CHAPTER 7

Interlanguage and Fossilization: Towards an Analytic Model

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7.1 Introduction

The process of learning a second language (L2) is characteristically non-linear and fragmentary, marked by a mixed landscape of rapid progression in certain areas but slow movement, incubation or even permanent stagnation in others. Such a process results in a linguistic system known as ‘interlanguage’ (Selinker, 1972), which, to varying degrees, approximates that of the target language (TL). In the earliest conception (Corder, 1967; Nemser, 1971; Selinker, 1972), interlanguage is metaphorically a halfway house between the first language (L1) and the TL, hence ‘inter’. The L1 is purportedly the source language that provides the initial building materials to be gradually blended with materials taken from the TL, resulting in new forms that are neither in the L1, nor in the TL. This conception, though lacking in sophistication in the view of many contemporary L2 researchers, identifies a defining characteristic of L2 learning, initially known as ‘fossilisation’ (Selinker, 1972) and later broadly referred to as ‘incompleteness’ (Schachter, 1988, 1996), relative to the ideal version of a monolingual native grammar. It has been claimed that the notion of fossilization is what ‘spurs’ the field of second language acquisition (SLA) into existence (Han and Selinker, 2005; Long, 2003).

Thus, a fundamental concern in L2 research has been that learners typically stop short of target-like attainment, i.e., the monolingual native speaker’s competence, in some or all linguistic domains, even in environments where input seems abundant, motivation appears strong, and opportunity for communicative practice is plentiful. This concern has motivated, over the past three and a half decades, multiple strands of direct and indirect theoretical and empirical inquiries into fossilization, a linguistic phenomenon manifested as:

linguistic items, rules, and sub-systems which speakers of a particular L1 tend to keep in their interlanguage relative to a particular TL, no matter what the age of the learner or amount of explanation and instruction he receives in the TL. (Selinker, 1972: 215)

Definitions (and conceptions, for that matter) of fossilization since Selinker (1972) have been various, as discussed in Han (2004). Nevertheless, in general, they have
attended to some or all of the following properties: (i) persistent deviation, (ii) resistance to external influence, including instruction and corrective feedback, and (iii) being out of the learner’s control. Furthermore, most, if not all, of the extant definitions have focused on a trend towards, rather than a fact of, permanent partial or incomplete acquisition.

Fossilization has subsequently been reported for L2 children (Plann, 1977), adolescent (Besser, 2002), and adult learners (Lardiere, 2007); for L2 naturalistic (Klein and Perdue, 1997) and instructed learners (Besser, 2002); and for second (Lennon, 1991) and foreign language learners (Mukattash, 1986). This pervasiveness of the phenomenon creates a wide concern among researchers and practitioners, and in consequence, has led to abundant speculations on its causal factors (see Han, 2004: Chapter 3). The putative factors cover an extensive spectrum, from restrictive access to memory (Ullman, 2001) and to the development and use of a private pidgin, for example, a language shared by a husband and a wife that is characterized by stable code-mixing (Tillman, 2006). Yet, the most frequently and extensively cited factors are of two general classes: L1 interference and satisfaction of communicative needs. By and large, the former has amounted to the understanding that ‘The price we pay for successful L1 acquisition (LIA) is the inability to acquire an L2’ (Eubank and Gregg, 1999: 92) and that ‘language transfer is a necessary factor in setting up fossilization’ (Selinker and Lakshmanan, 1992: 198; emphasis added). The other factor, that is to say, satisfaction of communicative needs, on the other hand, has been functioning as a chief explanation for fossilization occurring primarily in learners with abundant exposure to TL (Besser, 2002; Gordon, 1978; Klein and Perdue, 1997; Plann, 1977). Rich exposure to TL may enable the development of a functional competence but not native-like proficiency:

... a learner, having learned enough to fulfill his [communicative] needs, will stop learning, and will thereafter always speak an interlanguage with fossils. (Plann, 1977: 223)

It is generally felt that lack of linguistic precision and accuracy is what sets functional competence apart from native-like proficiency.

Importantly, however, it has also been widely and repeatedly noted that the lack of precision and accuracy is in effect selective; it appears in some, rather than all, subsystems of the interlanguage (Han, 2004; Hawkins, 2000; Sorace, 2005). In other words, individual learners do not seem to get stuck or undergo fossilization in all aspects of language learning. Selinker (personal communication, March 2008) comments that ‘To me, the evidence is so compelling that the idea that fossilization is selective has moved from hypothesis to fact; not much else like this in SLA!’ Even in the domain of morphosyntax, where fossilization has hitherto been studied the most, learners are reported to be selectively unable to fully acquire certain target features, although they may acquire other things than the expected target. The questions then arise as to (a) which subsystems tend to fossilize for which individuals, and (b) why interlanguage systems fossilize selectively the way
they do. These two cover questions have been the central themes around which much of the interlanguage research has been carried out to date.

7.2 What Drives Selectivity of Fossilization?

Theoretical perspectives on interlanguage have multiplied since the early days of SLA research (for example VanPatten and Williams, 2007). The field has made major advances, both on its own, through accumulation of empirical findings, and through increasingly interfacing with other disciplines, notably, theoretical linguistics and cognitive psychology. Consequently, a greater understanding has been achieved with regard to fossilization, reviewed in Han (2003, 2004). The discussion in the rest of this chapter draws primarily on the UG-L2 perspective to elucidate the issue of selective fossilization. A caveat, however, is in order. Because the UG paradigm has shifted over the years, the rhetoric and syntactic devices used in describing the earlier, UG-L2 research may sound conflicting with current perspectives in linguistics (Cook and Newson, 2007).

7.2.1 UG-L2 Perspective

UG-L2, as the name has it, pursues Universal Grammar — a putatively innate specification of universal linguistic principles that underlies first language (L1) acquisition — as a descriptive and explanatory framework for the nature and acquisition of interlanguage competence. Hence, the following presuppositions are made, among others. First, interlanguage competence is an abstract, unconscious system of mental representations (a grammar encompassing syntax, morphology, phonology and semantics), which underlies the L2 learner’s or user’s comprehension and production of TL. Second, interlanguage competence is constrained by the same universal linguistic principles governing the monolingual native-speaker competence. Third, UG is both a resource supplying an inventory of possible grammatical categories and features, whether syntactic, semantic or phonological, and a constraint delimiting the possible operations and options such as the presence or absence of the subject. Fourth, the task of an L2 learner, like that of any L1 learner, is to (re)acquire features that are unique to a given TL.

