

THE NATURE OF EXPLICIT KNOWLEDGE IN FOREIGN LANGUAGE LEARNING:
GRAMMATICAL JUDGMENTS, WRITTEN PRODUCTION, AND ARTICULATION OF
RULES AND PRINCIPLES OF VERB ASPECT AMONG SECONDARY SCHOOL SPANISH
LEARNERS

by

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(Under the Direction of Donald Rubin)

ABSTRACT

Previous research on second language learning indicates that explicit knowledge may foster competence in a foreign language; however, language learners have difficulty articulating such knowledge. For native speakers of English, perfective and imperfective verb aspect present particular obstacles, since they are not grammaticalized in English. This study investigated the contents of third- through fifth-year secondary school Spanish learners' explicit knowledge of preterite and imperfect. That knowledge was characterized by either (1) abstract principles, (2) teacher and textbook rules of thumb, or (3) student-generated rules. It also examined the relation of that explicit knowledge to ability to produce preterite and imperfect forms in timed and untimed writing. Participants completed a computer-administered preterite and imperfect grammatical judgment test that was story-based. The story was presented in English with preterite and imperfect verb judgment choices given in Spanish. Participants recorded oral rationales for their aspect choices on the judgment test and rated their confidence in their judgments. Subsequent production tasks included in-class timed and out-of-class untimed writing. Knowledge of teacher and textbook rules was the best predictor of learner competence in grammatical judgment. It was not until the fifth year of study that a knowledge of more

abstract aspectual principles affected performance. Contrary to previous research, students at all levels of study displayed abundant explicit knowledge of perfective and imperfective aspect. Teacher and textbook rules were most often invoked. The most frequently recited rules were highly concrete and case specific, regardless of the degree of potential learner exposure to those rules. In both in-class and out-of-class writing, teacher and textbook rules were the best predictor of successful aspectual verb usage. These findings suggest that the teaching of both teacher and textbook rules and aspectual principles is warranted and that explicit knowledge of perfective and imperfective aspect does benefit learners in competence and production.

INDEX WORDS: Foreign language acquisition, foreign language education, perfective and imperfective verb aspect, preterite and imperfect, grammatical judgment test, explicit knowledge.

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DEDICATION

This dissertation is dedicated to my lovely wife, Sidney A. Tucker, without whose love and support I could never have finished. Thank you for your patience as well as for all the little ways (like buying me ice cream) that you showed me you were rooting for me and that you would see me through. I will also never forget the countless hours you spent proofreading and helping me at the end. You are truly a God-send in my life, and you proved it once again in this long process. I love you!

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CHAPTER 1

INTRODUCTION

Background to the Problem

Since World War II a fierce debate has raged about the value of explicit grammatical knowledge to instructed second and foreign language learners, that is, learners who are receiving some type of formal instruction in the language (N. Ellis, 1993). Grammatical knowledge is generally classified as either explicit or implicit. Explicit knowledge is knowledge that is abstract, analyzed and that can be verbalized. It is knowledge of which the learner is consciously aware (Bialystok, 1981; R. Ellis, 1993). Knowing the mechanics of how something is done is considered explicit knowledge (N. Ellis, 1993). A knowledge of the rules of chess is an example because of the possessor's ability to verbalize abstracted rules that govern the game. Implicit knowledge, on the other hand, is knowledge that the learner is not aware of and therefore cannot verbalize (Bialystok, 1981; R. Ellis, 1993). It is knowing how to do something without being aware of the mechanisms or processes involved (N. Ellis, 1993). Walking is an activity of which we have implicit knowledge. We know how to do it but don't understand how it is that we are able to do so.

A survey of teaching methods of the past sixty years shows that the pendulum has swung between explicit or direct teaching methods and implicit teaching methods any number of times. At different points researchers and educators have reasoned that explicit instruction and the explicit knowledge it engendered did not lead to or facilitate implicit knowledge among instructed learners, which many saw as the ultimate determinant of native-like proficiency. On

the basis of this understanding, direct teaching methods were discarded and more implicit teaching methods were implemented (N. Ellis, 1993).

