2 Form-focused instruction and the development of L2 proficiency

2.1 Introduction

The goal of this chapter is to evaluate the importance of explicit knowledge in relation to second language proficiency. It should be pointed out that this is an issue of considerable controversy in two ways. One point of controversy is the role of explicit knowledge in communication. Although most researchers agree that spontaneous and undeliberate language use is based in implicit knowledge, some argue that highly planned instances of language use are in fact based on explicit knowledge rather than implicit knowledge. Sharwood Smith provides some examples of language use driven by explicit knowledge: preparing a question, a speech or a telephone conversation (1988). The second point of controversy concerns the development of L2 proficiency: does knowledge about the second language in some way provide scaffolds for L2 proficiency? Is it the starting point or the catalyst of second language acquisition? This study addresses this latter point: whether explicit knowledge promotes the development of implicit knowledge.

The three sections that this chapter consists of all deal with this issue from very different angles. Section 2.2 discusses the interface debate, as this debate focuses on the organisation of linguistic knowledge; and as such, on the role of explicit knowledge in L2 acquisition. The purpose of this section is to describe (rather than critically discuss) the potential relationships between explicit and implicit knowledge, and how this relationship affects FFI. Section 2.3 and 2.4 both provide critical evaluations of the interface debate. In 2.3, the interface debate is considered in the light of recent developments in SLA theory. In doing so, different strands of SLA theory are brought together with a heavy focus on precisely defining implicit and explicit linguistic knowledge. Second language acquisition is considered in the light of the nature and representation of linguistic knowledge; how linguistic knowledge is put to use in communication; and what drives the acquisition of linguistic knowledge. Section 2.4 takes the insights provided by 2.2 and 2.3 as a starting point, and evaluates to what extent FFI
research has provided definite answers to the contribution that explicit knowledge makes to the development of second language proficiency. Section 2.5 summarizes this chapter, and identifies issues in need of further study.

2.2 The interface debate

2.2.1 Introduction

As pointed out in the introduction (Chapter 1), the potential power of form-focused instruction can be discussed in terms of possible interfaces between explicit and implicit knowledge. The interface debate discusses the role that explicit knowledge plays in the acquisition of implicit knowledge. Three positions can be distinguished: the no interface position, the strong interface position and the weak interface position. Each of these positions claims a different role for explicit knowledge in the course of acquiring implicit knowledge, and consequently, each provides an alternative answer as to how form should be taught. As this study hopes to contribute to the interface debate, this discussion will be outlined in the present section. It is important to stress, though, that a sketchy overview of the debate is provided, discussing only the main proponents of each position. The purpose of this section is simply to identify the positions: what role they attribute to explicit knowledge, and what predictions they make concerning how and when grammar teaching is most effective in improving second language proficiency (2.2.2). In addition, a number of issues are highlighted that are related to the interface debate and that are important to the development and instruction of L2 proficiency. First, developmental readiness, the notion that FFI can only be successful when the language learner is in a particular stage of development is addressed in 2.2.3. In addition, the interface debate is related to differences between grammar structures (2.2.4), and to personal factors (2.2.5). In doing so, this section tries to reveal the central questions and concerns of the interface debate, and it will provide the framework of discussion for the following sections.
2.2.2 Three interface positions

The no interface position

The no interface position posits that the explicit and implicit knowledge systems are completely separate from each other, and it is strongly associated with Krashen and his theory of second language acquisition (1981; 1985; 1994; Krashen & Terrell, 1983). Krashen proposed the distinction between acquisition and learning. Acquisition is a subconscious process that leads to acquired knowledge (implicit knowledge), whereas learning requires conscious effort on behalf of the learner, resulting in 'learned' knowledge (explicit knowledge). In other words, Krashen claims that aspects of language can be internalized in two fundamentally different ways, resulting in two fundamentally different knowledge bases. Most important to the discussion here is Krashen's claim that explicit knowledge resulting from learning plays only a very limited role in the development of second language proficiency.

For Krashen, second language acquisition is an unstoppable and inescapable process that will occur as soon as L2 learners try to understand messages in the second language. He sees second language acquisition as very similar to the way children develop their L1: it too is driven by an innate Language Acquisition Device (LAD) as proposed by Chomsky (1965), and there is a natural order in which the rules of language are internalized. However, successful second language acquisition requires that certain conditions be met. First, the input has to be comprehensible, and it has to suit to the learner's stage of development. Therefore, if a learner is at stage "i", comprehensible input with "i+1" qualities will lead to acquisition. The second requirement has to do with the language learner. Krashen refers to an 'affective filter' which when up would prevent acquisition to occur, because the input does not reach the LAD. Whether the filter is up or down depends on affective factors such as motivation, anxiety, self-confidence, etc. Krashen summarizes his theory in one single claim which he refers to as the fundamental principle in second language acquisition: "people acquire second languages only if they obtain comprehensible input and if their affective filters are low enough to allow the input 'in.'" (1985: p. 4). Comprehensible input, then, is the only way to second language proficiency. "All other factors thought to encourage or cause second language acquisition work only when they contribute to comprehensible input and/or a low affective filter." (1985: p. 4).

Krashen does acknowledge that the kind of knowledge accrued via learning may be advantageous. First and foremost, he attributes a very limited role to
explicit knowledge in students’ production. It may serve as a monitor to edit speech or writing online, but only if the second language user is “consciously concerned about correctness; and he or she must know the rule.” (1985: p. 2). Also, it remains to be seen whether students are able to use the explicit knowledge appropriately. Second, having explicit knowledge might be advantageous if it could somehow support or aid the acquisition process. Krashen does indeed acknowledge that there may be an indirect contribution of learned knowledge to second language acquisition (1985). One possibility is that teaching grammar may lower students’ affective filters; for instance, because it satisfies certain students’ desires to know about the structure of the language they are learning, or because it positively influences their self-confidence. A third way in which teaching grammar may be helpful is that it in fact helps to make the input comprehensible, and in this way stimulates the acquisition process. If a learned rule is encountered in text, it may be more comprehensible to a student and thus increase the possibility of acquisition of other rules. Finally, Krashen allows for the possibility that the students’ own output may serve as comprehensible input. Thus, if a student can be induced to use a learned structure (at i+1) productively, acquisition may occur on the basis of his or her own input. Although explicit knowledge may help, Krashen sticks to his claim that conscious learning contributes little to second language proficiency, and that acquisition can take place without error correction, skill-building or output, but not without comprehensible input (1994).

Krashen’s downplay of the role of explicit knowledge in second language acquisition has impacted significantly on pedagogy. It led many teachers to change traditional rule-oriented language education to communication-oriented education. The title of Krashen and Terrell’s book, The Natural Approach (1983), conveys Krashen’s recommendations for pedagogy clearly. Krashen and Terrell underscore the importance of receptive types of learning. However, although natural language is the most important ingredient in his view, they do not merely advocate for students to engage in conversation. Free conversation would not constitute optimal input, because the students may not understand what is being said. Krashen, then, acknowledges that second language acquisition in formal contexts (i.e. the classroom) is more efficient than in informal contexts (1981). He feels that it requires professionals to design classroom activities that provide students with comprehensible and catching input, and that allow for or stimulate real communication.
The strong interface position

The strong interface position has its roots in cognitive psychology. This position entails a strong relation between explicit and implicit knowledge: they are typically seen as the extremes of one continuum. This means that nature of linguistic knowledge changes in the course of acquisition in such a way that it becomes increasingly more available in communicative settings. One can distinguish two variants of the strong interface position, which seem to be in complete opposition. On the one hand, Bialystok (1989; 1994a; 1994b) argues that linguistic knowledge starts out as implicit and becomes more explicit as the language learner becomes more proficient. On the other hand, researchers such as, O’Malley, Chamot, and Walker (1987), Sharwood-Smith (1988), and DeKeyser (1998) argue that the development of second language proficiency is a process of automatizing explicit knowledge so that it becomes implicit. Both views will shortly be discussed.

Most striking about Bialystok’s theory of second language acquisition is that she argues that L2 proficiency develops along two dimensions: analysis and control. Analysis refers to “awareness of structure”, and it is "represented as a proposition in which the formal structure and the relationship to meaning are apparent” (1989: p. 33). Based on the assumption that language is a structured knowledge system, Bialystok argues that one of the main goals of L2 learners is to develop awareness of the structure of language. As long as a particular linguistic structure is unanalysed, it functions as a pattern or routine. But as the learner develops awareness for that structure, it becomes available for use in new contexts. In other words, as a particular piece of linguistic knowledge moves along the analysis dimension, the knowledge itself remains inherently the same, but it gradually becomes available in functionally more creative contexts (1989). Bialystok’s control dimension refers to the ability to access linguistic information (1989), or the degree of automatization. Second language learners may differ in their ability to access a particular linguistic structure, irrespective of its degree of analysis. Control, then, accounts for differences in fluency between L2 learners.

With reference to the interface hypothesis, it is important to point out that for Bialystok, explicit analysed knowledge evolves from implicit unanalysed knowledge (1994; 1994b). Therefore, all linguistic knowledge necessarily starts out as being implicit and nonautomatic. This means that explicit knowledge does not exist independently: it exists by virtue of implicit knowledge. Bialystok herself uses the

terms *implicit* and *explicit knowledge* to refer to *unanalysed* and *analysed* knowledge, respectively. However, knowledge being explicit does not mean that it is conscious knowledge; rather, it can be brought to consciousness if called upon. Bialystok’s idea of how a second language is learned, then, is perhaps best illustrated by the following quote: “Indeed, increasing explicitness can almost serve as a definition for what we mean by ‘learning’” (1994b: p. 567).

For most proponents of the strong interface hypothesis, learning is better characterized as increasing implicitness. DeKeyser’s (1998) account of second language acquisition, for example, which is based on Anderson’s ACT model of skill acquisition (1995), proposes that linguistic knowledge typically moves through three developmental stages. It starts out as declarative (factual) then becomes procedural (knowing how), and eventually will become fully automatized. And once the learner reaches the final stages, the declarative knowledge that formed the basis of learning may actually be lost. How does factual knowledge become procedural? The crucial step in this process, according to DeKeyser, is proceduralization: a learner starts to engage “in target behaviour – or procedure – while leaning on declarative crutches” (p. 49). This basically means that the language learner has to start using a particular structure while keeping the declarative knowledge in mind. Repeated practice of this kind will lead to knowledge that is more procedural and that encodes behaviour rather than factual knowledge. The final step from procedural to fully automatized knowledge requires “strengthening, fine-tuning, and automatization...” (p. 49) through practice. Or, in the words of Sharwood Smith (1988: p. 52):

> “Armed with explicit information about particular tasks, the learner can use conscious applications of rules to practice in and out of class and to communicate in the target language at a higher level of proficiency, albeit without the speed and spontaneity associated with the notion of ‘fluency’. Fluency is assumed to come later and as a result of practicing TL structures in formal and informal, naturalistic ways.”

The pedagogical recommendations made by proponents of the strong interface position evolve around the establishment and automatization of L2 knowledge. DeKeyser (1998), for example, recommends that declarative knowledge is established by means of mechanical drills: exercises that focus exclusively on

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2 In the spirit of skill acquisition theory, DeKeyser follows Anderson in using *declarative* and *procedural knowledge* to refer to *explicit* and *implicit knowledge*. In a footnote he points out that – despite slight differences in meaning – the terms are often used interchangeably (1998: p. 48).
linguistic form and do not require the L2 learner to pay attention to meaning. However, the goal of such mechanical drills should be "to develop, test, and refine declarative knowledge, which means that the student should have ample time to think, an should never be rushed or put through activities that are so repetitive as to pre-empt all conscious rule application" (1998: p. 55). Subsequently, DeKeyser proposes 'communicative drills' to bring about proceduralization. Ideal communicative drills in the eyes of DeKeyser are those that require the language learner to convey new information while keeping declarative knowledge in mind. In contrast to Krashen, then, DeKeyser heavily emphasizes careful planning of classroom activities.