With these assumptions, UG-L2 research, like its L1 counterpart, has focused on resolving the so-called logical problem of language acquisition (Hornstein and Lightfoot, 1981), namely, the gap between the linguistic system developed by the learner and the learner’s exposure to linguistic experience. Empirical evidence has been found, amassed and accrued in support of the continuous functioning of UG, resulting in the understanding that UG is still available in L2 acquisition, as seen passim in the Second Language Research journal.

However, this empirical database appears peculiar, even to the most naked eye. Most striking is that it is highly selective in that, while evidence has been found of interlanguage conforming to UG principles overall, that is, operating within UG constraints, in several cases the options that interlanguage adopts vis-à-vis certain
parameters are not the ones sanctioned by the TL. In other words, in those cases the interlanguage system does not seem to accommodate or account for the input to which the learner has been exposed. Two phenomena, among others, are worthy of note. First, the system contains stabilized interlanguage forms that show resemblance to the L1 but not to the L2, for instance Franceschina (2005). Second, the system contains stabilized interlanguage forms that bear resemblance neither to the L1 nor to the L2, as shown in, say, Schwartz and Sprouse (1994). These, however, are only one facet of the selectivity noted.

A second facet of the selectivity issue is implicated in White’s observation and hence her apt questions of ‘why some learners “fossilize” with . . . divergent interlanguage grammars, whereas others successfully attain a native-like grammar; why some parameters are successfully reset whereas others are not, why positive input is only sometimes successful as a trigger for grammar change’ (White, 1996: 115). These questions allude to both inter-learner and intra-learner variations in interlanguage fossilization, and for that matter, acquisition. The two above noted facets of selectivity alone would warrant the conclusion that UG does not function in the same way in L2 acquisition as it does in L1 acquisition.

Indeed, such kind of conclusion not only exists but is also readily corroborated by several other observations. For example, a comparison between the initial and end states for L2 acquisition versus L1 acquisition shows that:

First, adult learners already know (at least) one other language: the initial state of the child and of the adult are not the same (e.g., Schwartz, 1998; Schwartz and Eubank, 1996; Schwartz and Sprouse, 1994); second, unlike children, who reach perfect mastery of whatever language they are exposed to, many adults after periods of exposure to a second language display varying degrees of ‘imperfection’ (by monolingual native standards), and even those who are capable of native-like performance often have knowledge representations that differ considerably from those of native speakers (Sorace, 1995). So not only the initial state but also the final state of the child and of the adult learner are different. (Sorace, 2003: 130)

With regard to this purported end-state, Gregg (1996) asserts that whereas L1 acquisition shows homogeneous ultimate attainment of a steady/end-state or uniform success, L2 acquisition exhibits miscellaneous end-states, often divergent from one another, and from the TL. He interprets this scenario in terms of differences along learnability factors, in particular, the initial state, input and learning mechanism. Thus, in terms of the initial state, whereas UG is uncontroversially what supplies the initial hypotheses for L1 acquisition, in the case of L2 acquisition, the L2 learner has already internalized a grammar of a specific natural language (Gregg, 1996: 57). In terms of input, L1 acquirers interact only with primary linguistic data (PLD), that is, natural exemplars of the language, but in L2 acquisition, input consists of both PLD (to a lesser extent) and negative evidence (to a greater extent), i.e., information about what is not possible in the target language (cf. White, 1996). Finally, in terms of learning mechanism, in L1
acquisition, input is analysed through a UG-based computational system, and this may not be the case in L2 acquisition, due to the pre-existing L1 experience.

Hitherto, the most comprehensive account of L2/L1 acquisition differences is to be found in Bley-Vroman’s (1989) Fundamental Difference Hypothesis, which emphasizes nine characteristics of L2 acquisition as follows: (1) lack of success, (2) general failure, (3) variation in success, (4) variation in goals, (5) fossilization, (6) indeterminate intuitions, as seen for instance in Johnson et al., (1996) and Sorace (1988), (7) the importance of instruction, (8) the need for negative evidence and (9) the role of affective factors such as anxiety and motivation. Thus, in addition to representing generic differences between L2 and L1 acquisition, this account, importantly, points up possible sources of variation, or rather, factors – unattested in L1 acquisition – that may compromise the function of UG in L2, thereby suggesting that alternative mechanisms are needed to explain L2 acquisition.

It is not the purpose of this chapter to evaluate or duplicate the historical UG debate on whether it is the domain-specific language faculty or domain-general cognitive mechanisms that drive L2 acquisition. Nonetheless, it is relevant and important to stress that the differences between L1 acquisition and L2 acquisition that are identified not only by generative researchers but also by those with other orientations (MacWhinney, 2006) point to greater complexity for L2 acquisition relative to L1 acquisition and to the likelihood that the capacity of UG in L2 acquisition is tempered by a host of confounding factors, not the least of which is the L1.

Hence, in spite of available research evidence confirming the presence of UG effects in L2 acquisition, it is likely that UG has a highly circumscribed role in L2 acquisition such that it is only partially available to the L2 learner, or it may be that structures attainable in the L2 are not only constrained by UG but by the narrower constraints imposed by the grammar of the learner’s L1’, as Ritchie and Bhatia (1996: 27) have claimed.

Recently, there has been increasing evidence in favour of the latter view. Work into the L2 initial and end-states examining the nature of interlanguage competence (i.e., addressing the logical problem), as well as work investigating parameter resetting in learners en route (i.e., addressing the developmental problem) have amply shown that L1 may function alongside UG in interaction with input, determining interlanguage competence and guiding its course of development. As will be shown below in a select review of empirical studies, L1 may interfere with the analysis of L2 input, resulting in ‘partial parses of PLD’ (Schwartz and Sprouse, 1994) and thereby difficulty and, potentially, fossilization, in parameter resetting, as described by Flynn (1987) and White (1991a).

