of what fossilization is. Logically, the latter approach may fall short of validity and reliability (for review, see Han, 2004a; for a recent application of the approach, see Romero Trillo, 2002).

To recapitulate, the state of the art of fossilization research, as discussed above, manifests two major weaknesses. The first is that idiosyncratic conceptualizations of the construct still prevail. A second problem is that explanation and description have been ‘flip-flopped.’ As Selinker and Han (2001) noted, ‘what we have here is not the logically prior description before explanation, but worse: explanation without description’ (p. 276). Figure 1.1 gives a visual approximation of the scenario.

The top box in Figure 1.1 signifies that fossilization has been widely used as an explanation for a myriad of SLA phenomena; the middle box shows that it has mostly been treated as an object of explanation; and the bottom box shows that it has received, relatively, the least attention as an object of empirical description.

The scenario raises legitimate questions as to whether fossilization is a viable construct or whether it should be abandoned. Long (2003) suggests that SLA researchers may eventually desist from formulating the problem as an issue of fossilization and instead address more specific concerns such as stabilization and ultimate attainment. Much of the suspicion of fossilization, as we see it, stems from a conception that is not quite accurate, which takes fossilization as isomorphic to non-nativeness. The construct of fossilization, as initially postulated and later elaborated by Selinker, refers to *a particular type of non-nativeness which comes about and persists in spite of optimal learning conditions* (Han, 2004a; Long, 2003; Selinker & Lamendella, 1978, 1979). For example, Selinker and Lamendella (1979) explain that ‘the conclusion that a particular learner had indeed fossilized could be drawn only if the cessation of further IL learning persisted in spite



**Figure 1.1** Fossilization ‘flip-flop’