**Deductive Versus Inductive Teaching in Second Language Education**

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**Introduction**

Deduction is logical reasoning that moves from the general and theoretical to the particular and concrete. Deductive reasoning usually follows the pattern: if A = B and B = C, then A = C. The most famous example is the syllogism from Aristotle’s *Prior Analytics*: All men are mortal; Socrates is a man; therefore, Socrates is mortal. Induction is logical reasoning that moves from the particular and concrete to the general and theoretical. This is the form of logic upon scientific methods are based: observational data is used to construct contingent conclusions and theories subject to refinement or falsification.

As Ur (1991) notes, the relationship between deductive and inductive approaches to instruction has long been a controversial topic in Second Language Education (SLE). Inductive teaching in our field consists of providing learners with exemplars of the target language and facilitating their self-discovery of the rules that govern structure and grammar. Deductive teaching starts with these rules and expects learner to absorb them though subsequent engagement and practice.

DeKeyser (2011) points out that the extensive research literature in this area draws heavily on frameworks developed within cognitive psychology and mainstream general education. Claims and counter-claims within the SLE literature revolve around the relationship these forms of instruction have to the implicit and explicit classroom treatment of grammar and the role they play in enhancing the development of pragmatics and communicative competence.

In this chapter, I frame this issue by first outlining the connections between inductive and deductive approaches and the notions of implicit and explicit grammar instruction. I then briefly sketch how these concepts have been utilized in general education. This is done in the interests of showing what we can learn from how this issue influences thinking in other fields in education. I then sketch some of the history of how this issue has been dealt with in SLE in order to show that current debates are nothing new. I ascribe to the truth of the adage that one must learn from history in order to avoid repeating it. This is followed by a discussion of key theoretical and research considerations and findings that affect how concrete inductive and deductive instructional choices are conceptualized in SLE.

**Connections to Implicit and Explicit Instruction**

It is important to note that deductive approaches are necessarily explicit. Explicit instruction occurs when “information about a language is given to the learners directly by the teacher or textbook” (Richards and Schmidt, 2002, p.193). However, inductive approaches are not necessarily implicit. Implicit learning occurs when “students are not aware of what is being taught and learned at the same time” (Richards and Schmidt, 2002, p.250) and the teacher may expect the learner to absorb the grammar embedded within communicative activities directly into unconscious automatic processing. However, inductive and implicit instruction may lead to an explicit understanding of language structures in ways that may or may not be facilitated by the instructor.

In most general educational institutions in the West, teachers utilize a mixture of deductive and inductive approaches (Ma, 2014). The trend, however, is that deductive instruction and transmission models of knowledge have largely given way to inductive instruction and constructionist models. Teacher help students discover and critically examine previously held knowledge so that they can construct new forms in light of their own experiences and the surrounding social context. Similarly, most SLE teachers use a mixture of inductive and deductive techniques (Dörnyei, 2009), depending on the purposes of instruction, the time available and the characteristics of the learners involved.

**The Larger Context: Approaches in General Education**

Inductive learning is a relatively new development in general education and is closely related to implicitly based models of knowledge. As first defined by Reber (1967), implicit knowledge is that which is gained without conscious intent.

In general education, deductive instruction is based on transmission models of knowledge in which students learn knowledge transmitted to them at a didactic and explicitly cognitive level from the teacher. The role of students in these models is to memorize or understand factual knowledge that is deemed to have high value. Students do not manipulate or construct knowledge in these models. Instead, they are meant to accept such knowledge as factual and unproblematic.

Most theorists and researchers in general education have promoted inductive instructional strategies that are based on constructionist models of knowledge. Teachers are encouraged to facilitate critical independent study, reflection and the consideration of alternatives.

Constructionist models of learning were first and most famously promoted within education by John Dewey, who emphasized how students profitably engage knowledge in the context of practical experience. Similarly, Piaget emphasized how learners build knowledge in successive phases that are based on the testing of what works for them in real-world situations. Later theorists, such as Bruner and Vygotsky, have emphasized how teachers should design curricula and pedagogical activities as the means towards constructing knowledge in terms of socially bound problem solving.