7.2.2 Evidence from the L2 Initial State

The term ‘initial state’, and its assumed existence, refer to ‘the kind of unconscious linguistic knowledge that the L2 learner starts out with in advance of
[exposure to] the L2 input’ (White, 2003a: 58). Several studies such as Haznedar (1997), Schwartz and Sprouse (1994) and White (1985) have independently shown that L1 grammar, in part or in whole, provides the L2 initial state, which subsequently changes as a result of the learner interacting with TL input. However, the restructuring process can be selective. By way of illustration, an analysis Schwartz and Sprouse (1994) performed of data longitudinally sampled from an L1-Turkish speaker of German interlanguage reveals that with respect to German word order, the subject started off with direct syntactic transfer of L1 Turkish (i.e., SOV), which was then followed by restructuring (SVX, XSV, XVS) to gradually approximate the target word order (XVS), that is to say Verb Second. However, it was noted also that one particular interim-stage word order, XSV, stabilized. In other words, it was never ‘delearned’ (Gubala-Ryzak, 1992; Schwartz and Gubala-Ryzak, 1992; White, 1992). The selectivity of restructuring in this case, Schwartz and Sprouse argue, by no means suggests that UG (and learning principles) was inoperative but rather, that UG was applied in conjunction with the L1 grammar. Importantly, the study intimated an understanding that ‘what works as “triggering data” in L1 acquisition may not necessarily be triggering data in L2 acquisition’ (Schwartz and Sprouse, 1994: 356), and that the lack of triggering data (i.e., TL utterances that exemplify a given grammatical feature) appropriate for L2 acquisition may be a source of fossilization. Schwartz and Sprouse further point out that ‘what counts as triggering data is never absolute’ (ibid.: 356), suggesting, *inter alia*, that the function of input may be modulated by the learner’s L1, even when UG is operative, and that when this scenario takes place, fossilization is likely to obtain.

As another illustration, White (1985) undertook a cross-sectional study of the pro-drop (alias null subject) parameter (Chomsky, 1981; Jaeggli, 1982) in L2 acquisition of English by native speakers of Spanish and French. Via a grammaticality judgement task, White examined three putative clustering properties of the parameter:

(i) omission of subject pronouns (e.g., *Anda muy ocupada/*Is very busy),
(ii) free inversion of subject and verb in declarative sentences (e.g., *Vino Juan/*Came Juan),
(iii) so-called ‘that-trace’ effects (e.g., *Quien dijiste que vino?/*Who did you say that came?).

Two findings are of particular relevance. First, speakers of Spanish, a language that contrasts with English with respect to the three properties, exhibited evidence of transfer, in particular, in relation to property (i), wherein ‘beginners were most inclined to accept missing subjects in English and . . . there was a gradual improvement in ability to recognize the ungrammaticality . . . ’ (White, 1985: 53). Thus, as seen in the Schwartz and Sprouse study referred to above, the initial hypothesis in this case was L1-based and there was a subsequent restructuring in accordance with UG and input. A second relevant finding is that participants’ acquisition of the three properties was asynchronous (see also Liceras, 1989), hence yielding selectivity. Specifically, their acquisition of one property, namely (ii) subject–verb
inversion, outpaced the omission of subject pronouns (i) or ‘that-trace’ (iii). This therefore provides evidence contrary to the default UG-based prediction. Although methodological shortcomings, such as the participants being instructed learners, may have contributed to this finding, as White has speculated, it is nevertheless likely that the L1 had differentially entered an interaction with input and UG, thereby variably tempering the functioning of UG and input.

Granting the default presence of UG in L2 acquisition, it may further be hypothesized that the selectivity of acquisition (and for that matter, fossilization) depends largely (a) on the status of the L1 feature (exerting an influence on interlanguage), which can be marked or unmarked, and (b) on the nature of the input, that is to say, the potential triggering data, which can be robust or non-robust. ‘Markedness’ is, in turn, determined by frequency and variability (i.e., consistency), and similarly, ‘robustness’ by frequency and variability. Thus, an unmarked feature is one that is both frequent and consistent; input that is robust is frequent and consistent; and so on. In this light, omission of subject pronouns (i) or, strictly speaking, the presence of the empty category pro in the L1 (Spanish) is quite unmarked, that is to say, frequent yet variable to a considerable extent since Spanish allows non-omission of subject pronouns, and the L2 input (English) quite robust, viz., frequent but somewhat variable, since in informal English, one may occasionally encounter utterances containing ellipsis such as *Hope you are well.* Subject-verb inversion (ii) in the L1 is quite unmarked in that it is frequent but quite variable, and the L2 input with respect to this property is robust because it is frequent and invariable. Finally, the ‘that-trace’ property in the L1 is unmarked, viz., frequent and invariable, and the L2 input is not very robust because it is generally infrequent though invariable. This conception is schematized in Figures 7.1, 7.2, and 7.3. Based on the combined L1–L2 characteristics vis-à-vis each of the three parametric properties (i, ii, iii), it can be predicted that for Spanish speakers learning English as the L2, it will be easier to reset parametric value (ii) than (i),

![Figure 7.1 L1 markedness](image-url)
with (iii) being the hardest. Underlying this prediction, as can be inferred, is the assumption that the influence of input may prevail over the influence of the L1 when the two compete against each other. In other words, robust input may curb the tendency driven by the L1 towards a particular parametric setting. However, by the same token, non-robust input may lose to the latter, as demonstrated in White (1991a, 1991b).

Figure 7.1 shows the relationship between frequency and variability in two independent dimensions associated with L1 markedness. The horizontal axis indicates a continuum of variability, with the left end being invariable (i.e., consistent) and the right end variable (i.e., inconsistent). The vertical axis shows the continuum for frequency, going from low at the bottom to high at the top. The crossing of the two axes creates four broad categories of L1 markedness: Type I (quite unmarked: frequent but variable), Type II (unmarked: frequent and invariable), Type III (quite marked: invariable and infrequent), and Type IV (marked: infrequent and variable).

Similarly, Figure 7.2 shows the relationship between frequency and variability in two independent dimensions associated with the robustness of the L2 input. The horizontal axis indicates a continuum of variability with the left end being invariable (i.e., consistent) and the right end variable (i.e., inconsistent). The vertical axis goes from low frequency at the bottom end to high frequency at the top. The crossing of the two axes creates four broad categories of L2 input robustness: Type I (quite robust: frequent but variable), Type II (robust: frequent and invariable), Type III (quite robust: invariable but infrequent), and Type IV (non-robust: infrequent and inconsistent).

Figure 7.3 integrates Figures 7.1 and 7.2 by showing the interaction between L1 markedness and L2 input robustness, leading to four possible scenarios for L2 acquisition. These are: Type I, where the L1 is unmarked and the L2 input robust; Type II, where the L2 input is robust and the L1 marked; Type III, where the L1 is marked and the L2 input non-robust; and Type IV, where the L2 input is...
non-robust and the L1 unmarked. Each scenario may carry a different prognosis about acquisition or fossilization, a point to which I will return, after examining further empirical evidence.