The issues of implicit versus explicit knowledge and direct instruction are not as relevant to the language learning of native speakers and immersive learners given that they learn the language without much explicit knowledge. But as for instructed language learners, in the past twenty years, research has concluded that direct instruction in general is more beneficial to language learners than naturalistic exposure alone (Long, 1983) and that explicit instruction in general is more beneficial than implicit instruction (Norris and Ortega, 2000). Previous research has also shown that that instructed learners in general but especially beginners have a difficult time restating grammatical rules (Green and Hecht, 1992; Sorace, 1985). There also appears to be little correlation between an explicit knowledge of rules and their correct application (Alderson, Clapham and Steel, 1997; Green and Hecht, 1992; Hulstijn and Hulstijn, 1984; Han and Ellis, 1998; Seliger, 1979;).

Perfective and Imperfective Aspect

Perfective and imperfective aspect is a notoriously difficult grammatical topic that has not been examined in depth in relation to the value of explicit knowledge to learners. Aspect in general locates an event in terms of its development across time, while tense locates an event at a particular point in time (Comrie, 1976). Perfective aspect refers to the totality of an event viewed from the outside. Imperfective aspect represents the event or situation from the inside, concerning itself with its internal development (Shankara, 1999).

In Romance languages, the semantic differences between perfective and imperfective aspect are expressed through two alternate forms that do not exist in English. In Spanish these alternate forms are the preterite and the imperfect. The preterite and the imperfect were once

thought of as two separate tenses but are now considered different aspects of the Spanish simple past (Bull, 1965). In English a variety of verbal forms are used to capture the distinctions expressed by the preterite and the imperfect (Hill, 1984). The imperfect verb form *visitaba* could be translated into English as *was visiting*, *visited* or *used to visit* depending on the perspective of the speaker and the context. The differences between how perfective and imperfective aspect is expressed in English and how it is expressed in Spanish make the preterite and the imperfect difficult for native English speakers studying Spanish (Hulstijn, 1995). Indeed, this topic is the bane of Spanish foreign language pedagogy. With the exception of the subjunctive, the preterite and the imperfect have generated more discussion than any other grammatical topic in Spanish (Whitley, 1986).

Adding to the inherent difficulty of the preterite and the imperfect for native English speakers is the lack of a well-defined set of rules that govern their use. The concept of a language “rule,” like the concept of “grammar,” is evoked with varying meanings (e.g., Hartwell, 1987; Seliger, 1979). This study is concerned mainly with “pedagogical rules” which teachers convey to students in order to induce more native-like performance and which may or may not conform to either “linguistic rules” or “mental rules.” Because of the absence of a one-to-one conceptual and linguistic correspondence between the preterite and the imperfect in English and Spanish, the rules used to explain their functioning to students vary, sometimes greatly, from teacher to teacher and textbook to textbook in terms of their conceptualizations and their wording. Most of these rules take the form of rules of thumb or prescriptive rules.

In the past few years there has been a call for learners of Spanish to study aspectual principles, instead of these many varied case rules of thumb and prescriptive rules, in order to better understand the differences between the type of perfective and imperfective aspect

expressed by the preterite and the imperfect (Frantzen, 1995). Prescriptive rules and rules of thumb are case specific, being governed by the immediate linguistic context. For example, a prescriptive rule might dictate “when you see the words *ayer*, *el año pasado* or *el verano pasado*, you generally use the preterite.” Many of these prescriptive rules and rules of thumb are considered half-truths because they are not always reliable indicators of use. Aspectual principles, in contrast, attempt to capture the linguistic underpinnings of the preterite and the imperfect and are therefore thought to be a better teaching tool (Frantzen, 1995). The aspectual principle that corresponds to the prescriptive rule about *ayer* and so on, stated above, is that the preterite is concerned with the completion of an event or state. A survey of commonly adopted textbooks reveals a mix of aspectual principles and prescriptive rules and, at times, combinations of the two (Frantzen, 1995).

Although research on explicit knowledge of aspect is sparse, a few items involving perfective and imperfective aspect were incidentally included in some of the studies focusing on implicit and explicit knowledge. One study (Green and Hecht, 1992) found that Spanish learners’ explicit knowledge of rules of perfective and imperfective aspect was particularly weak, that they had a very hard time articulating correct aspect rules. The researchers classified aspect rules as “hard rules” because of the difficulty the learners had producing them. The number of aspectual items examined in this study was very small, though. Another study (Sorace, 1985) included imperfective and perfective aspect questions in an examination of learners’ knowledge of rules but did not analyze those questions separately.