**Historical Approaches in Second Language Education**

In SLE, deductive teaching occurs when learners are explicitly taught rules before being given opportunities to use the target language. Inductive teaching occurs when learners are not taught structure directly, but left to discover rules from exposure and practice with the target. The former is a hallmark of the Grammar Translation Method. The latter is a hallmark of the Direct, Audio-lingual and Communicative Approaches (Howatt, 1984).

 As I outline below, theorists and practitioners in the field of second language teaching have struggled over the relative merits of deductive and inductive approaches. Deductive approaches have had a long history of dominance within the field, with a history stretching back in the West as far back as the Greeks (Nassaji & Fotos, 2011). The Grammar Translation Method, which dominated the field in the 1800’s (Howatt, 1984), emphasized deductive methods, which exponents characterized as being a process of explaining a rule and then applying it to the interpretation of texts.

Howatt (1984) notes that the first prominent practitioner in English who incorporated what would become known as an inductive approach was Holyband in the 1500’s. Much as would the Direct and Audio-lingual methods in the twentieth century, Holyband advocated the primacy of oral proficiency and discounted the importance of developing grammatical accuracy through the examination of written texts. His position was controversial even then.

As Howatt (1984) outlines, the language teaching reform movement of the late 1800’s rejected deductive principles tied to the Grammar Translation Method and championed inductive approaches, in which the learner discovered grammatical rules through examinations of various texts and oral usage. Some reformers, such as Klinghardt, advocated modifying or constructing examples of speech or text geared towards highlighting particular grammatical forms. Others, such as Sweet (the model G.B. Shaw used in large part for the Dr. Higgins character in *Pygmalion*), argued for the use of transcriptions of authentic speech and texts for this purpose.

Deductive methods were not totally rejected by late 19th century reformers, however (Howatt, 1984). In fact, the largest association within the field at the time, the International Phonetic Association, recommended within its published set of teaching principles that inductive methods be used at the beginning and deductive methods at the more advanced levels of second language instruction.

The new emphasis on inductive approaches continued into the next century with the advent of the Direct Method (a.k.a. the Natural Method), which quickly became a dominant form of second language teaching in most western countries after the adoption of its central principles by such major language teaching firms as Berlitz. The Direct Method emphasized vocabulary and the primacy of oral communication (especially in terms of question and answer turn taking) and the presentation of material focused on particular grammatical structures. Learners were expected to impute grammatical rules based on this material (Howatt, 1984).

In more recent times, deductive approaches have been featured prominently in Audio-lingual and Communicative approaches (Howatt, 1984). Like the Direct Method, the Audio-lingual approach stresses oral communication and deemphasized explicit grammar instruction (Freeman & Anderson, 2011). However, instead of vocabulary, the Audio-lingual approach focuses on syntactical structures. In terms of technique, this approach focused almost exclusively on drills and pattern recognition exercises that are organized according to particular grammatical structures. The Communicative Approach, which is the most commonly accepted methodology at the present time (Dornyei, 2007) owes much to the adoption of Chomsky’s notion that language behaviour is based on purpose and the rejection of the behaviourist assumptions that lay at the heart of Audio-lingual approaches. This approach emphasizes the communicative aspect of teaching language, concentrating on function rather than form and is meant to use various techniques that create realistic contexts for language acquisition (Richards & Renandya, 2002).

**Key Theories and Research in Modern SLE**

As noted above, theories and research in modern SLE that revolve around inductive and deductive learning make claims and counter claims in regards to the connections (or lack) between explicit and implicit treatment of grammar. Some theorists have argued that there is a connection between explicit and implicit learning of grammar, to a lesser or greater degree. Others have argued that there is little or no connection.