7.2.3 Evidence from L2 Learners En Route

White (1991a, 1991b) set out to investigate the verb-raising parameter (Chomsky, 1989; Pollock, 1989) among child native speakers of French acquiring English as the L2, in particular, adverb placement. The verb-raising parameter has three clustering properties:

(i) adverb placement;
(ii) negative placement;
(iii) question formation.

In terms of adverb placement, English and French are similar in some ways, such as ASVO and SVOA orders, but differ conspicuously in two aspects. First, English allows SAV, *John often kisses Mary, whereas French does not, *Jean souvent embrasse Marie/John often kisses Mary. Second, in French, SVOA is a permissible word order; that is, the adverb can be placed between the verb and its direct object, Jean embrasse souvent Marie/John kisses often Mary, but the same word order is not grammatical in English, *John kisses often Mary. From a learnability point of view, there is positive evidence in the L2 exemplifying the SAV order, but absence of evidence to show the ungrammaticality of SVAO.

The purpose of White’s (1991a) study is two-fold: first, to see whether contrived input, meaning instruction entailing specially designed positive and negative evidence, may help parameter resetting, in general, and shedding the SVAO word order, in particular; second, to see whether instruction focusing on one
parametric property, namely question formation, would trigger the learning of another, adverb placement. Subjects were learners *en route*, so to speak, who had been attending an intensive English program for three months and who were native speakers of French (ages 10–12). Two experimental groups were formed out of intact classes, the adverb group and the question group, each receiving two weeks of instruction on their specific structure. In addition, a group of native speakers served as controls. Pretests and posttests, involving a battery of three test tasks consisting of a grammaticality judgement task, a preference task and a manipulation task, were administered before and after the treatment, followed by a delayed posttest five weeks after. Results show (i) that instruction on question formation did not lead to much learning of adverb placement – some learning of SAV but little with respect to SVAO – hence White’s conclusion that ‘supplying positive evidence from one of a cluster of properties relating to a parameter does not have extensive effects on the L2 acquisition of other aspects of the cluster’ (White, 1991a: 356); and (ii) that instruction on adverb placement led to both the learning of SAV and restructuring of SVAO. However, this learning did not last a year, as a follow-up study indicated: ‘Subjects instructed on adverb placement revert to the behavior they showed at pretesting, accepting and producing SVAO order’ (ibid.: 356). In short, subjects in the adverb group learned, through instruction, that SAVO, *Linda always takes the metro*, is a permissible order in English but not that SVAO is ungrammatical, *Linda takes always the metro*.

What, then, explains the selectivity attested in the adverb group? Other than the learnability difference noted above, following the hypothesis I postulated earlier (see Figures 7.1, 7.2, 7.3), SAV would fall, if anywhere, off the marked end of the L1 axis, since it does not exist in French, and on the robust end of the L2 input axis. It is, therefore, a Zone II feature (see Figure 7.3), which should be relatively easy to acquire, even without instruction. Conversely, SVAO is ‘most common in French’ (White, 1989), thus falling on the unmarked end of the L1 axis, and, if anywhere, off the non-robust end of the L2 input axis, as the word order is non-existent in the L2. As a Zone IV feature, then, SVAO is predicted to be fossilizable. Indeed, prior research such as Sheen (1980) and White (1989) has established that ‘French learners of English have problems with adverb placement, persistently producing and accepting [SVOA] sentences . . . even when they are at advanced levels’ (White, 1991a: 342).

The selective learning of SAV versus SVAO was further investigated by Trahey and White (1993), using, this time, only PLD to stimulate learning. Specifically, a technique called ‘input flood’ was employed to provide, hopefully, abundant triggering data. However, the results were virtually the same as from White’s (1991a, 1991b) study, only with ‘backsliding’ (Slinker, 1972) happening even sooner. Subjects showed signs of learning vis-à-vis SVAO but those signs started disappearing just three weeks after the period of input flood. The study led to the conclusion that:

exposure to the input flood did not permit the subjects to learn that SVAO is impossible in English; in other words, ample exposure to primary linguistic data
did not result in the mastery of the rules of adverb placement in English. (Trahey, 1996: 116)

A follow-up study a year later (Trahey, 1996) was undertaken to assess the durability of the effects of input flood (PLD) and to also compare the effects of input flood to those of instruction (rule explanation and negative evidence). Two results are particularly worth noting. First, input flood allowed the retention of the earlier noted differential effects on SAV versus SVAO. Second, input flood was more effective than explicit instruction in causing learners to retain their knowledge of SAV, but not any more effective in its ability to induce the knowledge that SVOA is ungrammatical. Therefore, both the initial and longer-term follow-up studies have confirmed the prediction that SAV is learnable through exposure to PLD, but that SVOA is largely unlearnable, whether from explicit instruction or from PLD.

Moreover, the available findings have discounted not only the usefulness of externally construed triggering data but also the possibility of learning from indirect negative evidence (i.e., absence of SVOA in the input).

Returning to my hypothesis on the synergy of L1 markedness and L2 input robustness as a determinant of selective acquisition/fossilization, Figure 7.4 illustrates the possibility that features that fall within the same zone may be acquired or fossilize differentially. This is indicated by circles separating out one linguistic feature from another. The outer circle, therefore, connotes 'greater degree of'. Thus, with respect to Zone IV, the outmost circle indicates the greatest possibility of fossilization.

What would be the features that stand in the outer circle of the fossilization zone (IV), then? An answer to this question must be sought from the strand of research examining L2 ultimate attainment, for whatever structural deviance fingers into that final stage presents the strongest case of fossilization.

![Figure 7.4 Prognoses about acquisition and fossilization](http://site.ebrary.com/id/10427333?ppg=158)
7.2.4 Evidence from the L2 End-state

UG-L2 research on the purported ultimate attainment or end-state, characteristically, focuses either on learners with long immersion (> five years) in the TL (Lardiere, 1998a, 1998b) or on learners who are near-native speakers (Sorace, 1993). The latter population usually consists of learners whose performance is judged indistinguishable from that of native speakers in certain domains of discourse. Sorace (2005: 58) states that:

Adult learners who have reached the near-native level, and continue to benefit from full exposure to the L2, can be assumed to have progressed to the furthest attainable competence level: if there are differences between their grammar and the target grammar, these differences may therefore be considered as permanent.