The weak interface position

The weak interface position has been put forward by R. Ellis (1990; 1994a; 1997). He, too, argues that implicit and explicit knowledge are two separately coexisting knowledge systems. Ellis’s theory tries to allow for findings that suggest that – for some rules – formal instruction is effective only if properly timed: these rules seem developmentally constrained (for a review, see Ellis, 1990). The weak interface position states that explicit knowledge can become implicit. However, for rules that are developmentally constrained, this can only happen if the instruction is properly timed. Also, explicit knowledge can positively affect implicit learning processes, but in such cases, the effects of instruction will be delayed rather than immediate. Another important feature of Ellis’s theory is that knowledge does not necessarily start out as being explicit. In fact, L2 knowledge mostly starts out as implicit.

For Ellis, acquisition is not so much driven by learners’ needs to understand messages, as Krashen supposes. Rather, he argues that language learners pay attention to features of the input and compare them to their own output: mechanisms referred to by Ellis as noticing and comparing. What attracts the learner’s attention may depend on various things, but not understanding the message may be one of them. Frequency, salience, particular task demands, all these aspects of the input may be noticed and compared. This process may lead the language learner to reconsider particular hypotheses he or she has about the target language, and perhaps lead to new hypotheses. Ellis refers to this latter process as integration. The importance of explicit knowledge may be that it helps the L2 learner to notice a particular rule, especially when it is communicatively redundant. On top of that, it may also help the L2 learner to notice the gap: with
explicit knowledge, it may be easier to see how the input and the L2 learner’s own output differ.

Like Bialystok, Ellis tries to disentangle implicit and explicit knowledge systems and controlled and automatic processing, which he feels have unjustly been conflated in the course of the interface debate. Ellis argues that both implicit and explicit knowledge can be processed in varying degrees of automaticity. Thus, he arrives at four different types of knowledge (summarized in Table 2.1) and he does not exclude the possibility that for a particular structure all four types coexist (Ellis, 1994b):

<table>
<thead>
<tr>
<th>Type of knowledge</th>
<th>Controlled processing</th>
<th>Automatic processing</th>
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<tbody>
<tr>
<td>Explicit</td>
<td>Conscious and intentional use of newly taught rules in grammar exercises.</td>
<td>Conscious and intentional use of an older rule in a variety of tasks.</td>
</tr>
<tr>
<td>Implicit</td>
<td>Deliberate use of rules that were noticed in the input</td>
<td>Intuitive use of rules as in everyday use.</td>
</tr>
</tbody>
</table>

In line with Ellis’s views on the organisation of linguistic knowledge, Ellis’s recommendations for pedagogy involve two pedagogical practices aimed at developing implicit and explicit knowledge (1997). The acquisition of implicit knowledge, he argues, stands to benefit most from interpretation tasks. Such tasks facilitate noticing because understanding the message crucially depends on properly interpreting the meaning expressed by the targeted grammatical structure. Explicit knowledge should be promoted by means of consciousness-raising tasks, which typically aim for discovery of a particular rule, for example, identification tasks. In addition, one of Ellis’s main concerns seems to be timing the instruction properly: when to teach which rule of grammar. As it is virtually impossible to make well-informed decisions (not enough is known about developmental orders), Ellis does not believe in approaches that offer the rules of grammar step by step. Rather, he argues in favour of receptive rather than productive tasks, aiming at comprehension rather than production.

2.2.3 Developmental readiness and natural orders of acquisition

A notion that frequently occurs in the interface debate is the notion of developmental readiness. This notion results from the observation that second
languages develop according to natural orders of acquisition. Most notably associated with the finding of natural orders of acquisition are Pienemann and associates (e.g., Meisel, Clahsen, & Pienemann, 1981; Pienemann, 1988). They reported that fixed stages can be identified in the acquisition of the word order rules of German second language learners. They hypothesized that the acquisition of German word order is subject to psychological constraints which are grounded in UG. These findings of course raise the question of whether and how instruction can impact on this process. In fact, Pienemann himself has reported that instruction is effective only if it matches the stage of development the language learner is in (e.g., 1988). Consequently, timing the instruction of a particular structure may be of crucial importance, which in turn may severely limit the contribution of explicit knowledge to the acquisition process.

However, DeKeyser (1998) downplays the importance of developmental readiness. He takes issue with the methodology of studies that have reported natural orders (often no control group, and improper operationalization of the instruction). But most importantly, he contests their cause: psychological constraints. Goldschneider and DeKeyser (2001) performed a meta-analysis on studies reporting a developmental sequence, trying to identify alternative causes for these sequences. They found that – to a very large extent – developmental sequences can be predicted by five variables: frequency, phonological salience, semantic complexity, morphological regularity, and syntactic category. This finding is difficult to match with the notion of psychological constraints, and alternatively suggests that fixed orders of acquisition are caused by the extent to which structures stand out in the input.

Irrespective of their cause, it is fair to assume that particular features of a second language develop according to what may be called ‘natural orders’. Such orders may limit the potential effectiveness of FFI, in that instruction would only be effective if the L2 learner is sensitive to it, and it suggests that instruction has to be dynamically organised, continuously adapting to the L2 learners’ needs as they move through the orders. All this implies that the success of the FFI crucially depends on knowing when to teach which structure, and in which order. However, little is known yet about what parts of language develop in a fixed order (e.g., DeKeyser, 1998; Ellis, 1997; Lightbown, 1998). But perhaps the scope of FFI is not as limited as the above suggests. First, the effect of instruction may be delayed (Ellis, 1997). The knowledge that results from FFI may not immediately affect acquisition in cases where the L2 learner was not ready, but once the learner does reach the proper stage, the knowledge that was taught previously may facilitate the acquisition process. This is an important observation for
assessing the effect of instructional practices, and most FFI research includes an 
assessment of delayed learning effects for this very reason. Second, if natural 
orders are caused by factors such as frequency and salience, as suggested by 
Goldschneider and DeKeyser’s (2001) study, then instruction may effective if it 
achieves to manipulate the input in such a way that L2 learners can benefit from 
it.

The pedagogical recommendations that have been put forward to deal with 
natural orders are quite diverse. Krashen, for example, does not recommend 
trying too hard to match the language learner’s exact stage of acquisition. The risk 
of missing the proper stage is too large, he feels; as is the individual variation 
within classrooms. Therefore, Krashen recommends that teachers try to make 
themselves understood in a similar way as caretakers do for young children; they 
need to adjust to the speaker’s level of proficiency (Krashen, 1985). However, 
most consider the presence natural orders of acquisition to have severe 
consequences for the effectiveness of instruction. Pienemann obviously argues 
that instruction must match the learner’s stage of development to be effective. 
Similarly, one of Ellis’s main concerns is how to design a structural syllabus, 
which is “a list of grammatical items, usually arranged in the order in which they 
are to be taught” (1997: p. 135). This is obviously difficult on the basis of the 
limited amount of information available about natural orders.

2.2.4 The type of target structure

Another potentially constraining factor for effective FFI is the type of 
grammar structure to be taught. In the light of the interface debate, this implies 
that the practical value of explicit knowledge varies between grammar structures. 
It has proven difficult, though, to pinpoint exactly which features of a rule of 
gramar would cause such differences. First of all, as already explained in the 
previous subsection, the notion of developmental readiness may be involved: Ellis 
(Ellis, 1994a) has claimed that only those structures that are not developmentally 
constrained can be successfully taught. FFI about developmentally constrained 
structures need to match the learner’s stage of acquisition. Similarly, the features 
identified by Goldschneider and DeKeyser (2001) may determine the 
effectiveness of instructional efforts. However, other aspects have been identified 
as possibly interfering with the ‘teachability’ of a particular structure as well, all 
pertaining to the nature of the grammar structures themselves.

Several researchers have hypothesized that the effectiveness of instruction 
depends on differences in structure complexity. In fact, Krashen addresses this
issue, claiming that complex rules can only be learned implicitly (1981). Complexity can be described in terms of formal and functional complexity. DeKeyser (1998) provides definitions: a structure may be formally complex when it requires complex processing operations, and it may be functionally complex when the relation between form and function is opaque. However, DeKeyser also points out that there is little agreement on how this works out in practice. He gives the example of the argument between Krashen and Ellis over the formal complexity of the third person –s, which Krashen deems formally simple, whereas Ellis thinks it complex because it has to agree with the subject (in number). Also concerning functional complexity, DeKeyser argues that the common assumption that third person –s is functionally simple may not hold, because “one morpheme expresses several semantic concepts at the same time (present tense, singular, third person)” (1998: p. 44).

Hulstijn & De Graaff (1994) identify scope and reliability as factors that influence the effectiveness of FFI instruction. These factors relate to whether learning is rule-based or exemplar-based. Scope refers to the absolute number of instances and reliability refers to the percentage of instances for which the rule holds (number of exceptions). They hypothesize that explicit instruction is valuable for rules of large scope and high reliability only. Rules that are unreliable need not be taught because a learner cannot safely apply the rule, and rules that are small in scope do not require FFI because their infrequent occurrence does not justify the effort.

Finally, effectiveness of FFI has been related to L1 – L2 contrasts. Harley (1993), for example, has argued that structures that may be taught effectively are those that differ from the students’ L1 and are not salient. VanPatten (1996) has similarly argued that instruction should inform learners about mismatches between their default processing strategies (often based on their L1) and the strategies needed to successfully process L2 input. It is rather difficult, though, to predict how the L1 may affect L2 acquisition, because of the intricate ways in which grammar structures may interact. Thus, it is dangerous to generalize on the basis of findings for one particular structure and one particular set of languages (Odlin, 2003). Besides, Doughty and Williams (1998) point out that there is little knowledge about what this implies for instruction. Cross-linguistic influence may both undermine and strengthen particular instructional efforts, which makes decisions-making very difficult.

Identifying which characteristics of grammar structures affect their teachability is just the beginning of an explanation. Ultimately, claims regarding differences between grammar structures concerning their teachability need to be
motivated by theories of language acquisition. For now, it will suffice to point out that effects of FFI do not necessarily apply universally to all aspects of grammar. Thus, it is possible that there is an interface between explicit and implicit grammar only for some aspects of grammar.

2.2.5 Individual differences

The possibility that individuals may differ with respect to their ability to use explicit knowledge for acquiring implicit knowledge has not inspired the interface debate very much. Only Krashen addresses the issue explicitly (1981). He relates individual variation in second language performance to differences between learners in the ability to use consciously learned knowledge as a monitor. Krashen describes how some language learners are able to monitor their output effectively and at appropriate moments, whereas other learners tend to overuse or underuse their explicit knowledge, symptomatic of respectively ‘self-conscious’ or ‘outgoing’ types of learners. In addition, Krashen relates the concepts of *attitude* and *aptitude* to acquisition and learning, respectively. For Krashen, attitude predicts acquisition, while aptitude predicts learning. A positive attitude serves to lower learners’ affective filters, and thus allowing the process of acquisition to take place. Aptitude, on the other hand, taps the ability to learn explicitly. According to Krashen, then, especially differences in attitude will predict differences between individuals in L2 proficiency development.