In one of the earliest of modern treatments of this issue, Carroll (1958) made clear distinctions between various inductive and deductive abilities. One of these, in fact, was coined *inductive language analytic ability.* It described “the ability to examine a corpus of language material and from this notice and identify patterns of correspondence and relationships involving either meaning or syntactical form” (as cited in Skehen, 1998, p.201). For Carroll, this ability was distinct from g*rammatical sensitivity*, which is the ability to discern the function of grammatical structures in sentences; *phonetic ability*, which is the ability to identity distinct sounds; and *role learning*, which is the ability to efficiently discern the associations between sounds and meanings. Carroll built these distinctions into the highly influential Modern Language Aptitude Test (MLAT) that he co-wrote with Stanley Sapon in 1958.

 Some theorists, most notably those who practice Audio-lingual approaches, have argued that practice turns explicit knowledge of the language directly into implicit knowledge (e.g. McLaughlin, 1978). Adherents to this position, which Ellis (1985) later called the *strong interface position,* believe that teaching involves supplying the learner with opportunities to produce targeted structures so as to increase implicit knowledge and automatic processing.

In his seminal survey of the field, Stern (1983) explicitly states a preference for inculcating inductive abilities, basing his argument on notions from cognitive psychology to the effect that this approach encourages autonomy and engages the learner in subject matter that is more pertinent to them personally. However, Stern notes that it might be unrealistic to expect learners to do completely without some deductive teaching. He cites Berman (1979) to the effect that there must be a continuous, nonlinear and flexible interplay between observation of examples, communicative practice and the explication of rules.

While some of theorists have argued for a necessary connection between induction and deduction, or the value in choosing one approach over the other, several notable theorists and researchers have completely rejected the saliency of any connection whatsoever. This position, which Ellis later termed the *non-interface* position, was most famously taken up by Krashen (1982), who argued that *acquisition* and *learning* are two completely independent systems involved in second language acquisition. *Acquisition* results from unconscious processes that are similar to those that children undergo in the acquisition of a first language. These processes involve meaningful and natural interaction using the second language that focus on form rather than structure. *Learning* is a conscious process of learning structural forms of the target language. *Acquisition* amounts to the ability to automatically process and effectively use the target language. *Learning* amounts to the relatively unimportant ability to describe the language in terms of grammatical rules. He noted the commonplace observation that many second language learners can declaim grammatical rules at great length while having very little practical or demonstrative communicative ability with the target. Likewise, he noted that most (so-called) native speakers have little understanding of grammar description. Krashen’s arguments have been highly influential, particularly in terms of his connected hypotheses regarding comprehensive input, affective filters, language monitor and the order of acquisition.

As Richards (1999) notes, Krashen’s arguments coincided with the advent of a dogmatic interpretation of communicative language teaching, a questioning of deductive methods and the rejection of the explicit treatment of grammar. In some quarters, (as I remember from my own training as a second language teacher) grammar instruction was treated as anathema.

However Krashen’s arguments were quickly and widely criticized in the field, especially in terms of his somewhat strictly maintained contention that *learning* and *acquisition* are two systems completely independent of one another. Rod Ellis (1997) provides a good summary of these criticisms. He noted that some researchers argue that explicit grammar instruction can be converted to automatic processing and implicit knowledge of the target language. This position Ellis described as the *Interface Hypothesis*. Other researchers argued that grammar instruction facilitates automatic processing and the implicit acquisition of the target language by providing the learner with a consciousness of the overall structure of the language that can be used when the learner is ready to acquire such features. This position Ellis called the *Delayed-Effect Hypothesis*.

Unfortunately, as Ellis pointed out in 1997, the empirical research in this area at the time of his writing was inconclusive. Whether the research had focused on the rate or route of acquisition, most research findings (as he carefully documented at the time) contracted each other in terms of evaluating the value of inductive and deductive approaches. Many of these studies featured inconsistent methodologies, small sample sizes or failed to observe actual classroom behavior. In addition, most of the empirical research in this area did not take into account non-instructional factors that might affect acquisition, such as motivation or individual learner characteristics.