Extant studies conducted with this population generally confirm the conclusion that fossilization is selective. Lardiere’s (1998a, 1998b) longitudinal case study, for example, showed that the subject, Patty, an L1 speaker of Chinese with English as the L2, had fully acquired syntactic features such as nominative case marking and proper English value of the verb-raising parameter, but only partially acquired morphological features such as past-tense marking and 3rd person singular -s marking of thematic verbs. Similarly, Coppigers (1987) observed that his near-native speakers of French (from a variety of L1 backgrounds) exhibited native-like competence with regard to formal features such as the so-called A-over-A constraint seen in Cet homme, dont j’admire le tableau, est venu ici hier/This man, whose painting I admire, came here yesterday, but nonnative intuitions in relation to functional or cognitive aspects of grammar as the semantic contrasts as in J’ai rencontré /une gentile petite fille/one petite fille gentile/I met a nice little girl (see, however, Birdsong, 1992). White’s (2003b) case study on SD, an adult L1-Turkish speaker of L2-English, shows that selectivity may occur even within the same domain, in this case, inflectional morphology, to the extent that SD displayed a better control over verbal inflection than nominal inflection.

Further, and more subtle, evidence of selective fossilization can be found in Sorace’s work with near-natives. In her (1993) study, Sorace convincingly showed that both French and English near-native speakers of Italian stopped short of complete acquisition of Italian unaccusatives, though the manifestations from the two groups were different (divergence for the French and incompleteness for the English). Regardless, however, both were attributable to the influence of the respective L1 grammar (for discussion, see Sorace, 1993). From a similar L1-English population, Sorace (1999, 2003) cited instances of overproduction of overt referential subject pronouns in the near-native Italian grammar, for instance:

A: Perché Lucia non ha preso le chiavi/Why did Lucia not have taken the keys?
B: Perché lei pensava di trovarsi a casa/Because she thought she would find you at home.
attributing it again to the L1 interference. Three preliminary points are worth making on these interlanguage structures: First, they remain as options in the interlanguage grammar that surface only under certain circumstances. In other words, the interlanguage grammar in question does contain target-like variants, which, however, never reach a stable state. Second, the non-target-like variants all have exact correspondences in the relevant L1. Often, the L1 counterparts are unmarked, meaning that they are frequent and invariable in the L1. Third, they all are so-called 'interface features', interacting, in particular, with domains such as semantics and pragmatics, a point to which I return shortly. Sorace (1999, 2003) refers to these interlanguage structures as examples of 'residual optionality', a phenomenon, found at L2 ultimate attainment, whereby 'a steady state is reached in which the target option is strongly but not categorically preferred and the non-target option surfaces in some circumstances' (Sorace, 2003: 140). In addition to the L1 genesis, the lack of robust L2 input, in tandem with L2 learners' attenuating capacity for implicit learning (learning from PLD alone; DeKeyser, 2000), is assumed to account for the phenomenon.

This explanation fits rather neatly with my own hypothesis (see Figures 7.1, 7.2, 7.3, 7.4), according to which, the above-noted interface features fall squarely in the fossilization zone (Zone IV). They are unmarked in the L1 and there is no robust input in the L2 to preempt them. Take the overt subject marking as an example. In English, the L1, overt subject marking is an obligatory feature but is optional in Italian, the TL, determined largely by discourse – pragmatic conditions such as [topic shift].

Zone IV features also appear to be a case par excellence of 'transfer to somewhere' as it is termed by Andersen (1983), who hypothesizes that:

A grammatical form or structure will occur consistently and to a significant extent in the interlanguage as a result of transfer if and only if (a) natural acquisitional principles are consistent with the L1 structure or (b) there already exists within the L2 input the potential for (mis)generalization from the input to produce the same form or structure. (Andersen, 1983: 182; emphasis in original)

Relating this hypothesis to overproduction of overt subject marking as seen in the interlanguage of L1-English near-native speakers of Italian, here is what might have happened: somewhere in the course of development, there is a need to learn word order in Italian, in which case, L1-English SVO supplies the initial prop (Schwartz and Sprouse, 1994) and eventually becomes the 'default' in the interlanguage – induced and reinforced by exemplars experienced of the SVO order in the TL input (Italian), which, at the 'near-native' stage, is to be resorted to only under ‘critical’ circumstances.

### 7.3 Fossilizable Features

To date, UG-L2 studies, particularly those on ultimate attainment, appear to have converged on two types of fossilizable features: so-called 'interface syntactic
properties' and functional categories. First, with respect to interface features, Sorace (2005) proposes a useful distinction between pure structural constraints, which she refers to as 'hard' properties, and interface constraints that are governed by interpretive conditions at the interface of syntax and semantics, pragmatics, or informational structure, which she refers to as 'soft' properties (cf. Jakubowicz, 2002). She argues that the former can be fully acquired, whereas the latter are susceptible to residual optionality, that is, they may never be completely acquired. Once again, take the null subject or pro-drop parameter and near-natives of Italian as an example:

Near-native speakers of Italian overgeneralize overt subject pronouns and preverbal subjects to contexts which require null subjects and postverbal subjects in native Italian, but they do not do the reverse, namely they do not extend null and postverbal subjects to inappropriate contexts. (Sorace, 2005: 61)

While the above statement may sound too abstract to some and too simple to others, Figure 7.5 provides an illustration of the complex scenario of the selective acquisition/fossilization involved.