Krashen’s dismissal of aptitude as not being relevant to acquisition has cleared it out of the centre of attention for quite some time. However, in the last decade or so, a number of researchers (e.g., Robinson, 1997; 2001; Skehan, 1998a) have claimed that the construct of aptitude as used in aptitude test batteries such as Carroll and Sapon’s *Modern language aptitude test; the MLAT* (1959) was too restricted in its operationalization, tapping only explicit learning abilities, and they have attempted to redefine the construct. Robinson (2002), for example, distinguishes at least four types of aptitude complexes that are called upon in different settings of second language learning. Apart from aptitude for the ability to learn explicitly, he also distinguishes aptitude for focus on form via recasts, aptitude for incidental learning via oral content and aptitude for incidental learning via written text. Each of these complexes is facilitated by particular cognitive resources, such as attention, memory and processing speed. Skehan (Skehan, 1998a) relates aptitude to learning style, and argues that aptitude should be characterized in terms of learners’ inclinations towards analysis and memory. He argues that some learners are more naturally inclined to analytic
processing, leading to rule-based representations of language, while others are predisposed to the use of memory, leading to a large store of exemplars. It would lead too far to discuss both Robinson’s and Skehan’s models in more detail here, but both models imply that the effectiveness of developing explicit and implicit knowledge is dependent on a particular mix of cognitive abilities.

It has also been suggested that age affects second language acquisition. The Fundamental Difference hypothesis posits that older learners may require explicit information to successfully learn a second language, while young learners can do without and can learn languages entirely implicitly (Bley-Vroman, 1988). Comparing ultimate attainment levels of child and adult immigrants by means of a grammaticality judgment test, DeKeyser (2000) found that those who learned their second language at a young age substantially outperformed older learners. The adult learners were able to match the levels of attainment of young learners only if they had high verbal aptitude abilities as measured with the MLAT (Carroll & Sapon, 1959). DeKeyser argued that maturation causes changes in cognitive functioning, leading either to a loss of the ability to learn implicitly, or to an increased reliance on explicit learning abilities, or both. The implication is that for adult second language learners, but not for child L2 learners, explicit and implicit knowledge interface.

In sum, some individuals may have advantages over others in learning a second language, and these advantages seem to be related to differences in aptitude. Recently, it has been claimed that underlying the construct of aptitude are a number of cognitive resources, and differences between individuals are due to differences in reliance on such resources. In addition, some of these resources may be subject to maturation. The potential explanatory scope of aptitude for language learning is wide, in that it may also explain age and attitude (negative attitudes may result from low aptitude) effects. It is important to point out, though, that the precise involvement of aptitude is as yet rather speculative, and that a lot of work needs to be done in this area.

2.2.6 Summarizing the interface debate

In this section, three very different views on the relationship between explicit and implicit knowledge have been outlined, each attributing a different role to explicit knowledge in the development of second language proficiency. Each of the three interface positions are the result of an analysis of the process of second language acquisition, and the underlying ideas about L2 acquisition are indeed quite different. Krashen’s no interface position is the result of the parallelism he
<table>
<thead>
<tr>
<th>Position</th>
<th>Main proponents</th>
<th>Organisation of knowledge</th>
<th>System(s) of learning</th>
<th>The role of explicit knowledge</th>
<th>Pedagogical implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>No interface</td>
<td>Krashen (1981, 1982)</td>
<td>Explicit and implicit knowledge are two separately organised knowledge systems</td>
<td>Two systems: acquisition and learning for implicit and explicit knowledge, respectively.</td>
<td>Explicit knowledge contributes only indirectly to L2 proficiency development.</td>
<td>Explicit instruction affects learning only; it has little value for acquisition, and may only indirectly promote acquisition</td>
</tr>
<tr>
<td>Strong</td>
<td>Bialystok (1989, 1994); DeKeyser (1998)</td>
<td>Explicit and implicit knowledge are the extremes of one continuous knowledge system</td>
<td>One system; For Bialystok: Analysis; For DeKeyser: a staged learning process during which declarative knowledge is proceduralized and automatized.</td>
<td>For Bialystok, explicit instruction makes learners aware of structural regularities. For DeKeyser, explicit knowledge converts into implicit knowledge</td>
<td>For Bialystok: unclear, but aimed at either analysis or control; For DeKeyser: establishment and automatization of explicit knowledge</td>
</tr>
<tr>
<td>Weak interface</td>
<td>R. Ellis (1994a)</td>
<td>Explicit and implicit knowledge are two separately organised knowledge systems</td>
<td>A specialized system for acquisition of implicit linguistic knowledge; general learning mechanisms for explicit knowledge</td>
<td>Depending on whether a structure is part of a developmental order, explicit knowledge either converts into implicit knowledge, or indirectly facilitates implicit learning.</td>
<td>Two pedagogies, one for each type of knowledge (See Ellis, 1997)</td>
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</tbody>
</table>
assumes between first and second language acquisition. DeKeyser based his ideas on Skill acquisition theory derived from cognitive psychology, and Ellis’s theory is based on information processing theories as proposed by Gass (1988), Schmidt (1990; 1994) and VanPatten (1987). In Table 2.2, the three positions are summarized. In its essence, the interface debate centres on the question of how linguistic knowledge is organised. All three positions make a distinction between explicit and implicit knowledge. Both the no interface position and the weak interface position see the two types of knowledge as completely separate, while the strong interface position views linguistic knowledge to be continuous, varying with respect to the level of awareness and the level of control involved. In addition, both the no and the weak interface position make a distinction between explicit and implicit learning, while the strong interface position recognizes just one learning system.

Obviously, the role of explicit instruction in second language acquisition is most prominent in the strong interface view, and considerable importance is attached to explicit instruction of the rules of grammar. As explicit knowledge is mostly considered to be the starting point of second language proficiency (e.g., DeKeyser, 1998; O’Malley, Chamot, & Walker, 1987; Sharwood Smith, 1988), there is a direct relationship between teaching grammar and second language proficiency. The same applies to Bialystok’s (1994b) views, as she argues that L2 learners benefit from explicit information for developing analysed linguistic knowledge. Proponents of the no interface position acknowledge that explicit knowledge may to some extent facilitate the development of implicit knowledge (Krashen, 1981), but see this as an indirect effect of instruction. Explicit instruction may lower students’ affective filters, or it may make the input more comprehensible. Also, in some instances, some learners may be able to use explicit knowledge as a monitor. The role of explicit knowledge is limited to a facilitating role, though, in that it may positively affect implicit learning processes, and effects of explicit knowledge on L2 proficiency development are severely limited. The weak interface position allows for both direct and indirect effects of instruction, depending on whether the structure is subject to developmental constraints. Explicit knowledge can become implicit if the language learner is developmentally ready. Explicit knowledge can also facilitate implicit learning processes, although the effects will then be delayed.

Although the organisation of knowledge and learning processes make up an important part of the practical value of explicit knowledge, other aspects may weaken or strengthen the effect of FFI as well. An important moderating aspect may be the notion that language development is somehow subject to a natural
orders of acquisition, and that instruction has to match the L2 learners’ stage of development for them to be able to benefit from the instruction. Another potentially interacting variable is the nature of the target structure. And finally, individuals may differ in their ability to exploit explicit knowledge to the benefit of L2 proficiency development. The problem with all these factors, however, is that there is little clarity on how these factors interact.

The goal of this study is to assess the value of explicit knowledge to L2 proficiency development. As the practical value of explicit knowledge is largely determined by whether there is an interface between explicit and implicit knowledge, the concern of the following two sections is to reappraise the interface issue. Both an analysis of second language acquisition theories and FFI research can provide further insights into this debate.

2.3 Second language knowledge, use, and learning

2.3.1 Introduction

One way to further the interface debate is to relate the constructs of explicit and implicit knowledge to recent developments in SLA theory in order to come to more precise definitions of explicit and implicit knowledge. In the previous section, implicit knowledge has been characterized as the ability to use the L2 grammar fluently and accurately, and as the prime source of knowledge underpinning L2 proficiency. The aim of this section is to provide more insights into the construct of implicit knowledge by teasing apart various aspects of proficiency. First, the nature and representation of the grammatical system will be considered in 2.3.2, which should shed light onto what grammar is. In 2.3.3, the focus shifts to how L2 learners use their grammars when they produce language, followed by a discussion of the mechanisms that enable second language acquisition in 2.3.4. In addition, explicit knowledge will be more carefully defined in 2.3.5. With this information, the questions that are central to the interface debate can be reappraised (2.3.6). Given what is known about the nature of explicit and implicit knowledge, can there be conversion of explicit into implicit knowledge, as supposed by the strong interface position? And what is the scope for explicit knowledge for use in communication, and can it facilitate acquisition? All in all, the section brings together various strands of second language acquisition theory to evaluate instructed SLA theories.
2.3.2 The nature of second language grammatical knowledge

This subsection focuses on the nature of the grammatical system underpinning second language proficiency. Broadly speaking, there are two schools of thought on what grammatical knowledge is and how grammatical knowledge develops: formal linguistics favours instantaneous or innatist models of language development, while constructivist approaches, to which cognitive linguistics, emergentism, connectionism, and functional linguistics belong (Ellis, 2003), see language development as emergent in the course of acquisition. In this section, second language development is approached from a constructivist perspective.

Formal linguistics argues that linguistic knowledge is governed by a universal grammar: innately specified linguistic principles or categories that guide the acquisition process. Formal linguists have primarily been concerned with representation of linguistic knowledge, and they have come a long way in describing linguistic knowledge from one stage to the next (Gregg, 2001). Second language acquisition is seen as a process of setting and resetting parameters, which means that from the very start, second language use – or at least those aspects of language that are indeed UG constrained – is rule-governed (As Sharwood-Smith (1993) points out, principles and parameters are strictly speaking not rules, but adherence to them would result in highly systematic, rule-like behaviour). Thus, the rules of language resemble those of – say – mathematics, in that they are hard and exceptionless algorithms. The theory does not include mechanisms of learning, and has generally had a blind spot for the experiences that cause language to change and develop (Bialystok, 2002). In addition, the theory is difficult to apply to language pedagogy, because the goals of UG theory and language pedagogy are too divergent, as Ellis points out in an appraisal of UG theory (1995). It makes predictions that run counter to what pedagogical practice knows to be effective. This may in fact be a serious flaw of the theory, as one could argue that the strength of any second language acquisition theory is also determined by how well it can address pedagogical concerns. This is at least what Ellis (1995: p. 88) suggests when citing Brumfit: “second language acquisition theory needs to be compatible with the practice of teaching, as much as teaching needs to be compatible with second language acquisition theory” (Brumfit, 1994: p. 270).

In recent years, gradualist or constructivist approaches have gained currency. They posit that grammar is emergent in the course of acquisition rather than innate, and the primary mechanisms that cause such a grammar to emerge are general associative learning mechanisms. Cognitive psychologists have pointed
out that the human mind specializes in the ability to note ‘if A then B’ concurrences, and these kinds of associations are at the heart of learning. Learning is largely ‘attending to regularities’ (e.g., Goodson, 2003). Most constructivists would agree that from these regularities an abstract grammar can ultimately emerge. Associations between A and B become stronger when they appear together often, until at some point the occurrence of A actually cues B: they have become a chunk. In the course of interacting with language, literally millions of chunks are established, represented in a complex network of interrelated associations. A hierarchical organisation, a grammar, originates when chunks are associated with other chunks (Ellis, 2003). Therefore, rules of grammar are essentially regularities rather than rules: strong associations that enter into rule-like behaviour. Thus, language can to some extent be captured in what seem to be rules, but also has probabilistic properties. Indeed, the work of corpus linguists (e.g., Nattinger & DeCarrico, 1992; Pawley & Syder, 1983; Sinclair, 1991) has demonstrated that there are indeed many features of language that are not in keeping with rule-like behaviour.