As a result of this survey of the available research at the time, Ellis (1985) formulated what he called the *weak interface position.* This position argued that was indeed a connection between deductive and inductive learning of second languages, but that this connection was complex and dependent on context. He recommended that explicit instruction be viewed as a process of *consciousness-raising* in which the explicit and deductive treatment of grammar be used to alert learners to the structural content embedded within communicative activities. A cognitive or metalinguistic understanding of target language structures helps enhance learning by giving learners opportunities to concretely *notice* grammatical structures within the *input* provided by the teacher and *noticing the gap* between this *input* and their own *output*.

Ellis (1985) argued that this position helped combine structured syllabi with those that are functional or task based. He further argued that two types of consciousness-raising activities exist. One is for comprehension and is aimed at enhancing *intake* (the recognition and understanding of features of the input). The other is for the purposes of building explicit metalinguistic understanding of the target language. He did have a number of caveats, however. He noted that deductive instruction is most appropriate at higher levels of second language grammatical ability in which accuracy is of prime importance. He also noted that deductive instruction should not be directed at a feature that learners are not yet ready or do not have the ability to acquire implicitly. In sum, Ellis argued that explicit knowledge is converted into implicit knowledge only under particular circumstances related stages of second language acquisition.

In a comprehensive review of the literature, Long (1988) developed the pedagogical approach to language teaching that he termed *Focus on Form*. He argued that there was a clear lack of support in the literature for what he termed *focus on forms* (exclusive focus on the explicit and deductive treatment of grammatical structures) and a strong support for teacher facilitated learning. Long found that, in particular, learners needed to have instructional supported learning opportunities if they were to achieve native-like fluency and accuracy.

The *Focus on Form Approach* is based on the belief that classroom treatment should feature a mixture of inductive and inductive approaches to the treatment of grammar that is either explicit or implicit, depending on the type of structure to be mastered and the characteristics of the learners in question. It combines methodology based on fluency goals (functional communication) and those based on accuracy (structure). As Nassaji and Fotos (2011) put it, “a focus on form means that grammatical concepts may be taught, but… within a framework of communicative aims” (p.13).

 Grammar is first covered explicitly by the teacher in such a way as to raise the consciousness of the learner. In other words, the teacher does what is common in all education: makes sure that the learner is alerted to what the subsequent lesson is focused upon. This is followed by communicative practice interspersed with activities that facilitate the learner *noticing the gap* between his or her own production and the model of the target language provided by the instructor. This latter measure echoes Swain and Lapkin’s (1995) argument that *output* is essential to the second language learning process because learners must be able to compare their output with a model of the target language. In this way, the Focus on Form approach follows the sequence necessary for successful intake outlined above by Richards (1999)

The Focus on Form approach does argue that there are reasons for teaching explicit grammar for its own sake. Drawing on previous research, Ellis, Loewen, and Erlam (2006) argue that learners should be alerted to the relative difficulty or usefulness of various grammatical structures (see Widdowson, 1979) and how common a feature is (what Roman Jakobson termed its *markedness*). As Richards & Schmidt (1983) argued, the first step students take in learning grammatical features of a language is to *notice* them. Ultimately, conscious reflection on the nature of language in general (what Courtney Cazden termed *metalinguistics*) greatly enhances one’s ability to learn a second language in particular.

There has been a recent explosion in research that examines the Focus on Form Approach. A partial and cursory examination of this research in English this past year shows that the approach has value in terms of: explicitly-based corrective feedback (Spada, 2014; Samburskiy & Quah, 2014), the writing performance of high proficiency learners (Salimi, Bonyadi & Asghari, 2014; Shintani, Ellis & Suzuki, 2014), the acquisition of grammatical gender in elementary classrooms (Lyster, 2014), the ability of EFL learners to produce appropriate English language conventional expressions (Rafieyan, Sharafi-Nejad & Eng, 2014), the lexical categories used by Japanese speakers on Skype (Akiyama, 2014), the enhancement of language acquisition by introverts at the high intermediate level (Kim, 2014), the acquisition of plural –s by beginning level Japanese children (Shintani, 2014), and the combination of systematic explicit grammar instruction with task-based language teaching in a Chinese EFL context (Zang & Li, 2014).