Figure 7.5 shows that the null subject parameter as instantiated in Italian is a soft feature; that is, its syntactic expressions interface with discourse-pragmatic factors. Selective fossilization, in this case, is discerned from the fact that in terms of syntax, there is full correspondence between the TL and the interlanguage. As Sorace (2005: 67) puts it, 'The computational features of syntax responsible for the licensing of null subjects are acquired completely'. However, in terms of usage, the interlanguage shows overgeneralization of overt subject marking and preverbal subjects to contexts requiring null subjects or postverbal subjects for fulfilling discourse-pragmatic conditions of [+topic shift] and [+focus]. Both structures are dominant in the L1, English, and importantly, fulfill both [+topic] conditions as well as both [+focus] conditions. In other words, as instantiated in English, the null subject parameter is a hard rather than a soft feature. Hence, while there is

<table>
<thead>
<tr>
<th>UG property</th>
<th>TL/IL syntax</th>
<th>TL discourse-pragmatics</th>
<th>IL discourse-pragmatics</th>
<th>Selective fossilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Null subject parameter</td>
<td>Overt subject marking</td>
<td>[+ topic shift]</td>
<td>[+ topic shift]</td>
<td>a. Che cosa è successo?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(− topic shift)</td>
<td>(− topic shift)</td>
<td>b. Gianni è arrivato.</td>
</tr>
<tr>
<td>Null subjects</td>
<td></td>
<td>(− topic shift)</td>
<td>(− topic shift)</td>
<td>a. Che cosa è successo?</td>
</tr>
<tr>
<td>Preverbal subjects</td>
<td></td>
<td>(− focus)</td>
<td>(− focus)</td>
<td>b. Gianni è arrivato.</td>
</tr>
<tr>
<td>Postverbal subjects</td>
<td></td>
<td>[+ focus]</td>
<td>[+ focus]</td>
<td>a. Che cosa è successo?</td>
</tr>
</tbody>
</table>

Figure 7.5  Selective fossilization vis-à-vis null subject parameter
some overlap between the L1 and the TL in this case, the TL is more complex than the L1, both in terms of the syntax and its discourse distribution.

Sorace’s point about interface features prone to residual problems is corroborated by an increasing number of studies such as Coppiters (1987), Hopp (2004) and Montrul and Slabakova (2003), and in consequence, research is moving towards a more granular understanding: The scope of interface has now broadened in SLA research to include the syntax-lexicon interface, the syntax-semantics interface, the syntax-phonology interface, and so forth. White (2007) differentiates between grammar-internal interfaces (e.g., syntax-morphology) and grammar-external interfaces (e.g., syntax-discourse), pointing out that not all interfaces are equal. While future research will undoubtedly seek to ascertain the effects of the different types of interface on acquisition, it is relevant to the purposes of this chapter to raise another question: Are functional categories, such as determiners and grammatical morphemes, hard or soft features? As noted earlier, this is another category of fossilizable features that UG-L2 research on ultimate attainment has identified (Jakubowicz, 2002).

To address this question, let us first turn to an observation made by White (2003a: 192):

L2 learners of various languages show relatively inconsistent, though by no means random, use of certain kinds of morphology while being very accurate on related syntactic properties which depend on properties of InfL, such as nominative case, the requirement for overt subjects, and presence or absence of verb raising. These characteristics appear to be true of initial and end-state grammars, as well as grammars undergoing development.

Studies on L2 putative end-state grammar, for instance those by Lardiere (1998a, 1998b) and White (2003), have established the following facts: first, there is variability – often manifested as co-occurrence of target-like and non-target-like tokens – in suppliance of grammatical morphemes in obligatory contexts. Second, there is dissociation between syntax and morphological marking, with the latter lagging behind. Third, there is strong persistence of the non-target-like usage. These facts are best exemplified in the subject in Lardiere (1998a, 1998b, 2007), Patty, an adult speaker of L1 Chinese and an end-state speaker of L2 English. Audio recordings of her spontaneous production over a span of 10 years consistently show (a) low and variable incidence of verbal inflections in obligatory contexts, in spite of her more than 10 years of full immersion prior and ongoing, and yet (b) complete control of associated syntactic structures. This incidence of selective fossilization is explicable in terms of interference from Patty’s L1, Chinese, which displays absence of verbal inflections (cf. White, 2003b).

The observed dissociation between syntax and morphology described above can serve as an evidential basis for arguing that morphological variability is not due to representational deficits, but rather, to processing inadequacy. Such arguments indeed exist. For one, the Missing Surface Inflection Hypothesis (Hazen and Schwartz, 1997; Lardiere, 1998a, 1998b, 2000; Prévote and White, 2000)
associates the absence of verbal morphology with the absence of surface manifestation of inflection, stressing that the related abstract syntactic representations are intact and appropriate. Simply put, this hypothesis ascribes the problem to one of mapping from abstract morphosyntactic categories and features to their surface morphological realizations. This position is, however, called into question by Hawkins (2000), Franceschina (2005) and Hawkins and Chan (1997), among others. Emphasizing the persistent and highly circumscribed scope of the problem in the end-state of adult L2A, Hawkins argues, in the name of his Failed Formal (Functional) Features Hypothesis later known as the Representational Deficit Hypothesis, that there is a critical period for the selection of parameterized formal features, and hence that specific features of functional categories, those that were not instantiated during L1 acquisition, may permanently be either absent or defective in adult L2 acquisition. This hypothesis therefore relegates persistent morphological variability to a representational deficit.

Whether the morphological problem is one of processing or representation, it is quite clear that within the UG-L2 camp, functional categories such as grammatical morphemes and determiners have generally been treated as grammar-internal, hard properties interfacing between syntax and lexicon. As such, they are considered by some to be learnable in an additive fashion, just like words (Gess and Herschensohn, 2001; Herschensohn, 2000), though Goad and White (2005) and White (2003b) advance a Prosodic Transfer Hypothesis. A notable exception, however, is the Computational Complexity Hypothesis (Jakubowicz, 2002) which differentiates functional categories that are syntactically necessary and those that are semantically and conceptually motivated, predicting that:

syntactically necessary functional categories are easier to compute than semantically modifying functional categories. The former develop earlier... Functional categories that are only projected when required by semantic-conceptual considerations develop later. (Jakubowicz, 2002: 170).

The hypothesis thereby provides an explanation for why a delay can be experienced in the acquisition of certain functional categories, and, by extension, for selective fossilization in this domain. Coppeters (1987) aptly notes that grammatical features (functional categories included) of which near-native speakers and native speakers show markedly divergent intuitions tend not only to be the ones that involve semantic contrasts but also prove ‘to be those where transfer/interference from the native language are most likely to occur’ (ibid.: 568). These views, taken together, suggest that there can be an interaction between certain L2 functional categories and an L1-based semantic-conceptual system.