N. Ellis (2003) suggests that the typical course of language development is from ‘formulae’ to ‘limited scope patterns’ to ‘constructions’. The argument is basically that language learning starts out with accumulating formulae or exemplars of the second language; for L2 learners, these will primarily be words and short phrases that are stored as exemplars and called upon as such. The store of exemplars that is gradually built up this way is the source out of which ‘limited scope patterns’ grow. Limited scope patterns can be defined as lexically specified ‘rules’: i.e.: slot-and-frame patterns whose operation depends on the presence of a particular lexical environment. N. Ellis (2003) illustrates how hierarchical structure slowly emerges with an example from first language acquisition. Suppose a child is able to piece together the exemplars (Lulu)(gone), (Teddy)(gone), (the ball)(gone). Once a number of such exemplars are available, the child may abstract an overarching chunk containing an open element (X gone), where X can be filled with any concrete object or person. The scope of this slot-and-frame pattern is still limited. However, at some point it may be slotted in with a chunk as well ((funny)(man))(gone). Thus, the lexically specific nature of slot-and-frame patterns is gradually lost, and they become available for use in more, and more productive settings (Ellis, 2003; Fine & Lieven, 1997). A hierarchical structure much like a phrase grammar is the result.

Ultimately, this abstraction process leads to a grammar much like construction grammar as proposed by among others Goldberg (1995). A construction is a conventionalized form-meaning pair, and it is the basic building block of language
Each utterance is an assembly of constructions within constructions. Examples of constructions are [Adj Noun], which is a schematic construction that may be slotted in in numerous ways. Constructions also operate below word level, in the case of [Verb stem-past tense marker], which leads to walked, signed, and sometimes goed. However, a construction can be specific as well. Roman Catholic, red herring, and side mirror are examples of constructions in their own right, because together these words designate a conventionalized meaning that cannot be computed from the words' independent meanings, and/or because the two words have become a collocation due to frequency of occurrence. In order to fully capture this, red, herring, and red herring must be independently represented constructions. The most important feature of constructions, then – whether schematic or specific – is that they carry meaning.

As a final example, consider Goldberg's sentence, Pat sneezed the napkin off the table, (1995: p. 224) an example that shows how even abstract sentence level constructions carry meaning. The verb sneeze is used in a ditransitive sentence here which is normally impossible for this verb. In this case, the sentence is still grammatical, because the prototypical meaning of ditransitive constructions – agent-successfully-causes-recipient-to-move-patient – is not compromised.

In short, the development of rule-governed L2 proficiency, or implicit knowledge, is a slow and gradual process of figuring language out on the basis of frequency of co-occurrence. As Ellis puts it: "... the acquisition of grammar is the piecemeal learning of many thousands of constructions and the frequency-biased abstraction of regularities within them." (2003: p. 67). L2 learners face the task of internalizing enormous amounts of chunks and abstracting schematic constructions on the basis of these. And, of course, they have to learn to use this 'grammar'.

### 2.3.3 Second language use

The central concern in this subsection is how developing second language grammars as put forward in the previous subsection are put to use by L2 learners. In line with the notion that second language grammar has both rule-like and probabilistic properties, it will be argued that proficiency has computational properties, but is also to some extent exemplar-based. A number of researchers have indeed argued in favour of a dual system of language processing (e.g., Carr & Curran, 1994; Pawley & Syder, 1983; Sinclair, 1991; Skehan, 1998b). They see

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3 Throughout this report, continued use will be made of terms such as rules and grammar, although they may not accurately convey these aspects of the linguistic system.
linguistic proficiency as the result of cooperation between a rule-based linguistic system and an exemplar-based system. The argument is that language users do not always compute sentences. In fact, they have a large store of ready-made exemplars or chunks of language at their disposal, and language proficiency is to a greater or lesser extent the result of retrieving and piecing together these ready-made exemplars.

The most pervasive view, however, is that producing language is a computational process. A well-known observation is that of L2 learners attaching the past tense marker to verbs having irregular past tense forms (e.g., he goed instead of he went). Since the L2 learner cannot have observed goed in the input, he or she must have been applying and overgeneralizing a rule. Thus, producing language must be seen as filling out rules with lexical content, irrespective of whether these rules are fully developed or early inaccurate exponents of them. This in turn means that utterance construction involves some quite advanced planning: the speaker has to generate a context-appropriate message; the message must be grammatically encoded in such a way that it expresses the intended meaning; it has to be morphologically and phonologically encoded; and ultimately articulated (e.g., Levelt, 1999). An advantage of such a computational production system is that it allows speakers to be highly creative, because each utterance is generated anew. It also comes with a number of assumptions. Most importantly, given the demands of online communication, such a computational process has to be highly efficient and cheap in terms of cognitive resources.

Although L2 proficiency is likely to be scaffolded by such a computational production system, it probably is not the result of mere computation. In fact, it is commonly acknowledged that particular aspects of language use are exemplar-based or formulaic. This simply means that some phrases are stored as whole constructions rather than generated anew each time they are used. They are phrases so frequent in everyday language that they have become institutionalized. "Roman Catholic" and "red herring" mentioned in the previous section are examples, but short sentences such as: "Have some more!", "Can I help?" may also be.

The question that rises is where institutionalization stops. There are in fact good arguments supporting the idea that language use leans quite heavily on direct retrieval of exemplars from memory. One important argument supporting this is the observation that people seem to limit themselves to fixed and frequently recurring combinations of lexical elements, rather than exploiting the grammar’s infinite possibilities to be creative. Pawley & Syder (1983) have called this phenomenon native-like selection, and they have proposed lexicalized sentence


stems to account for this phenomenon. Lexicalisation refers to institutionalization of stretches of language; expressions that native speakers would typically use in particular circumstances, social conventions almost. Pawley and Syder provide a list of examples of lexicalized sentence stems with the verb to think: ‘Come to think of it, …’, ‘Think nothing of it’, ‘Think it over’, etc.; but also ‘I think a lot of P’ and ‘P thinks nothing of V-ing NP’ (e.g. walking 50 miles)’ (p. 213). The first three are examples of memorized sentences, and the latter two are what they call lexicalized sentence stems, consisting of a lexicalized nucleus and open elements which afford some coding on behalf of the speaker. The crucial argument is that – rather than using our grammatical knowledge to compute utterances, we revert to “… strings which the speaker or hearer is capable of consciously assembling or analysing, but which on most occasions of use are recalled as wholes or as automatically chained strings.” (Pawley & Syder, 1983: p. 205).

Skehan (1998a) similarly argues for a substantial role of an exemplar-based system in producing language. Taking a processing perspective, he questions several of the assumptions that a primarily computational view on language production entails. For example, he takes issue with the assumption that rule-based language generation would be cheap in terms of cognitive processing. He argues that real-time communication is too demanding to each time generate utterances from scratch, and that language speakers in fact fail the processing capacities to do this. For this reason, they depend on memory-based language production a great deal of the time. In Skehan’s own words: “Producing speech seems to be much more a case of improvising on a clause-by-clause basis, using lexical elements … wherever possible, to minimize processing demands. Then, as ends-of-clauses are approached, improvisation skills allow us to tack one clause on to the next … ” (1998a: p. 37).

Interestingly, Skehan’s views on L2 processing explain how the rule-based and memory-based systems cooperate, and they link nicely to the views on grammatical development put forward in the previous subsection (2.3.2). He sketches three stages: lexicalisation, syntacticalization and relexicalization, which delineate the course of acquisition (1998a). Based on L1 research, research by VanPatten (1996), and Schmidt’s noticing hypothesis (1990), he argues that by default second language learners focus on meaningful aspects of language rather than formal. As a result, second language acquisition in its initial stages is mainly a process of internalizing lexical elements of the L2. However, at some point, these lexical elements are subjected to syntacticalization, a process Skehan does not elaborate upon much, but it seems to refer to an analysis mechanism leading
to rule-based linguistic knowledge. The final stage, relexicalization, is more or less
equal to a process of automatization. In order to meet the demands of real-time
communication, syntacticalized knowledge is relexicalized again, resulting in
chunks much like Pawley and Syder’s lexicalised sentence stems.

Thus, like Ellis (2003: see previous subsection), Skehan argues that grammar
learning starts with the internalization of exemplars or formulae, that are later
’syntacticalized’ into grammatical structure. In addition, Skehan seems to argue
that there is no end to the institutionalization of chunks of language: chunk
learning is an ever continuing process that does not stop once the grammar is
fully developed (if one can even ever speak of a fully developed grammar). For
efficiency reasons, speakers depend on constructions with lexicalized sentence
stems as large as possible. The result is a dual processing system, based on rules
and exemplars. "When time is pressing, and contextual support high, memory-
based communication is appropriate. When there is more time, and precision is
important, the rule-based system can be accessed." (Skehan, 1998a: p. 90/91).
Although language users may have a fully developed grammatical system, in
everyday language use, they depend on relexicalized chunks of language that are
the result of automatization processes. Speakers will tend to revert to their
grammatical knowledge only when the situation calls for it, or when it allows
them the time to do so.

2.3.4 Implicit learning processes

The previous subsections have focused on defining the nature and use of
implicit grammatical knowledge. This subsection turns to implicit learning
processes, the processes that lead to the establishment of associations and the
subsequent abstraction of grammatical categories. In the interface debate, a
distinction is made between explicit and implicit learning, each leading to
qualitatively different types of linguistic knowledge. The goal of this subsection,
then, is to shed some light on the learning processes that lead to implicit
knowledge. However, as the implicit learning processes themselves are not the
focus of this study, they will not be discussed at length, but merely in relation to
the nature and use of implicit knowledge as outlined in the previous subsections.

In the last two decades, second language acquisition researchers have
increasingly adopted information processing models to explain how second
language learners process linguistic input (e.g., Robinson, 2003; Schmidt, 1990;
1994; ed., 1995; Skehan, 1998a; Tomlin & Villa, 1994). The goal of information
processing theory is to explain human behaviour through cognition and it is
firmly based in evolution theories of human cognition (Goodson, 2003). Language is in this view not regarded ‘a special case’ which requires innate linguistic universals in order to be learnt. Like all learning, it is rooted in simple and general learning processes, rather than in processes that are unique to language. Information processing can roughly be divided into three general stages (Robinson, 2003). These stages are the perceptual encoding stage, where input is perceived through our senses and encoded, and where certain aspects of the input are mentally registered or selected for further processing. The selected input, often referred to as intake, is the input for the next stage: central processing, where working, short term memory and long-term memory interact in order to achieve comprehension of the message. The last stage is responding, where language users make decisions about how to respond to the input.

The general understanding is that attention is the starting point for all learning (Schmidt, 2001: 12). In the literature, the term attention is actually used to refer to three separate functions (Robinson, 2003), but here it refers to a selection mechanism that takes care of perceptual encoding. As it is impossible to attend to all the input humans perceive, there is a focalising mechanism that focuses on one component at a time, called attention. Attention is a serial mechanism, bringing sensory and/or memory input into a heightened state of awareness on a moment to moment basis. While perceived input decays quickly, attended input actually lasts for a while; and if input is attended to several times it may be written in long-term memory. Thus, attention mediates between input and memory, either encoding new information in long-term memory or enforcing existing encodes, and as such, it is crucial to learning (Goodson, 2003). Schmidt (Schmidt, 1990) was among the first to apply information processing theory to second language acquisition, and introduced noticing as the linguistic equivalent to attention. Noticing specifically refers to paying attention to linguistic form, and occurs, for instance, when you stop to consider the meaning of an unfamiliar word. For Schmidt, noticing operates upon exemplars rather than rules: “the objects of attention and noticing are elements of the surface structure of utterances in the input – instances of language, rather than any abstract rules or principles of which such instances may be exemplars” (2001: p. 5). Noticing or attention, then, is the mechanism that takes care of what Skehan (1998a) referred to as lexicalization: and what N. Ellis (2003) identified as internalizing exemplars. Obviously, the question that rises is how syntacticalization, or the abstraction of grammar, takes place.