Statement of the Problem

Previous research has concluded that instructed learners have difficulty articulating language rules in general (Alderson et al, 1997; Green and Hecht, 1992; Han and Ellis, 1998;

Seliger, 1979). It has suggested that this phenomenon is especially pronounced for rules related to aspect (Green and Hecht, 1992). Additional research that is deliberately, rather than incidentally, focused on knowledge of aspect is needed to confirm these suppositions, though. Additionally, basic questions persist as to the content of instructed learners' explicit knowledge in general, to the form that it takes. No study has given a sufficiently detailed account of the nature or content of instructed learners' explicit knowledge; research has provided us with no detailed description of what it is that learners actually know in an explicit way.

These questions concerning both the extent and content of learners' explicit knowledge seem particularly germane to perfective and imperfective aspect, given that learners are exposed to different types of explicit knowledge in their classrooms and textbooks, aspectual principles vs. prescriptive rules, and many different prescriptive rules at that. Do learners tend to remember the rules and principles they are taught? Further, are they likely to remember one of these types of knowledge more than the other?

Previous research has also suggested that learners at the beginning stages of language study have a particularly difficult time articulating rules (Sorace, 1985). Is this finding applicable to perfective and imperfective aspect? Do beginning language students have a more difficult time articulating rules related to perfective and imperfective aspect than more advanced language students? Moreover, as learners move through higher levels of study, does their thinking about aspect grow more towards one of these types of understanding---rules vs. principles---than the other? Do both their ability to articulate rules and the contents of their explicit knowledge change, and if so how, as they move from one year of study to the next?

The call for a different understanding of perfective and imperfective aspect (e.g., Frantzen, 1995) begs the questions of the effectiveness and usefulness of these two types of

explicit knowledge. While previous research suggests that there is no correlation between explicit knowledge of a rule and its correct application (Alderson et al, 1997; Green and Hecht, 1992; Han and Ellis, 1998; Seliger, 1979), does this supposition likewise hold for the subtle and difficult distinction between perfective and imperfective aspect? Does explicit knowledge related to this type of aspect correlate with a better performance on a test of grammatical knowledge, that is, a test of competence? And, if so, are aspectual principles more beneficial to learners than prescriptive rules? Do learners at different levels of study do better on a test of their knowledge of preterite and the imperfect if they know aspectual principles as opposed to rules of thumb or prescriptive rules, or vice versa?

Of even greater importance to the educator would be information regarding the usefulness for learners' language production of explicit knowledge of perfective and imperfective aspect. Yet no research has addressed this question. To what degree does explicit knowledge of perfective and imperfective facilitate their actual ability to communicate by appropriately deploying perfective and imperfective aspect at different levels of study? Is one of these types of knowledge more beneficial to them in language production involving aspect than the other at different levels of study? Also of interest is the question of whether there exists a link between a particular type of explicit perfective and imperfective knowledge and greater frequency and diversity of perfective and imperfective production.

The questions posed by the gaps in the research are of particular interest to me as a classroom teacher. Any experienced teacher of Spanish can testify that learners have a great deal of difficulty with the rules or explanations for perfective and imperfective aspect and with using this type of aspect. Educators like myself need to be able to make more informed make decisions about the following:

- what kind of explicit knowledge, if any, to teach;
- how much time to spend on each type of explicit knowledge if explicit instruction is warranted

To be able to make these types of decision we will need to know more about

- the extent and content of students' explicit knowledge
- how different types of explicit knowledge correlate with students' accuracy, and
- how useful students' explicit knowledge is to them in language production

To try to answer these questions related to perfective and imperfective aspect, I used the preterite and imperfect in Spanish as the lens through which to focus my study.

Research Questions

- 1) What are the explicit contents of instructed learner knowledge of the preterite and the imperfect for students at different years of study?

Are they more rule-based or principle-based?

How abundant are these contents and do they become more abundant at higher levels of study?
- 2) What are the relations between different types of explicit knowledge about the preterite and the imperfect (aspectual-based vs. rule-based) and accuracy on a grammatical judgment test for students at different years of study?
- 3) What are the relations between different types of explicit knowledge about the preterite and the imperfect and accuracy, frequency and variability in the production of the preterite and imperfect at different years of study?