Interestingly, a similar view is entertained by researchers outside the UG-L2 camp, who have begun to relate the morphology problem to the L1-based conceptual system. From a linguistic relativity perspective, for example, Han (2008) makes a case about English plural -s interfacing with the conceptual system, arguing that persistent non-target-like plural marking (and grammatical morphemes, for that
matter) in L2 production stems from the influence of an L1-based semantic and conceptual system, which hinders acquisition of discourse-distributional properties of the target form. Drawing on findings from L2 research on instructed learning, Han points out a contingency between the lack of desired efficacy of focus on form (Long, 1991) – a type of pedagogical intervention – for grammatical morpheme problems and its lack of attention on the semantic and conceptual basis of interlanguage, stating that:

Inasmuch as acquisition consists, broadly, of form-meaning associations, meaning can be a greater source of difficulty than form, and in that vein, grammatical morphemes encoding abstract notions are likely a long-lasting learnability problem for most L2 learners, due to the underlying interference of their L1-based semantic and conceptual systems. (Han, 2008: 77)

On this account, then, full acquisition of grammatical morphemes hinges on conceptual restructuring from the L1 to the L2, a long and arduous, if not impossible, process for the majority of L2 learners. According to Slobin (1996: 89),

Each native language has trained its speakers to pay different kinds of attention to events and experiences when talking about them. This training is carried out in childhood and is exceptionally resistant to restructuring in adult second-language acquisition.

Slobin goes a step further to point out that grammatical categories that are independent of ‘our perceptual, sensorimotor, and practical dealings with the world’ (ibid.: 91), such as aspect, definiteness and voice, are particularly resistant to restructuring.

Tying this perspective into the Selective Fossilization Hypothesis I have pursued (see Figure 7.4), it is clear that the issue of what constitutes the markedness status of the associated L1 form needs to be further clarified. To be sure, in assessing the fossilizability of soft features, be they syntactic properties or morphological, it is not enough to try only to ascertain their surface status in the L1 by looking at their frequency; rather, it is important to consider their discourse distributional properties. In other words, what goes into the calibration of their markedness should not only be their frequency but also their discourse-semantic and discourse-pragmatic scope. This consideration can, in fact, take place while assessing variability, the other variable of L1 markedness, for, as one can assume, the more complex the forms are in the way they are determined by discourse-semantic and discourse-pragmatic conditions, the more variable they should appear to be.

Jakubowicz’s (2002) conception of syntactic complexity, discussed in Sorace (2005), is schematized in Figure 7.6. It is helpful here in figuring out what it means to say that one form is more variable than another.

As shown in Figure 7.6, complexity is conceptualized as a continuum, with the left end marking low complexity and the right end high complexity. Grammatical
constructions with low complexity require syntactic knowledge only, whereas those with high complexity require the integration of syntactic knowledge and knowledge from other domains. Similarly, syntactic operations that are required in every sentence are not as complex as those that are optionally present for semantic and pragmatic reasons.

Thus, in light of Jakubowicz’s notion of complexity, there can be a contingency between complexity and variability such that forms that are more complex are also more variable. Thus, as shown in Figure 7.6, hard properties (see the left-hand boxes) are less complex and hence should be less variable than soft properties (see the right-hand boxes), and vice versa. This line of thinking is extendable to assessing L2 input robustness, specifically, its variability dimension (Figure 7.2). Likewise, therefore, one can argue that soft properties are more variable than hard properties.

To recapitulate the discussion so far, the UG-L2 research has generated the most systematic database of fossilization to date, within which evidence can be found for interlanguage grammars involving a variety of L1s and L2s, from the initial stage through the end stage. More profoundly, this strand of research has provided crucial insights into selective fossilization. Among them, the intersection of two factors, L1 serving as the substrate and L2 input being non-robust, seems able to account for almost every incidence of fossilization reported so far in this literature, and elsewhere (Han, 1998, 2000, 2006).

As a result of accumulative findings from UG-L2 research on ultimate attainment and similar research done within other cognitive paradigms (Han, 2000, 2006), an important trend has emerged towards conceptualizing fossilization not as an isolated, performance-only phenomenon, but rather, as a competence phenomenon whose behavioural manifestations may surface only at the discourse level (Han, 2006). It follows, then, that fossilization is particularly apt to arise from that part of interlanguage competence relating to knowledge of distributional properties of soft features that are regulated by discourse-pragmatic factors. Often, on these features, the near-native speaker displays native-like syntactic knowledge yet imperfect knowledge of discourse-pragmatic constraints, hence asymmetric (selective) competence. However, theoretical speculations are likely to continue on whether the observed persistent non-target-like behaviours are reflections of a problem with representation or processing for years to come.
Leaving aside the vexed issue of representation and processing, in the next section I will first recapitulate the hypothesis on selective fossilization that I put forth based on my analysis of some of the UG-L2 findings, and then suggest a programme of research.

### 7.4 An Analytical Model

Based on systematic findings from the UG-L2 research, I have hypothesized that L1 markedness and L2 input robustness may be combined in different ways, creating zones of fossilization and acquisition respectively (see IV vs. II in Figure 7.4) as well as zones where either may occur (see I and III in Figure 7.4). Under this hypothesis, L1 markedness is conceived of as a composite of two sub-variables, frequency and variability. The former simply refers to the number of times the particular form appears or is used in the L1, hence a surface, and relatively static, attribute, while the latter refers to the number of variants with which the form may be associated, which I argue, can be linked to its distributional patterns in discourse, hence a deeper attribute. An example of the latter is determiners in English whose use is largely determined by discourse and pragmatic considerations. Similarly, the L2 input robustness variable comprises two dimensions, frequency and variability. It must be emphasized, however, that both dimensions here are different from their counterparts for L1 markedness: they are meant to capture the dynamic as well as relative nature of a given form in L2 input, since, often, a static attribute of the L2 may not manifest itself in the input to which a given L2 learner is exposed. As such, the L2 input robustness variable as a whole is also different from L2 robustness, the latter speaking only to static characteristics of the TL. Put simply, the frequency and variability dimensions of L2 input robustness apply to what the learner experiences rather than what is in the TL generically.

Fossilization is known to be an idiosyncratic phenomenon (Han, 2004; Selinker, 1992), which means that it affects individuals differently. As Lardiere (2007: 211) states, ‘After all, different constructions, areas, and sub-areas of an L2 grammar may fossilize in different ways for different learners who . . . have very different initial-state conditions and learning situations’. In the present hypothesis, individual differences are taken account of in two ways. First, through the L2 input robustness variable. Simply, input can be different for individuals in both quantity and quality. This variable input produces different learning conditions for individual learners, in and of itself, as well as in interaction with L1 markedness. Second, Zones I and III (see Figure 7.4) are hypothesized to be ‘grey areas’. Features that fall into these areas can or cannot be fully acquired, depending on the nature of interaction between the two major variables (L1 markedness and L2 input robustness) and individuals’ abilities such as sensitivity to input (Han, 2003; Lardiere, 2007; Long, 2003; Schnitzer, 1993).