Numerous proposals have been put forward to explain the syntacticalization phase, but while there is fairly wide-spread agreement on the construct of
noticing, little is known about the syntacticalization process. Doughty (2001b) discusses potential processes for learning in some depth. Following Bialystok (1994b: see also 2.2.2), she argues that a process of analysis is taking place during which unstructured representations become more structured. Doughty supposes that underlying analysis are mapping and restructuring. Mapping refers to learners’ natural tendencies to connect forms with meanings or functions, while restructuring refers to sudden changes in a learner’s interlanguage that lead to more efficient use of particular aspects of the language (Doughty, 2001b). However, the precise workings of restructuring remain unclear. While Doughty stresses that little is known yet about these mechanisms, she does point out that “... mapping and restructuring appear to be both continually in operation and not subject to conscious reflection, although once the insight has occurred, the knowledge itself may become increasingly available for metalinguistic comment (Bialystok, 1994b)”.

In the previous subsection, a parallel was already drawn between relexicalization and automatization. Relexicalization refers to the establishment of large stretches of analyses language that are retrieved as a whole from memory. Automatization processes probably take care of this. DeKeyser (2001) points out that automatization of grammar rules has received little attention in SLA research, but based on the evidence that is available, he argues that automatization involves both the automatization of rules and increased speed of retrieving exemplars from memory. How the first comes about is unclear, but increased retrieval speed results from extensive practice. This implies that importance of producing the second language during L2 acquisition primarily lies in automatizing analyzed knowledge.

Implicit learning, then, can be described as a staged process of noticing, analysis, and automatization. It results from frequent exposure and a subconscious process of figuring language out, and it is the inevitable and uncontrollable result of information processing (Hulstijn, 2002). The question is how these views on implicit knowledge and learning relate to explicit knowledge and learning, as this is central in the interface debate.

2.3.5 Explicit knowledge and learning

While the previous subsections exclusively focused on implicit knowledge and implicit learning, the focus now briefly shifts to explicit knowledge and explicit learning. In the introduction (Chapter 1), explicit knowledge was defined as factual and conscious knowledge about the second language. In essence, this
characterization is correct. However, it is also incomplete. The intention of this subsection is to define both explicit knowledge and learning more precisely. In doing so, it draws gracefully on recently published work by R. Ellis (2004) and Hulstijn (2002).

Reviewing Ellis’s (2004) article on explicit knowledge, it becomes apparent that an important aspect of the definition of explicit knowledge is that it actually involves metalinguistic awareness: the ability to treat the language as an object of thought. This ability requires conscious awareness and knowledge about the language that can be put in factual declarative statements (irrespective of whether these statements are correct or incorrect). If you consider the definition that R. Ellis arrives at, this seems to be one of the main pillars of explicit knowledge:

“Explicit L2 knowledge is the declarative and often anomalous knowledge of the phonological, lexical, grammatical, pragmatic, and sociocritical features of an L2 together with the metalanguage for labeling this knowledge. It is held consciously and is learnable and verbalizable. It is typically accessed through controlled processing when L2 learners experience some kind of linguistic difficulty in the use of the L2. Learners vary in the breadth and depth of their L2 explicit knowledge” (2004: pp. 244/245)

Explicit knowledge, then, is factual knowledge, no different from any other encyclopaedic knowledge, such as knowing that clavicula is Latin for ‘collar bone’. This is also why it is verbalizable: people can express such knowledge about the language in words, although they may not have the proper verbal repertoire to phrase their knowledge accurately. And much like any other factual knowledge, it may be incorrect or incomplete. In short, explicit knowledge involves an explicit understanding about language that can be put into words in as far as the speaker has the vocabulary to do so.

In line with the idea that explicit knowledge always involves metalinguistic awareness, explicit learning must be a deliberate, wilfully controlled process. It refers to the conscious establishment of declarative knowledge. Obviously, as it involves wilful control, this kind of learning is amenable to instructional efforts. Hulstijn defines explicit learning as follows:

“Explicit learning is a conscious, deliberate process of concept formation and concept linking. This may either take place when learners are being taught concepts and rules by an instructor or textbook, or when they operate in a self-initiated learning mode, trying to develop concepts and rules themselves.” (2002: p. 206)
This definition reflects that explicit learning is essentially conscious, and it agrees well with Ellis’s definition of explicit knowledge. Interestingly, Hulstijn acknowledges that explicit knowledge can come about in two different circumstances. First, it can result from reflection upon implicit grammatical knowledge, either self-initiated or through instruction, as Bialystok (1994b) and Reber (1989) have argued. Second, it can be established through instruction, and this is the reality in most instructed second language acquisition classrooms. More often than not, L2 students have to try to consciously understand the grammar of the L2 without the implicit grammatical knowledge base to draw upon. After all, the reason to teach a particular grammatical form is almost always because teachers suppose or perhaps perceive a gap in the student’s grammatical knowledge. The intention in such cases is that teaching the grammar explicitly ultimately leads to implicit grammatical knowledge. And this is the central concern of this study: does explicit instruction aiming for explicit knowledge positively affect noticing, analysis, or automatization, the processes underlying the development of L2 proficiency?

2.3.6 Reappraising the interface debate

The development of implicit second language grammatical knowledge has been described in this section as a staged process during which chunks of language are internalized, analysed, and automatized. Implicit knowledge should be seen as an ever developing system of associations that ultimately enter into rule-like behaviour, resulting in a grammatical system resembling construction grammar. For reasons of economy, language users do not tend to exploit the full generic power of their grammatical system, but primarily resort to piecing together memorized chunks that may be quite large and require minimal coding, that have been put in place through automatization processes. Explicit knowledge has been defined as conscious, factual, and to some extent verbalizable knowledge, that reflects – although not necessarily correctly – the implicit grammatical system. It can come about in two circumstances: either it is the result of reflection upon the developing grammatical system, or it is the result of instruction, most commonly the case in second language classrooms. The question is whether there is scope for explicit knowledge to play a role in the development of implicit knowledge, given the view outlined in this section.
The interface debate

The interface positions either predict explicit knowledge to convert into implicit knowledge (the strong and the weak interface position), or to facilitate the acquisition of implicit knowledge (the weak and the no interface position). The way implicit and explicit knowledge have been described in this section clearly suggests a dichotomy between the two types of knowledge. In the words of R. Ellis (2004):

"Adopting a connectionist account of implicit linguistic knowledge as an elaborate interconnected network ..., it is not easy to see how knowledge as weighted content (i.e., as a set of neural pathways of greater or lesser strength) can be anything other than separate from knowledge of linguistic facts." (2004: p. 234)

Similarly, both types of knowledge most likely result from two different learning processes. One that is essentially implicit, incidental and the inevitable result of information processing, while the other has been defined as a deliberate and conscious effort to learn rules and concepts. In terms of organisation of knowledge, then, the views on L2 proficiency outlined in this section do not seem to agree with the no interface position and the weak interface position in as far as it predicts conversion of knowledge.

Nevertheless, there are interesting parallels between some of the theoretical notions introduced by proponents of the strong interface position and the views outlined in this section. First of all, Bialystok’s analysis construct, "the process by which mental representations that were loosely organized around meanings (knowledge of the world) become rearranged into explicit representations that are organized around formal structures" (1994a: p. 159; see also 2.2.2), turns out to capture the syntacticalization process quite adequately, if one bears in mind that she uses the term 'explicit' in a different sense. But there is also an interesting parallel with DeKeyser’s (1998) tree-step process (knowledge moves from declarative to procedural, to automatized). Arguably, there is but one difference: for DeKeyser, linguistic knowledge starts out as rules, while the views outlined here posit that L2 learning starts with exemplars.

The role of explicit knowledge, then, is probably limited to facilitating implicit learning processes. The development of a hierarchical grammatical system is ultimately a matter of setting the weights properly, normally the result of a frequency-biased process of establishing rule-like associations. Any contribution of explicit instruction to the development of implicit knowledge lies in the provision of exemplars that at some point trigger implicit learning processes. This
does not mean that explicit knowledge converts into implicit knowledge; it simply means that incidental implicit learning processes are "concomitant" to deliberate explicit learning processes (Hulstijn, 2002). The value of explicit instruction does not lie in the establishment of explicit knowledge; it simply provides exemplars in much the same way as implicit instruction does.

**Developmental readiness, structure complexity, and individual differences**

In the previous section, a number of potentially interacting factors were discussed. These were developmental readiness, the nature or complexity of the target structure and individual differences. The question is how such interactions should be understood given the theory of L2 grammar development outlined here.

Developmental readiness was discussed in 2.2.3: it refers to the idea that L2 language development is to some extent subject to fixed developmental orders, which puts constraints on the potential effectiveness of FFI. With regard to explicit knowledge, it is difficult to maintain that anything that is deliberately and consciously learned is constrained by natural orders of acquisition. Like any other type of deliberate learning, it is merely constrained by one's mental capacities. It should be pointed out, though, that learning explicit grammatical knowledge is probably easier for those that actually already have implicitly acquired knowledge of the rule to be taught. However, as pointed out, the SLA classroom is typically an environment where rules are taught on the basis of perceived knowledge gaps. Implicit grammatical knowledge may well be subject to developmental constraints, though. L2 development has been described as moving from formulae to limited scope patterns to constructions. This development in itself reflects stages, and it does not necessarily apply to language as whole, but to individual rules of language. Thus, in global terms, one can predict that the development of a particular limited scope pattern depends on whether the L2 learner possesses a sufficient amount of related exemplars, and constructions can be developed by the grace of the presence of specific limited scope patterns. How this works out for individual structures depends on the nature of these structures, and perhaps also on the extent to which they are interdependent on other structures.

In 2.2.4, another issue that was put forward as relevant to the interface debate was the idea that the practical value of explicit knowledge may vary between grammar structures. However, from the perspective adopted here, it seems most plausible that there are no fundamental differences in learning different grammar
structures, neither for explicit nor for implicit grammar learning. For explicit grammar learning, learning is no different than any other type of learning: L2 learners will have most difficulty with complex grammar structures. With respect to implicit grammar learning, the constructs of scope and reliability as proposed by Hulstijn and De Graaff (1994) seem particularly important. If language learning is a function of exposure to the target structures, then the evidence that is available in the input must substantially affect implicit learning processes. Differences may also arise, though, because of differences between structures in hierarchical depth, or because some structures appear in many different forms. However, such differences are most likely to lead to differences in rate of learning. Thus, learning to use a morphological rule such as Dutch degrees of comparison may be relatively fast, because it is relatively independent of other grammar structures and relatively shallow in hierarchical terms in that it does not exceed word level.

A final issue that was brought to the fore in 2.2.5 is how individual differences (IDs) affect grammatical development. Aspects of individual differences discussed were attitude, aptitude, age, and L1 background. The perspective outlined here does not have radical consequences for the potential influence of individual differences. An important consequence for positing two separate systems is that the each type of learning may be affected differently by each type of ID. Thus, a L2 learner may have positive attitudes towards explicit learning tasks, but dislike the use of the L2 in more spontaneous situations, leading to faltering implicit learning. It is similarly possible that age and L1 background affect explicit and implicit learning differently. With regard to aptitude, it seems that the distinction made between explicit and implicit learning and the staged implicit learning process outlined in this section may in fact link quite easily to Robinson’s (2002) model of aptitude complexes for different types of learning. Robinson distinguishes aptitudes for explicit learning, noticing, and learning via oral and written input. The first two aptitude complexes link directly to processes described in this section. The latter two may in fact refer to L2 learners’ aptitudes to abstract grammar from exemplars. Obviously, all this is highly speculative, but deserves examination.

In sum, an analysis of the second language learning process suggests that the role of explicit knowledge is limited to a facilitative role: it may facilitate implicit learning process in that it provides exemplars that trigger implicit learning processes. If this is how explicit instruction affects implicit learning, then there is little reason to assume that it would be superior to implicit types of instruction.
In the next section, form-focused instruction studies will be inspected in search of support for this conclusion.