CHAPTER 2

REVIEW OF THE LITERATURE

Overview

The issues of what instructed learners learn, the kind of knowledge they develop, and its usefulness to them have always been of utmost interest to educators. These subjects become of special interest in the case of a non-rote grammatical concept such as perfective and imperfective aspect in Spanish, particularly for native English speakers. Perfective and imperfective aspect in Spanish refers to morphology that captures semantic distinctions (unfinished vs. finished, habitual vs. momentary, etc.) in a very different way from the way they are captured in English. Because of this difference, imperfective and perfective aspect in Spanish requires a great deal of cognitive restructuring on the part of the native English speakers learning Spanish; they must learn to organize their knowledge of semantic distinctions in completely new ways. This considerable cognitive restructuring is made more difficult by the lack of hard and fast rules that govern perfective and imperfective aspect in Spanish; learners are generally presented with many different ways of viewing these semantic distinctions (e.g., rules of thumb, prescriptive rules, aspectual principles). Thus, the best way to teach perfective and imperfect aspect, the kind of knowledge learners develop of this grammatical concept through the restructuring process, and their knowledge's usefulness to them are of great interest to both the classroom teacher and theoreticians.

In second and foreign language learning, grammatical knowledge is generally agreed to be stored both implicitly and explicitly (Bialystok, 1981; R. Ellis, 1993). Briefly stated, implicit knowledge is knowledge that develops apart from awareness of the mechanisms involved in its

development (N. Ellis, 1993). Explicit knowledge, on the other hand, is knowledge that is conscious in nature and analyzable (Bialystok, 1981; R. Ellis, 1993). There has been a longstanding debate about the relationship between these two types of knowledge and in particular the value of explicit knowledge to the instructed second and foreign language learner. Teachers and researchers have long questioned whether the learning process lends itself to the development of explicit knowledge, and if so, if that knowledge aids learners in actual language production (Alderson et al, 1997; Green and Hecht, 1992; Han and Ellis, 1998; Seliger, 1979).

This debate concerning the value of explicit knowledge to instructed learners is reflected in the differing language teaching methodologies that held sway in the last century and the philosophies behind them. Until World War II, the grammar-translation method, which placed great emphasis on deductive learning and explicit instruction, was widely used. The goal of the explicit instruction that characterized the grammar-translation method was explicit knowledge. This approach was based on the notion that explicit knowledge can lead to fluency (N. Ellis, 1993).

The grammar-translation movement was succeeded by a structuralist, behaviorist approach, the audiolingual method, which forbade the teaching of rules. This method had as its goal implicit learning and implicit knowledge development and did not theorize any role whatsoever for explicit knowledge in the development of that implicit knowledge. By the 1960s this method had fallen into disfavor, for it produced speakers who were fluent but whose speech was mechanically flawed (N. Ellis, 1993).

This realization led to a return to more explicit language teaching methods in the form of the Cognitive Code Method, a method that held that knowledge of rules was a prerequisite to their use. As the pendulum swung back in the 70s and 80s, grammar-free programs characterized

the language classroom. But by the late 80s these programs were being criticized for the disappointing abilities of many of their graduates. Calls have been made since then for a return to some form and degree of explicit or direct instruction (N. Ellis, 1993). Yet, there still remain many unanswered questions about the value of explicit knowledge in general as it applies to difficult topics like perfective and imperfective aspect in particular.

I turn now to a more in-depth look at the theoretical construct behind explicit knowledge, what constitutes explicit knowledge, its presumed value, how it is acquired, and what research has discovered so far about the usefulness of explicit knowledge in general. I will also examine the linguistic underpinnings of aspect in general, and perfective and imperfective aspect in Spanish, in particular, the difficulty it poses for native English speakers, different ways learners are taught to think about this grammatical topic, and what research has said about explicit knowledge of perfective and imperfective aspect.

Explicit Knowledge

The Theoretical Construct

The distinction between implicit and explicit knowledge has a long, well-accepted history (Bialystok, 1981). Similar distinctions appear in epistemology and psychology: personal knowledge/objective knowledge (Polanyi, 1958); belief/knowledge (Scheffler, 1965); know how/know that (Ryle, 1949); and figurative knowledge/operative knowledge (Piaget, 1954). R. Ellis (1994) asserts the incontrovertible nature of this distinction. In contrast, Reber (1993) points out that this distinction is not an absolute one. However, he concedes that the differences between these types of knowledge are significant enough for the distinction to be drawn and for it to serve as an important theoretical construct.