A strength of this hypothesis is that it provides a principled perspective on how linguistic features to be acquired may differ from one another within the same, and/or across different, domains and subsystems. This may, in turn, enable gradient judgements to be made on the fossilizability of features falling in Zone IV, and by
the same token, acquisition potential in Zone II. An intended benefit of the hypothesis is that it would allow predictions to be made on (i) which interlanguage elements are prone to fossilization, and (ii) which ones have greater susceptibility to it, the questions key to an understanding of selective fossilization. Moreover, it is hopeful that predictions can be made both prior to learning via analysis of the input and the L1 (assuming both are known a priori) and during learning by examining incidence of ‘premature stabilization’ in the interlanguage (Long, 2003).

Evidently, before any such predictions can be made, the hypothesis itself must be substantiated. To that end and first of all, the four sub-variables within L1 markedness and L2 input robustness must be subjected to rigorous investigation, separately and in combination, in isolation and in context. Both conceptual and empirical work is needed: conceptually, what each of these variables means, what it entails, what contributions it makes to acquisition, and how it relates to the other variables would have to be spelled out; empirically, the weight that each of the sub-variables carries in L2 acquisition would need to be figured out, in a numerical sense. In other words, benchmark values must be set up, against which the real values could then be assigned, assessed and compared. It is highly unlikely that there is only one set value for all the variables; rather, each variable may have one of its own.

Corpus analysis is critical to obtaining these values. Consider, as an example, English determiners and plural morphology for L1-Turkish speakers. Previous research has established both features to be challenging for this population (White, 2003b). Through corpus analysis of the input that the learner experiences, one should be able to tell whether the input is more or less robust vis-à-vis the two linguistic features. Then, a similar analysis can be carried out on the learner’s L1, Turkish, to establish the markedness of these features. Next, the results can be plotted on a graph similar to that shown in Figure 7.4 to locate the zone area for each feature. Predictions can subsequently be made on its fossilization potential.

The approach illustrated above, however, would be the conventional way of testing a hypothesis, and this is how SLA research has largely been conducted to date. An unconventional approach, which is what I will suggest below, would move the fossilization research in a more scientific direction. This approach would adopt a problem-solving strategy typically employed in physics research whereby ‘boundary conditions’ are identified and used as a basis for setting parameters in order to produce a numerical model. This procedure would translate into the following for the research concerned here. First, the Selective Fossilization Hypothesis holds two parameters (in the sense of dimensions) accountable, L1 markedness and L2 input robustness, and can be most simply described in formula (1):

$$P_{foss} = \alpha M_{L1} - \beta R_{L2}$$  

where $\alpha > 0$ and $\beta > 0$, and where $P_{foss}$ stands for the potential for fossilization, $M_{L1}$ for L1 markedness, $R_{L2}$ for L2 input robustness, and $\alpha$ and $\beta$ for the weight each parameter carries. Notice that this formula assumes that $M_{L1}$ (i.e., L1 markedness) positively contributes to fossilization and $R_{L2}$ (i.e., L2 input robustness) negatively. In other words, the more unmarked the L1 form, the greater contribution it makes
to fossilization of the interlanguage form. Conversely, the less robust the L2 input is, the more it contributes to fossilization. The empirical instances of fossilization discussed in the previous sections may serve as ‘boundary conditions’ from which numerical values can be tentatively set for $P_{m}$, $M_{ij}$ and $R_{ij}$ in order to derive the weight of $\alpha$ and $\beta$. Once $\alpha$ and $\beta$ are set, formula (1) can then be run on new data to be further tuned, and so on.

Formula (1), however, cannot operate on its own, because it is, in turn, dependent on formulas (2) and (3), as $M_{ij}$ and $R_{ij}$ are each composed of two parameters. First, I hypothesize that

$$M_{ij} = \gamma F + \delta (1/V)$$

(2)

where $\gamma > 0$ and $\delta > 0$, and where $M_{ij}$ stands for L1 markedness, $F$ for frequency, $V$ for variability, and $\gamma$ and $\delta$ for their respective weights. As expressed in (2), $M_{ij}$ is proportional to $F$ and inversely proportional to $V$. Similarly, a starting point for deriving numerical values for $\gamma$ and $\delta$ is through identifying ‘boundary conditions’, viz. prototypical, marked and unmarked instances. Second, I propose that

$$R_{ij} = \kappa F + \lambda (1/V)$$

(3)

where $\kappa > 0$ and $\lambda > 0$, and where $R_{ij}$ stands for L2 input robustness, $F$ for frequency, $V$ for variability, $\kappa$ and $\lambda$ for their respective weights. As expressed in (3), $R_{ij}$ is proportional to $F$ and inversely proportional to $V$. Numerical values for $\kappa$ and $\lambda$ can be obtained through inputting values deduced from ‘boundary conditions’, that is to say, prototypical instances of robust or non-robust input.

### 7.5 Conclusion

It goes without saying that, in its present formulation, the numerical model proposed above is nothing but the crudest approximation to a most complex learnability puzzle. As work on identifying boundary conditions gets underway and substantiated, the formulas will, however, receive adjustments, resulting, potentially, in more complex equations. For example, it may be that the relationship, as expressed in (1), between input characteristics and probability of fossilization turns out to be non-linear and, therefore, that some of the variables need to be raised to some power or expressed as having logarithmic functions. Similarly, the inverse linear relationship as hypothesized in (2) and (3) may require revision. Nonetheless, the model presented here is a necessary first step, as is true for any scientific inquiry into a complex yet much unknown phenomenon, to serve as a springboard.

Clearly, the amount of work that ensues from any pursuit of the numerical model cannot be estimated. Among other things, large amounts of corpus analysis will have to be undertaken, and a sufficient number of ‘boundary conditions’ identified from extant SLA research, particularly, studies on fossilization. Yet, such an undertaking seems crucial for moving fossilization research beyond its hitherto...
primarily argumentative basis, which, by far, has only led to a probabilistic, if not fuzzy, understanding of the phenomenon, and towards employing scientific means to achieve a more tangible and precise understanding.

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References