### 2.4 The interface debate and form-focused instruction research

#### 2.4.1 Introduction

Obviously, one area of research in second language acquisition that can potentially contribute to the interface debate is form-focused instruction research. If explicit instruction can be demonstrated to promote the development of L2 proficiency more than implicit instruction, then that would provide a strong argument in favour of a weak or perhaps even a strong interface position. Despite the wealth of FFI studies that have been conducted in the last three decennia, there are not many that have addressed this issue (DeKeyser, 2003).

In the introduction, it was already pointed out that form-focused instruction research has had little recognition for the idea that explicit and implicit knowledge are separate knowledge systems, and that FFI research has suffered from considerable bias in measuring linguistic knowledge gains. The question that rises, then, is to what extent FFI research provides evidence for an interface between explicit and implicit knowledge. Keeping the need to differentiate between explicit and implicit knowledge in mind, has FFI research effectively demonstrated that explicit instruction promotes the development of implicit knowledge? And what is the importance of related constructs such as developmental readiness, the type of target structure and individual differences if one applies this differentiation to findings reported so far? These issues will be addressed in this section.

The measurement of L2 knowledge gains has been undertaken in many different ways. Before one can adequately appreciate the implications of particular findings, it is important to understand what would be measures of explicit and implicit knowledge. This is briefly discussed in subsection 2.4.2. Subsequently, in 2.4.3, a review of FFI research by R. Ellis is discussed in which the impact of FFI on implicit measures of progress is investigated. Next, in 2.4.4, criteria are laid down for what would constitute evidence for an interface between explicit and implicit knowledge, and studies that meet these criteria are scrutinized in search of such evidence. Then, in 2.4.5, studies are reviewed that
have investigated the effects of explicit and implicit instruction in relation to potentially interacting variables.

2.4.2 Measures of explicit and implicit knowledge

A complicating issue when reviewing research conducted so far is deciding what constitute valid measures of explicit and implicit knowledge. Some guidelines can be found in the literature, though. R. Ellis seems to consider any "...activity that calls for unplanned language use directed at fulfilling some communicative purpose..." (2002: p. 225) a measure of implicit knowledge, whereas tests that allow for monitoring would measure explicit knowledge. Norris & Ortega make a similar distinction when they contrast 'free constructed response' measures with 'meta-linguistic judgements', 'selected responses', and 'constrained constructed responses', the latter measures drawing on "... the application of explicit declarative knowledge under controlled conditions..." (2000: p. 486).

Explicit knowledge tests should call on the learners’ knowledge about the rules of the second language. Response time and the measurement of knowledge of structures in isolated contexts seem to be the most important means to achieve this. A study by Han and Ellis (1998) points out the importance of response time. Using factor analysis on five measures of proficiency – oral proficiency, timed and untimed grammaticality judgements and metalingual comments, they identified two distinct factors: the timed measures (oral proficiency and timed grammaticality judgements) together loaded on one factor, while the untimed measures (untimed grammaticality judgements and metalingual comments) loaded on the other. The former set of measures may be seen to represent implicit knowledge, and the second set explicit knowledge. Therefore, Han and Ellis in fact argue that these results provide evidence for the separateness of explicit and implicit knowledge.

It may be difficult to construct a test of explicit knowledge that prohibits language learners to use their implicit knowledge (Ellis, 2004). For this reason, testing in isolated contexts is of crucial importance. Test takers do not necessarily have to be aware of the fact that particular features of language are in focus, but the problem should be such that they are inclined to search their memories for solutions. Although the possibility of using implicit knowledge cannot be excluded entirely, in the case of L2 acquisition, test takers often do not have implicit knowledge to help them perform well on the explicit knowledge test.
Conversely, tests of implicit knowledge have to be unfocused and serving a communicative purpose (R. Ellis, 2002). They should elicit language use in which the use of the features of grammar under investigation is incidental. The study by Han and Ellis (1998) discussed above suggests that oral proficiency and timed grammaticality judgements accomplish this. However, given that timed grammaticality judgement task do test in isolated contexts and do not fulfil a communicative purpose, this type is not considered to be a measure of implicit knowledge in this study.

2.4.3 FFI and its impact on implicit knowledge: Ellis (2002)

Recognizing the need to distinguish between explicit and implicit knowledge, R. Ellis (2002) reviews studies that have assessed how FFI affects the development of implicit knowledge. Although it does not explicitly address differences between explicit and implicit types of FFI, this review is of obvious importance to this study, as it tries to assess the impact of FFI on implicit knowledge measures. The studies included in Ellis’s review are: Harley (1989); Day and Shapson (2001); Lyster (1994); VanPatten and Sanz (1995); Salaberry (1997); Mackey and Philp (1998); Long, Inagaki and Ortega (1998); Mackey (1999); Doughty and Varela (1998); Williams and Evans (1998); and Muranoi (2000); and Ellis analysed these studies on a number of aspects, including the age of the subjects, the kind of structure taught (morphological, syntactical or formulaic), and the type and extent of the instruction. The majority of these studies report success in improving implicit knowledge: seven out of eleven studies.

Ellis’s review suggests that the kind of grammar structure makes a difference. The four studies in which FFI did not lead to gains in implicit knowledge, all targeted syntactic structures. If the targeted structure was morphological (3 studies) or formulaic (1 study), the instruction was always successful. For syntactic structures, success was reported by three out of seven studies. In addition, Ellis points out that one of the determining factors for successful FFI may well be the availability of the targeted structure in everyday input. The structures that were successfully taught were structures that students may have encountered quite frequently outside the classroom environment.

Another factor that Ellis (2002) identifies as important to achieving success, is the extensiveness of the instruction. In seven studies, the instruction was extensive (i.e.: several hours and/or compound tasks), and six of these studies report positive effects. The one exception is Williams and Evans (1998), which
featured the complex passive construction. Ellis identifies a few more factors that may be of importance, although it is difficult to attribute success to these factors unequivocally. For example, in four out of eleven studies, the subjects were young (below 12), and in three of these four, positive effects were reported. However, the targeted grammar rules in these three studies were morphological and formulaic, and the unsuccessful young learners were instructed in a syntactic rule. Thus, age may be of influence, but this cannot be asserted with any certainty.

Ellis concludes that by and large, FFI seems to impact on implicit knowledge, and that "key factors" for successful FFI are "the complexity of target structure, the extent of the instruction, and the availability of the target structure in noninstructional input" (p. 234). However, it is important to recognize that the instruction as realized in the studies included in Ellis’s review all operationalized the instruction in highly meaningful or communicative ways. For example Doughty and Varela (1998), Long, Inagaki and Ortega (1998), Mackey and Philp (1998), and Mackey (1999) all used implicit recasting techniques. Such instruction probably directly affects implicit learning processes. Muranoi (2000) also used recasting techniques, but combined recasting with explicit rule provision. Likewise, the studies of Day and Shapson (2001), Harley (1989), Lyster (1994), and Williams and Evans (1998) also included some explicit instruction, but it was embedded in a compound of communicative tasks, such as linguistic games, role plays, reading and writing activities, etc. These studies, too, provide ample occasion for immediate implicit learning. The instruction in the studies of Salaberry (1997) and VanPatten and Sanz (1995) were the most explicit. Both targeted Spanish preverbal pronouns, but only VanPatten and Sanz found the instruction to impact on written proficiency.

As these studies made little use of explicit types of instruction, no conclusions can be drawn about positive effects of explicit instruction on L2 development. The studies that did use explicit types of instruction, mostly also provided ample occasion for implicit learning. Ellis does suspect, though, that explicit instruction may be more effective. Referring to his stance on the interface between implicit and explicit knowledge and the large amount of studies that have shown that FFI affects explicit knowledge, he speculates that a more effective route to L2 proficiency may be through developing explicit knowledge on behalf of the L2 learner.
2.4.4 The interface between explicit and implicit knowledge

Although R. Ellis (2002) has established that FFI impacts on the development of L2 proficiency as measured by implicit knowledge tests, superiority of explicit types of instruction over implicit types of instruction – or vice versa, for that matter – was not demonstrated. This subsection zooms in further on studies that have the potential to address the interface debate. The best evidence for an interface between explicit and implicit knowledge would be provided by studies that monitor implicit grammatical development, and that compare groups with and without explicit knowledge of a particular target structure. This has a number of research design consequences. First of all, explicit and implicit treatments should be compared. Obviously, the explicit treatment is intended to establish explicit knowledge of a particular target structure. However, teaching rules explicitly may not just lead to explicit knowledge; it provides exemplars to the L2 learners that may trigger implicit learning processes as well. For this reason, it is important to contrast the explicit instruction group with an implicit instruction group rather than with a true uninstructed control group. This way, the amount of exposure to the target structure can be kept more or less equal, which neutralizes any effects of concomitant implicit learning. A second requirement is that explicit progress should be measured in addition to implicit progress. This makes it possible to assess whether the groups compared indeed contrast with respect to their explicit knowledge of the target structure.

Just one study was found meeting these requirements: a study by Sanz and Morgan-Short (2004). In addition, the studies of Bienfait (2002), Muranoi (2000), VanPatten and Sanz (1995), and Williams and Evans (1998) meet at least the most essential requirements of comparing explicit instruction with a control group, and using an implicit measure to assess L2 development. These studies will be discussed in this subsection. Table 2.3 summarizes them.

As pointed out, the design of Sanz and Morgan-Short’s (2004) study addresses the interface debate best. In their study, the instruction was delivered by the computer, and involved practice in Spanish preverbal pronouns. Their subjects were university students learning Spanish. In the instruction, the students were faced with sentences containing the target structure, and they had to respond to it appropriately, depending on the task. They compared four different treatment conditions: in one condition, this practice was accompanied by explicit rule explanation, another condition involved explicit feedback during the practice, one condition featured both rule explanation and feedback, and one featured none of these. They measured progress by means of a sentence completion task and a written video retelling task. In the sentence completion task subjects had to use a
particular verb to finish the sentence appropriately. As it did not involve time-pressure, and required subjects to use the rule in a controlled context, it may be accepted as a measure of explicit knowledge. The video retelling task was a free constructed response task, and thus constitutes a measure of implicit progress.

Sanz and Morgan-Short found all four conditions to improve significantly on both measures of progress, but there were no differences between the groups. As there were no differences found between the groups in progress on the implicit measure, this study does not provide evidence for an interface between explicit and implicit knowledge. However, there were also no differences in explicit gain. This could explain why explicit instruction was not found to impact more on L2 proficiency than implicit instruction: the groups compared did not differ in terms of explicit knowledge. This latter finding is important. Apparently, comparing explicitly and implicitly instructed groups is no guarantee for significant explicit knowledge differences. It confirms the importance of the requirement that both explicit and implicit progress be measured in order to assess the interface issue.

The goal of Muranoi’s (2000) study was to investigate the effect of interaction enhancement. Using Japanese university students learning English, he compared three different types of instruction: interaction enhancement with form-focused debriefing (IEF), interaction enhancement with meaning-focused debriefing (IEM), and no interaction enhancement with meaning-focused debriefing (NEI). Interaction enhancement involved providing students with scenario’s that were intended to create contexts for using indefinite articles. During the role-play, the teacher would enhance the interaction by providing implicit negative feedback (i.e.: repetition requests and output modification). During the form-focused debriefing, the students received explicit instruction in how to use the indefinite article, while the meaning-focused debriefing discussed the success of the interaction. Progress was assessed by means of oral story retelling, oral and written picture description, and a grammatical judgement task. The results show that the IEF group scored significantly higher on all four measures than the IEM and NEI group. In other words, the group with most explicit knowledge also showed most implicit progress. However, it is important to point out that the IEF group received more exposure to the target structure, because of the differences in debriefing. Thus, the advantage found for the IEF group cannot safely be attributed to the fact that they had more explicit knowledge.