Explicit Knowledge Defined

Many of our abilities are dependent on our conscious awareness of how to carry out a certain task, e.g., doing multiplication, playing chess, or using a computer (N. Ellis, 1994). This conscious awareness is explicit knowledge. Explicit knowledge is defined in terms of awareness: it is the conscious mental representations that a learner forms. It is "analyzed," "abstract," and "explanatory" (R. Ellis, 1994, p. 84). Because it is analyzed, this knowledge can be categorized (R. Ellis, 1994) and organized (Bialystok, 1981).

Explicit knowledge is abstract in that "it takes the form of some underlying generalizations of actual linguistic behavior" (R. Ellis, 1994, p. 84) and because it is not bound by contextual constraints (Bialystok, 1981). Explicit knowledge is explanatory in that it can provide information about how grammar is used in conversation (R. Ellis, 1994). Explicit knowledge can explain how something happens apart from that knowledge being applied in actual usage: "Its logical basis is understood independently of its application" (Bialystok, 1981, p. 34).

For knowledge to be recognized as explicit in nature, it must meet three behavioral criteria (Bialystok, 1981). First, the information must be generalizable to other contexts. The consistent use of a particular structure in new contexts would signal the presence of explicit knowledge. Second, an explicit account must be able to justify the use of a particular structure. Third, it must be accompanied by a high degree of certainty about the correctness of the response. Intuition-based choices (implicit knowledge) tend to be accompanied by less certainty (Bialystok, 1981).

The Presumed Value of Explicit Knowledge

When we teach a principle or rule, we cannot be sure that we are teaching knowledge that native speakers actually use, nor does knowledge of principles and rules guarantee error-free language production. Thus, the question of explicit knowledge' s value to learners naturally arises. A meta-analysis (Norris and Ortega, 2000) concluded that explicit instruction is more beneficial than implicit instruction alone.

Additionally, at least some second language theorists have argued that explicit knowledge does play a role in the acquisition of implicit knowledge of language, the type of knowledge necessary for fluent speech. While it has been suggested (Krashen, 1981) that explicit knowledge cannot become implicit knowledge, another theory suggests that explicit knowledge can directly become implicit knowledge through practice (Sharwood-Smith, 1981). A third position is that explicit knowledge can play a facilitative role in the development of implicit knowledge by causing learners to notice grammatical features in the input. This noticing must take place, it is theorized, for implicit knowledge to develop (Schmidt, 1995). In this latter view, explicit knowledge leads indirectly to more native-like implicit knowledge.

The Acquisition of Explicit Knowledge

The development of explicit knowledge does not depend on specialized processes or mechanisms; it is acquired in the same way as most other types of schooled knowledge. The main processes through which it is acquired are memorization and problem solving. Memorization occurs when a learner attempts to commit to memory a particular grammatical feature of the language such as the conjugation of a verb. This process is the same as that used to memorize mathematical formulae or historical dates (R. Ellis, 1994).

Problem solving occurs as input becomes intake. Input is target language samples that learners come in contact with. When input is noticed and committed to short term memory, it becomes intake (R. Ellis, 1994). This process can, for example, take place during a conversation as learners notice some feature of the language and then analyze it in an effort to understand it (Schmidt, 1995). Problem solving and hence explicit knowledge is encouraged by certain types of formal instruction more than others. Examples are the consciousness-raising activities advocated by Rutherford (1988) and R. Ellis (1991). These activities ask learners to analyze and discover for themselves rules governing a certain grammatical feature in specially-structured input.

Empirical Studies on Explicit Knowledge

A number of empirical studies have examined explicit knowledge. Three of these studies (Gass, 1983; Green and Hecht, 1992) tapped learners' competence, that is, their knowledge apart from production, while two others studies (Alderson et al, 1998; Han and Ellis, 1998; Hulstijn and Hulstijn, 1984; Sorace, 1985) examined it both through measures of competence and of language production. Another study (Seliger, 1979) used only production data.