This recent research bears out the earlier contentions made in the research literature (Bitan & Karni, 2004; Nassaji & Fotos (2004) that deductive teaching followed by practice for the purposes of automatic processing can outperform implicit teaching that is divorced from an explicit treatment of grammar.

**Conclusion: Pedagogical Implications**

Stern (1983) noted that there have been few attempts historically to systematically analyze the vast diversity of L2 teaching methods. One of the first of these was conducted by Bosco and Di Pietro (1970), who outlined what they termed the *nomothetic* and *non-nomothetic* dimensions of language teaching. The former roughly corresponds to the explicit instruction and the latter to implicit treatment of grammar. In their view, teachers had to choose one or the other orientation towards grammar instruction.

However, as Larsen-Freeman (1991) points out, teachers have many concrete and practical choices in regards to deductive and inductive pedagogy. The teacher might, for example, present concrete pedagogical tasks without any reference to structure and expect the learners to discover how the structure works inductively. However, the teacher could direct much of this discovery process by providing the learners with aspects of grammatical rules at various points in the lesson. The teacher might, for example, provide instances of two separate but connected grammatical items and ask the learners to identify the differences between them. These examples show that teachers can approach instruction inductively, deductively, or as a mixture of the two. The trick, of course, is to know when an inductive approach is appropriate, when a deductive approach is appropriate and when one can provide a mixture of the two for the benefit of our learners (Nassaji & Cumming, 2000).

Richards (1999) argues that the acquisition of a second language depends on a sequence that differentiates between input (the exposure a learner has to that which is to be mastered) and intake (the actual mastery of the item in question). This sequence depends on a mixture of inductive and deductive activities. In his view, in order to be effective, input must be comprehensible and the learner focused. Thus, the input must be simplified, exposed to the learner frequently and explicitly presented by a teacher in such a way as to encourage a consciousness of the form under study. This is followed by inductively focused learner practice. Intake depends on the appropriate level of difficulty of the grammar item, its saliency for the learner, the frequency with which the item is encountered and the immediate need the learner has to master the structure in question. These principles echo Pienemann’s (1998) distinction between *input for production* and *input for comprehension*, and his argument that learners will restructure *interlanguage* in terms of what is comprehensible to them given their particular stages of development. Decisions as to the appropriateness of inductive and deductive approaches should be made in the context of how this sequence of acquisition can be enhanced.

Depending on your point of view, the Focus on Form Approach is either an extension of the Communicative Approach, or a completely new development within the field. Certainly, there are many interpretations of the communicative approach (Dornyei, 2007). As I alluded to above, my own teacher training was in the heyday of what might be called the dogmatic period of the Communicative Approach. My teacher trainers treated grammar as an abhorrence to be avoided at all costs. I was told to treat grammar, if at all, at the end of one’s lesson almost as an afterthought. I quickly learned at the beginning of my 20-year practice in adult continuing education, that learners wanted (in fact needed) grammar as a means by which to organize their second language acquisition. Communicative practice clearly had to be the center of my teaching practice, but a wholesale rejection of explicit and deductive methods was clearly counterproductive.

My experiences (which were far from unique) demonstrate the truths behind Knowles (1984) notion of *andragogy*. Adult learners demand an immediate and concrete applicability of instruction that is clearly linked to their previous schooling. They require an explicit mapping out of the knowledge they wish to acquire in terms of the knowledge they have already mastered. In second language education, an explicit instruction in structure and grammar provide this for them.

As the account Larsen-Freeman (1991) provides above demonstrates, a teacher is free to choose either an inductive or deductive approach for the classroom. Communicative practice meant to inculcate automatic processing of the target language.is still primary. However, in whatever approach taken, adult learners should be exposed to explicit coverage of structure and grammar that augments these communicative activities.