VanPatten and Sanz (1995) intended to assess the effectiveness of Processing Instruction, a specific type of explicit form-focused instruction that hopes to
**Table 2.3:** A summary of FFI studies addressing the interface between explicit and implicit knowledge

<table>
<thead>
<tr>
<th>Study</th>
<th>Subjects</th>
<th>Target structures</th>
<th>Research design</th>
<th>Measure of L2 development</th>
<th>Outcome</th>
<th>Interface evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bienfait (2002)</td>
<td>41 Dutch SL subjects (age 13-17)</td>
<td>8 different structures</td>
<td>Exp. Instr., control group; Developmentally ready (DR) group; Developmentally unready (DU) group.</td>
<td>I.M.: Oral production in formal and informal tasks; E.M.: not assessed</td>
<td>When DR, students show significant progress, irresp. of the kind of instruction or the kind of target structure</td>
<td>No advantage of explicit over implicit instruction.</td>
</tr>
<tr>
<td>Murano (2000)</td>
<td>91 EFL university students</td>
<td>Definite and indefinite articles</td>
<td>Interaction enhancement combined with explicit rule-provision or with meaning-focused instruction; Control group.</td>
<td>LM.: Oralstory description; oral and written picture discription; E.M.: Grammaticality judgement task (GJ)</td>
<td>On all tasks: exp. FonF &gt; imp. FonF &gt; control; Exp. FonF impacted significantly on all tasks, Imp. FonF primarily on oral tasks.</td>
<td>Explicit instruction significantly outperformed implicit instruction</td>
</tr>
<tr>
<td>Sanz &amp; Morgan-Short (2004)</td>
<td>69 Spanish SL university students</td>
<td>Preverbal pronouns</td>
<td>Four conditions: groups differed according to provision of explanation (E) and feedback (F): [+E, +F] [-E, -F] [+E, -F] [-E, +F]</td>
<td>LM. written video retelling task; E.M.: Sentence completion</td>
<td>Significant progress from pre- to posttest for all four conditions</td>
<td>No advantage of rule provision and/or explicit feedback groups over implicitly instructed group.</td>
</tr>
<tr>
<td>Study</td>
<td>Participants</td>
<td>Data Collection</td>
<td>Instruction</td>
<td>Results</td>
<td></td>
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<tr>
<td>VanPatten &amp; Sanz (1995)</td>
<td>44 Spanish SL university students</td>
<td>Preverbal pronouns</td>
<td>Explicit instruction (Processing instruction); control group</td>
<td>Instruction significantly affected the scores on both I.M. and E.M. The only exception was the oral I.M. measure. Explicit instruction significantly improved written L2 proficiency, but not oral proficiency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Williams and Evans (1998)</td>
<td>33 ESL university students</td>
<td>Participial adjectives; passives</td>
<td>Explicit instruction, Implicit instruction, Control group</td>
<td>On both structures, the experimental groups did better than the controls on I.M. and E.M. measures, except for I.M. passives (no group differences) No advantage found for explicit instruction over implicit instruction.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a – I.M.: implicit measure; E.M.: explicit measure
b – Sentence completion tasks may not be a valid measure of explicit knowledge in that they do not necessarily invite the L2 learner to use their explicit knowledge.
facilitate input processing. They used university students learning Spanish as a foreign language, and compared a processing instruction group with a no instruction group. In this study, the object of study was again the Spanish preverbal pronoun. Four measures of progress were used: an interpretation task, a sentence completion task, a structured interview and a storytelling task. In addition, the latter three were administered in both oral and written mode. They found the processing instruction group to outperform the no instruction group on all measures. Another interesting result was that the effect of their instruction tended to be stronger in the written mode than in the oral mode. However, again, one cannot exclude the possibility that differences in effects between both groups were due to differences in exposure. In fact, in this case, it seems very likely that they are to a considerable extent, as the processing instruction covered two full schooldays focusing on the target form, during which the no instruction group performed regular classroom activities.

Williams and Evans's (1998) study expressly addressed the issue of whether the kind of grammar structure makes a difference in instruction. Their learners of English as a second language (university students) were divided into three conditions: one that received an input flood, which is an implicit type of instruction; another group received an input flood plus explicit rule explanation; and there was a control group. The instruction targeted participial adjectives of emotive verbs (e.g., interested/interesting) and passive constructions. However, in this case, only the passives are of interest, as they used an explicit and an implicit measure for this structure only (sentence completion and narratives, respectively). It should be noted that the narrative task was not a true free response task, as the subjects were asked to describe pictures and were supplied with a particular phrase that elicits the passive to start off the narrative. Their results show that the control group hardly obtained any progress. Both instructed groups did, but there were no significant differences between the two on the narrative task. The flood plus instruction group did obtain more progress on the sentence completion task, but this difference was not significant. Thus, this study also does not suggest an interface between explicit and implicit knowledge. Interesting, though, is that both experimental groups outperformed the control group on the narrative. Apparently, the type of instruction did not make a difference, as long as students received input. Also, it underscores the importance of keeping the amount of exposure to the target structure equal.

Bienfait’s study (2002) was special in that she took great pains to operationalize developmental readiness. She compared progress of two groups: a group that received explicit FFI with a group that continued their normal
classroom activities, and she further differentiated her subjects (13 to 17 year old learners of Dutch as a second language) according to whether they were developmentally ready. Progress was measured by means of a formal and an informal production task at different points in time, both orally administered. The formal task required students to describe a comic strip, and students were expressly warned that their output needed to be as accurate as possible. The informal task consisted of informal conversation. Students were considered developmentally ready for one of the eight target structures monitored, if there were differences in correct use between the two tasks. Bienfait found that there were no differences in success between the two conditions for students that were developmentally ready. In both conditions, significant and equal progress was obtained on both the formal and informal tasks. Students that were developmentally unready did not progress on either task. In a delayed post-test, one month later, still no progress was observed, while the ready students continued to perform well. Because of these findings, Bienfait concluded that there is no added value to teaching grammar explicitly; the stage of development rather than the nature of the instruction is the critical factor for growth of grammatical proficiency (2002, p. 251). This study, then, also did not find explicit instruction to be superior to implicit instruction. It should be pointed out that the study did not include an explicit knowledge test, and the groups compared may simply not have differed in their explicit knowledge of the target structures.

Reviewing the research, then, one must conclude that the evidence for an interface between implicit and explicit knowledge is very slim. Mostly, FFI is found to be effective, but none of the studies allow for the interpretation that explicit instruction is superior in promoting implicit grammatical development. Either there were no differences in explicit knowledge between the groups compared, or there were substantial differences in exposure to the target structure. Three findings are important. The first important finding is Sanz and Morgan-Short’s finding of the lack of difference in explicit knowledge between their conditions, despite differences in the explicitness of the instruction. This means that students can develop explicit knowledge on their own, and underlines the importance of assessing explicit knowledge in addition to implicit knowledge. The second interesting finding is the difference in effects observed between oral and written tasks by VanPatten and Sanz. Apparently, effects of instruction are larger in the domain of writing, or appear first there. And the third finding of importance is the finding by Williams and Evans that both experimental groups outperformed the control group, which indicates that amount of exposure, rather than the nature of the exposure, is of crucial importance.
2.4.5 Developmental readiness, structure complexity and ID’s

This subsection reviews studies that have compared explicit and implicit kinds of instruction in relation to the variables that have surfaced in the interface debate as potentially moderating the effectiveness of FFI: developmental readiness, the type of grammar structure taught, and individual differences (IDs). The studies selected for review were those that have assessed any of these aspects in relation to explicit and implicit kinds of instruction, irrespective of the kind of measurement used. The intention is examine how these factors interact with the success of different types of FFI.

FFI studies that expressly address the issue of developmental readiness are rare. The only FFI study in which developmental readiness prominently featured has already been discussed in the previous section: Bienfait (2002). Using two oral production measures that varied in formality – and using differences in performance between these two measures as an indication of readiness, she found that her young learners of Dutch as a second language obtained progress only if developmentally ready. Once they were ready, receiving explicit instruction did not make a difference as compared to students that continued their normal classroom activities. Thus, this study clearly suggests that explicit knowledge about the second language does not offer advantages to second language learners.

Bienfait not only addressed the issue of developmental readiness, she also monitored the development of functionally simple structures as opposed to functionally complex structures. Comparing composite scores of all simple structures with composite scores of all complex structures, she found no differences in progress between the two types of structures as tested by the formal task. However, students that were developmentally ready and received explicit instruction obtained more progress in meaningless structures as measured by the informal task.

A number of other studies have investigated how the nature of grammar structures impact upon the effectiveness of different kinds of instruction. Studies by DeKeyser (1995), De Graaff (1997a), and Robinson (1996) have also addressed the issue by comparing the effects of different types of FFI on the acquisition of contrasting grammar structures. Individual differences have not featured prominently in FFI research, although they are commonly hypothesized to affect language learning. Factors such as attitude, age, and L1 background have attracted a considerable amount of attention, but researchers have never investigated these in relation to different kinds of instruction. Attempts are generally made to control for their potential influence, but they do not often figure as explaining variables in FFI research. Aptitude has featured in two
The nature of the grammar structure was investigated by DeKeyser (1995), focusing on structure reliability. He tested the effectiveness of an explicit-deductive approach vs. an implicit-inductive approach for simple categorical (reliable) and probabilistic (unreliable) rules of a miniature artificial language consisting of 98 words. Both structures were morphological rules. The instruction was based on 124 stimulus sentences, and advance rule explanation was provided to the students in the explicit condition. Progress was measured by means of a grammaticality judgement test and a production test (respond in one sentence to a picture). DeKeyser reported that the explicit approach works better for categorical rules in new contexts. In contexts that were also used during the instruction, there were no differences. The implicit approach was found to be more effective for the probabilistic rules. DeKeyser sees theoretical implications: the internalization of unreliable rules may depend on implicit memory-based learning; while reliable rules are analysed and internalized by means of explicit rule-based learning. But the differentiated effect of explicit instruction in old and new contexts also suggests that L2 learners tend to use their exemplar-based knowledge before reverting to their rule-based knowledge.

One of the goals of Robinson (1996) was to investigate Krashen’s (1981) claims that complex rules can only be learned unconsciously. He monitored the learning of a simple and a complex syntactic rule in relation to four different types of instruction. The instruction involved the presentation of 40 stimulus sentences to which the students had to respond to questions about these stimuli appropriately. In the implicit condition, students were asked whether particular words had appeared in the stimulus; the incidental condition required answering text comprehension questions; in the rule-search condition, students were asked whether they already had ideas about the rules sought for; and in the instructed condition, students had to respond to metalinguistic questions about the stimulus. Progress was measured by means of a grammaticality judgement task. Robinson did not find support for Krashen’s claim: there were no differences in performance on the complex rule between the instructed, incidental, and implicit conditions. Students in the rule-search condition did not perform very well. With respect to the simple rule, his findings are similar to those of DeKeyser: the instructed condition was found to outperform the other three conditions.

Contrary to Robinson’s findings, De Graaff (1997a) hypothesised that explicit instruction is especially valuable to the acquisition of complex rules. The argument is that simple rules can be noticed spontaneously, while explicit FFI
may help noticing and analysing complex rules. Complexity was operationalized as: “the number of different formal or functional grammatical features that contribute to the specific form of a target structure and the specific function it performs”. De Graaff examined the acquisition of Experanto and Spanish by Dutch university students, contrasting two types of instruction that had a communicative focus. In one condition, students were provided with additional rule explanation and feedback. Using grammaticality judgements and sentence completion tasks, De Graaff found his hypothesis confirmed only for Spanish.