Competence studies. One competence study (Green and Hecht, 1992) reasoned that because teachers and students alike value grammar instruction, research should go beyond the question of whether or not it is beneficial to teach grammar and inquire about the correspondence between the rules teachers teach and the rules students learn, and the ability of students to use the rules they have learned. Three hundred German students of different ages and in different instructional levels of English were asked to correct the error in 12 sentences and then state the rule that applied. A positive correlation between students articulating a correct rule and an accurate correction was found. However, learners on average were able to come up with the

correct rule only 46% of the time, while they produced accurate corrections 78% of the time. The researchers surmised that students were not very adept at restating the rules they had been taught. Additionally, the general lack of exact correspondence between making an accurate correction and being able to state the rule caused the researchers to put in doubt learners' explicit knowledge as the source of the correction.

A second competence study (Gass, 1983) involved 13 intermediate and eight advanced ESL students who were asked to decide if sentences selected from their own writing were grammatical or ungrammatical and to correct the ungrammatical sentences. This study found that students start off with only a general overall sense of grammaticality, knowing that there is a problem with the sentence but not being able to recognize the exact trouble spot. They then proceed from this stage of implicit knowledge to one of explicit knowledge where they are able to analyze and zero in on exactly what is wrong. Gass speculated that this increase in explicit knowledge develops as learners become more proficient with the language: "...[We] have suggested that with an increase in proficiency comes a concomitant increase in explicit knowledge" (p. 286). She even went so far as to speculate that the analyzed component of language is necessary for fluency to develop.

These findings may reflect, though, the conflating of knowledge type with manner of cognitive retrieval (R. Ellis, 1994). Both explicit and implicit language processing are thought to occur along automatic and controlled dimensions of cognitive retrieval (McLaughlin, Rossman, and Mcleod, 1983; Shiffrin and Schneider, 1977). Controlled processing refers to the accessing of knowledge through attention and analysis while automatic processing requires no effort (Bialystok, 1994; R. Ellis, 1994). In this study explicit knowledge may have been associated with only controlled processing and implicit knowledge with only automatic. While it does make

sense to talk about explicit knowledge becoming automatic or proceduralized, this process cannot be equated with explicit knowledge becoming implicit knowledge. What appeared in the study to be implicit knowledge may have, in fact, been explicit knowledge that had become more automaticized (R. Ellis, 1994).

Competence and production studies. One weakness of many of the competence studies is that they measure passive knowledge competence but fail to assay the learner's ability to mobilize that competence for language use or active production. Only a modest handful of studies investigated implicit and explicit issues but in the context of both actual language production and measures of competence. In one study within this category, thirty-two adult learners of Dutch participated in a story retelling task in which their correct usage of two Dutch word order rules, INV (inversion of subject and finite verb in main clause) and VF (placement of the finite verb in final position in subordinate clauses), was measured (Hulstijn and Hulstijn, 1984). Subsequent to the story retelling task, the learners were interviewed individually about the corrections they had made on a 40-sentence correction test they had taken prior to the story retelling task. Only 12 of the 32 respondents demonstrated correct explicit knowledge of INV and only eight of VF. Six of those demonstrated knowledge of both. The authors of the study concluded that "learners with explicit knowledge generally applied the INV and VF rules better than the learners without such knowledge when the scores for all four treatments were combined" (pp. 39-40). And yet gain scores across time indicated that when learners were asked to focus on grammar, there was not a statistically significant difference between the performance of those with explicit knowledge and those without explicit knowledge.

Another study combining production and competence measures involved a beginning and an intermediate group of students of Italian who were given a grammatical judgment test, a

picture depiction task, and an interview (Sorace, 1985). It found, like the Gass (1983) study, a developmental sequence for metalingusitic knowledge, a term defined in the study not only as the ability to talk about grammatical knowledge, as it ordinarily is used, but also as the ability to display grammatical knowledge in grammar-focused activities. The sequence is as follows:

- 1) inability to identify incorrect sentences;
- 2 ability to identify and correct errors;
- 3 ability to verbalize grammatical rules. (Sorace, 1985, p. 248)

Participants started with a generalized sense of grammatical correctness but with greater proficiency, as measured by the number of syntactic structures on two oral tasks, their ability to locate and correct errors improved (Sorace, 1985). They were not able to articulate many rules at the beginning levels of study even though they had been taught these rules explicitly. Articulated rules were but an advanced, specialized form of metalinguistic knowledge. Many of the rules learners articulated were reformulations, expressed in very personalized terms.

Non-beginners who did well on the judgment test also had a high syntactic index; yet there was a negative but non-significant relationship between the metalingusitic index and the syntactic indexes for beginners. Based on this tendency, the researcher surmised that as metalinguistic knowledge grew, so did performance and that this interaction was proportional to increases in proficiency. In other words, explicit knowledge played a role in the development of implicit knowledge. As with the Gass (1983) study, knowledge type (explicit versus implicit) may have been conflated with cognitive retrieval (automatic or not) because language processing type was not taken in consideration.

A related study, designed in part to measure the relation between explicit knowledge and proficiency, involved knowledge of verb complements (Han and Ellis, 1998). The participants

were 48 adult learners of English who were close to the level of proficiency needed to enter most undergraduate programs. After taking a grammatical judgment test and an OPT (Oral Picture Task) over verb complements, they were interviewed about the basis for their answers—intuition or rule—and their knowledge of an applicable rule. Correlations between scores on subsequent tests of proficiency, the TOEFL (Test of English as a Foreign Language) and the SLEP (Secondary Level English Proficiency), and scores on each measure of explicit knowledge revealed that metalinguistic knowledge did not correlate strongly with students' general language proficiency.

Another study of learners' competence and production (Alderson et al, 1997) showed similar results. First-year undergraduates studying French were asked to identify parts of speech such as adjectives and past participles. Subsequent discrete point and more integrative tests revealed only a weak relation between student grammatical knowledge and their language proficiency. The study also showed that students with greater explicit knowledge did not become more proficient in the language at a faster pace.

One study (Seliger, 1979) looked at the relation of verbal explanation to language production. The point was to see if conscious knowledge of a rule or lack thereof was associated in any way with language performance. Twenty-nine monolingual English-speaking children ages three to 10, 11 Spanish- and English-speaking bilingual children ages four to 10, and 15 adult ESL students with various levels of proficiency and from various language backgrounds were shown pictures of objects and asked to produce the name of each object and its correct indefinite article. After the identification task, they were asked to explain the rules that governed their use of the indefinite article. The results were that there was no relationship between a

correct answer and the ability or inability to formulate a correct rule; neither the presence nor the absence of a consciously-verbalized rule was responsible for language production behavior.

Summary of research. This body of research suggests that in general instructed learners find it difficult to reproduce the rules they are taught in class, especially at the beginning stages of language study, and that no direct relationship exists between being able to come up with the correct rule and its application.

Aspect

Aspect is a promising site for investigating explicit knowledge of L2 for the very reason that it is a grammatical feature that learners find difficult, and more needs to be known about explicit knowledge of difficult grammatical concepts. More information about explicit knowledge of aspect could shed light on this type of knowledge for other difficult grammatical topics as well.

Tense vs. Aspect

To understand aspect, one must first differentiate it from tense, the better known and understood of the two verb elements. Tense, as Comrie (1976) put it, ‘relates the time of the situation referred to some other time, usually to the moment of speaking’ (pp. 1 -2). Tense can also relate the time of a situation to an event described in the same utterance (Shankara, 1999). The three tenses found in many languages are present, past and future. In the sentence *John sang yesterday*, the past tense verb form *sang* places the event of singing prior to the moment of speaking. *John will sing* refers to an event that will take place subsequent to the moment of speaking for the verb form *will sing* indicates future time in relation to the present. Some have argued, though, that English has no true future tense since it just tags a present tense verb to an auxiliary (Comrie, 1976).

Aspect, on the other hand, views an event or situation in terms of its temporal structure, “the way in which the event occurs in time” (Shankara, 1999, p. 43), not in terms of its relation to a period of time. This internal temporal structure takes the form of many different temporal distinctions: unfinished vs. finished, momentary vs. durative, active vs. static, and semelfactive vs. iterative, to name a few (Shankara, 1999). The sentences *John sang*, *John used to sing*, and *John was singing*, while all in the past tense, are marked by aspectual distinctions. *John sang* represents completed action, whereas *John used to sing* denotes habitual action; *John was singing* captures continuous action. These sentences differ in relation to situation-internal time or aspectual distinctions, not in relation to situation-external time or tense (Comrie, 1976). They do not relate the time of the event or situation to different external periods of time; all are in the past tense. The differing types of aspectual distinctions can be divided into three primary categories: (1) perfectives and imperfective (2) ingressives, progressives, egressives and resultatives; and (3) semelfactives, iteratives, habituais and frequentatives (Shankara, 1999).