Another hypothesis of De Graaff’s study pertained to the potential difference in effectiveness of FFI with respect to morphological and syntactic structures, arguing that morphological rules can be internalized as exemplars, while syntactic rules can only be acquired by means of rule-based learning. The latter type would benefit from explicit instruction. De Graaff found the opposite, though. Another hypothesis of De Graaff’s study is related to IDs and FFI. De Graaff hypothesized that aptitude – measured by means of a Dutch versions of the paired associates test and the grammatical sensitivity test from the MLAT (Carroll & Sapon, 1959) and an additional test assessing the ability to infer word meanings – would affect performance in both conditions equally. Using a composite aptitude score, he found this hypothesis confirmed.

Another study investigating the relation between FFI and aptitude was conducted by Robinson (1995; and reprinted in 1997). This study actually addresses Krashen’s no interface claims. Using the paired associates test and the grammatical sensitivity test from the MLAT (Carroll & Sapon, 1959), Robinson investigated rule-learning of a simple and a complex rule by ESL learners under four different circumstances: implicit, incidental, rule-search and instructed learning. Knowledge of the rules was measured by means of a grammaticality judgement task. Robinson found support for Krashen’s claim that aptitude predicts explicit types of learning. There were no correlations found between the two aptitude measures and the scores obtained by students in the incidental learning condition, while both components were related to both simple and complex rule scores for students in the instructed condition. Other more difficult to interpret findings were the correlations between grammatical sensitivity test scores with both simple and complex rule scores obtained by implicit learners. Robinson speculated that these learners may have been engaged in conscious analysis of the rules.
2.4.6 Conclusion

The goal of this section was to evaluate the extent to which FFI research has provided insights into the interface debate. For a number of reasons, the amount of studies that address this issue is small. First of foremost, FFI studies need to incorporate measures of implicit knowledge, which were defined in 2.4.2 as tests that assess learners’ ability to use the second language in spontaneous situations of use. Most FFI studies have measured progress by means of tests calling on explicit knowledge: tests that assess knowledge of the target structure in isolated contexts and expressly call on knowledge about the language. Another important requirement of FFI studies wanting to address the interface issue is that such studies should compare explicit and implicit types of instruction, preferably in relation to both implicit and explicit progress.

Evidence for an interface between explicit and implicit knowledge has been sought by discussing R. Ellis’s (2002) review of FFI studies that have used implicit measures of progress, and by surveying studies that meet the most important design requirements for addressing the interface issue. Ellis’s review has borne out that FFI mostly promotes implicit grammatical development. He also suspects explicit types of instruction to be more effective than implicit instruction. His review does not warrant that conclusion, though, as most studies evaluated the impact of implicit types of instruction, and when explicit types of instruction were used, these provided ample occasion for implicit learning. An interesting finding is that FFI seemed to be more effective for morphologic and formulaic structures than for syntactic structures. The studies by Bienfait (2002), Muranoi (2000), Sanz and Morgan-Short (2004), VanPatten and Sanz (1995), and Williams and Evans (1998) – studies that in design address the interface issue – also do not provide much evidence for an interface between explicit and implicit knowledge. The studies by Muranoi (2000) and VanPatten and Sanz (1995) did find explicit instruction to be more effective than its control, but this advantage may well be caused by differences in exposure to the target structure. In fact, keeping the amount of exposure equal has proven to be an important design requirement for addressing the interface debate.

The relation between the effectiveness of FFI and developmental readiness, the type of target structure and IDs - issues that all feature in the interface debate, does not provide an overall clear-cut picture. Bienfait’s study clearly suggests that developmental readiness moderates the potential power of FFI. However, even developmentally ready students did not benefit from explicit instruction in her study, except for complex structures. The findings reported by DeKeyser (1995), Robinson (1996), and De Graaff (1997a) with regard to the type
of grammar structure taught and using explicit measures progress, seem contradictory. DeKeyser and Robinson report advantages for explicit instruction with reliable or simple structures, while De Graaff finds explicit instruction to promote one of the complex structures in his study. Finally, De Graaff (1997a) and Robinson (1995; 1997) suggest that aptitude as measured by the paired associates test and the grammatical sensitivity test affects explicit learning. Interestingly, as both report correlations between aptitude and progress scores obtained by students in explicit and implicit learning conditions, this conclusion is valid irrespective of the kind of instruction received. However, only explicit measures were used, which means that it remains unclear how these measures of aptitude affect the development of implicit knowledge.

### 2.5 Summary

The practical value of explicit knowledge to the development of second language proficiency has been the central concern in this chapter. Theoretically, this concern is addressed by the interface debate. Three different positions have been identified, each proposing a different role for explicit knowledge in the course of second language proficiency development. The strong interface position stresses automatization processes, and supposes that explicit knowledge can become implicit through practice and automatization. Consequently, this position attributes a relatively large role to explicit grammatical knowledge, and explicit types of instruction should prove to be more efficient in promoting implicit grammatical knowledge than implicit types. The weak interface position similarly argues that there can be an interface between explicit and implicit knowledge, but posits constraints: those grammatical structures that develop according to a natural order of acquisition can be taught effectively only if the instruction matches the L2 learner’s stage of acquisition. Finally, the no interface position posits that explicit and implicit knowledge are two separate knowledge systems, resulting from two independent mechanisms of learning. In this view, the contribution of explicit grammatical knowledge to the development of implicit knowledge is severely limited: only when teaching explicit knowledge works to promote implicit learning processes may explicit instruction positively affect L2 proficiency development.

The interface issue has been critically evaluated in two ways. First, the nature and use of implicit grammatical knowledge has been discussed, and related to how it is learned. Implicit knowledge has been defined in terms of an associative
network of chunks or exemplars which results from exposure to frequent (co-)occurrence of structures. A grammar emanates when language learners start to replace lexically specific chunks with open class elements that allow slotting in other lexical or schematic elements. Three stages can be identified in this process of developing and learning to use a grammar. The stage of lexicalization refers to the internalization of exemplars, and the mechanism that takes care of lexicalization is noticing. The second stage, syntacticalization, refers to the process of abstracting grammar from exemplars, and occurs entirely subconsciously. It has been argued, though, that the resulting grammar may not be used to compute sentences from scratch in real-time communication, because processing demands may be too high. Rather, larger stretches of language are relexicalized and strung together so that communication requires little coding effort. The development of this network of chunks is slow and gradual, and requires a sufficient amount of exposure and ‘habit-formation’. Strong, rule-like associations are not established overnight, and the ability to use the L2 in an – at least seemingly – algorithmic way is similarly not established overnight.

In order to assess the possibility of an interface between explicit and implicit knowledge, the nature, use and learning of implicit grammatical knowledge has been contrasted with explicit grammatical knowledge. The latter was defined as declarative knowledge; and it is seen as the result of a deliberate attempt to understand the rules of the L2. It is best characterized as an explicit, verbalizable, and not necessarily correct, understanding about the second language. If implicit knowledge is indeed best conceived of as an associative network of chunks – as has been argued in this chapter, it is difficult to see how explicit knowledge could convert into implicit knowledge. The conclusion is that there is little theoretical scope for an interface between explicit and implicit knowledge. The value of explicit instruction probably lies in the provision of exemplars triggering implicit learning processes. There is nothing to suggest, however, that exemplars cannot be provided implicitly just as effectively.

The second way this chapter has addressed the interface issue is by investigating the extent to which FFI research has provided valuable insights. A close inspection of the research also does not warrant a theory of L2 proficiency development that allows for the conversion of explicit knowledge into implicit knowledge. Surely, there is plenty of evidence that FFI, especially of the explicit kind, leads to explicit knowledge. Similarly, there is also evidence that FFI leads to implicit knowledge. Not many studies have been conducted that clearly address the interface issue. However, those studies that do contrast explicit and implicit types of instruction and measure implicit progress provide little to suggest that
explicit types of FFI have a larger impact upon the development of implicit knowledge than implicit types of instruction, which would be predicted by the weak and strong interface positions. If anything, they provide evidence for the no interface position, in that exposure to the target structure is found to lead to acquisition irrespective of the kind of exposure, and more exposure seems to lead to more acquisition.

An issue that consistently surfaces in the interface debate is the notion of developmental readiness. There is a possibility that explicit knowledge can only convert into implicit knowledge if the instruction is properly timed. The necessity to time would be caused by language developing according to a natural order of acquisition: instruction should match the stage of acquisition in a language learner is at. The views of language acquisition outlined in this chapter do not exclude this possibility. Language acquisition has actually been described as staged acquisition process. Thus, the development of a particular limited scope pattern most likely depends on whether the L2 learner possesses a sufficient amount of related exemplars, and schematic constructions can be developed only by virtue of the presence of particular limited scope patterns. How this works out for individual structures depends on the nature of these structures, and the extent to which they are interdependent on other structures. One study by Bienfait indeed demonstrated the importance of properly timing the instruction. However, even when properly timed, she did not find explicit instruction to be superior to implicit instruction.

An aspect of language acquisition that may similarly obscure the presence of an interface between explicit and implicit knowledge, is that successful FFI may depend on which structure was taught. Differences between the teachability of grammar structures have been hypothesized for a number of reasons, but none of them convincingly. It has been argued in this chapter that acquisition of different structures of grammar should in principle follow the same trajectory from exemplars to constructions. Differences may nevertheless exist because of differences in hierarchical depth and differences in interdependence. There is indeed ample research showing differentiated effects according to the type of grammar structure taught, but a comparison of such findings leads to a fuzzy picture, and pinpointing which characteristics cause differentiation is difficult. Another important issue is that such research has tended to use explicit measures of grammatical development. Consequently, very little can be said about the interaction between the nature of the instruction, the nature of the grammar structure, and L2 proficiency development.
A final issue is that individuals may differ in their ability to successfully exploit explicit knowledge to the benefit of implicit learning. In short, an interface may exist only for some learners. Aptitude is the most important determining candidate. Recent developments in aptitude research suggest that different cognitive abilities underlie different aspects of L2 learning. Robinson (2001) has argued for a distinction between a number of aptitude complexes, one of which being aptitude for explicit rule learning. Other complexes he defines are aptitudes for incidental learning via oral and written content, and aptitude for focus on form. The implication is clear: the cognitive abilities underlying explicit L2 development are different from those underlying implicit L2 development. As such, Robinson’s theory provides another argument for regarding explicit and implicit learning as two separate systems. Studies that have investigated the interaction between aptitude and FFI have only used explicit measures of progress, and found that aptitude predicted progress regardless of the kind of instruction received.

All in all, this chapter has demonstrated that the role that explicit knowledge should play in second language learning programmes is far from clear. Nevertheless, most agree that explicit instruction should be part of such programmes (Bienfait, 2002: p. 3). One can wonder, though, on what grounds this claim is made. For one thing, our knowledge of how second language proficiency develops is insufficient to make such a claim. In fact, recent developments seem to suggest that learning to use the second language grammar in a rule-like fashion is not a matter of learning to use algorithms correctly. A question of considerable importance is therefore how L2 learners start to make use of a particular grammar structure, and how they develop the ability to use them in a seemingly rule-like way. Another reason to be careful with claims about the role of explicit knowledge is that FFI research shows a clear bias towards measuring progress by means of explicit knowledge tests. As a result, our knowledge of the role of instruction on L2 proficiency development is limited, and research is needed to examine how different types of FFI affect explicit and implicit measures of grammatical progress, and whether instructing explicit grammatical knowledge facilitates implicit grammatical development. Finally, there are other factors that may seriously undermine any positive contribution of explicit knowledge. Developmental readiness, structure complexity, L1 background, and differences between individuals in the ability to make use of explicit knowledge might be constraining factors; the question that rises is how
these factors interact with different kinds of instruction and the development of L2 proficiency. These are issues that this study intends to address.