Perfective and Imperfective Aspect

The most important aspectual distinction is the one between perfective and imperfective. This distinction involves different ways of viewing an event. Perfective captures the event from the outside, viewing it as a whole, in a complete state, whereas imperfective captures the event from within, viewing its internal development (Shankara, 1999). In the sentence *John was singing when I entered*, the verb form *was singing* indicates continuousness, without regard to the action’s beginning or end, and thus reflects imperfective meaning; the action is viewed in its incomplete, ongoing development. The clause *when I entered* represents the totality of an event and in that way reflects perfective meaning (Comrie, 1976).

Perfective and imperfective meaning are a function of the speakers' perspective on a situation or the way they chose to focus on an event. The same event can be captured as a perfective or imperfective event depending on the speaker's presentation of the event or situation. Consider the utterances *John read the book* and *John was reading the book when the postman came*. While the two different forms of the verb *to read* both indicate the same basic action, the first sentence focuses on John's reading as a whole and, therefore, is perfective in nature, whereas the second sentence focuses on the middle or imperfected state of John's reading, which was interrupted by the postman's coming (Comrie, 1976).

To a large degree, therefore, mastering verb aspect is a far broader and more subtle task than just learning a set of linguistically-signaled devices like verb conjugations. Rather, to understand aspect is to understand a speaker's conceptualization or presuppositions about the temporal relations among actions. One must have a knowledge of which kinds of temporal relations are more plausible and which are less plausible in the world. One must be able to infer or impute the speaker's communicative and referential intentions. Verb aspect therefore requires knowledge of language pragmatics as much as syntax or morphology. It is no wonder that very often verb aspect is not unambiguously either correct or incorrect, but rather more or less consistent and plausible.

When imperfective and perfective meaning are expressed through special verbal forms in a language, the language is said to have perfective and imperfective aspect. English in general does not grammaticalize perfectivity and imperfectivity; that is, it does not capture that distinction through special inflectional morphology. It, therefore, cannot be said to have perfective and imperfective aspect, even though it can express perfective and imperfective meaning (Comrie, 1976). It expresses perfective and imperfective meaning through derivational

or lexical distinctions (Shankara, 1999). For example, *I sang yesterday at 3:00 with the chorus* and *I sang every day when I was a child* express the aspectual distinction of semelfactives vs. iteratives through lexical items that accompany the simple past tense verb form *sang*.

Preterite and imperfect. In Spanish, contrastively, imperfective and perfective meaning are grammaticalized, through what are called the preterite and the imperfect (Comrie, 1976). These were once thought of as two separate, simple past tenses but are now regarded as two differing aspects of the Spanish simple past (Bull, 1965). In Spanish the verb in the first sentence, *I sang yesterday at 3:00 with the chorus* would be in the preterite (*canté*) and the verb in the second, *I sang every day when I was a child*, would most likely be in the imperfect (*cantaba*). The verb forms themselves perform the same function carried out by the additional lexical items in English. In some languages, perfective and imperfective aspect encompass a number of different aspectual distinctions such as iterative vs. semelfactive; beginning, middle or end; ongoing vs. completed (Shankara, 1999). This is true for the Spanish preterite and imperfect. The preterite is referred to by a number of different names, among them *pretérito definido*. The imperfect is also sometimes referred to as the *pretérito imperfecto*.

The linguistic principles underlying the preterite have been viewed in a number of different ways over the years by linguists. The preterite has been said to express action which occurred at a specific point in time, no part of which extends until to the moment of speaking. It represents actions with a definite beginning or end (Comrie, 1976). It has also been described as capturing an event or situation from some recalled point in the past or from the present. From the recalled point, it shows the action as having ended. From the present, it can indicate only that the action happened at some point before the present moment. It captures all aspects of the past except middleness. Thus, its meaning is varied and is a function of the verb and the larger

context (Whitely, 1986). The preterite is also viewed as expressive of completed action principally, with it occasionally indicating inception (Butt and Benjamin, 1994).

The imperfect is said to capture imperfective aspect, that is, it captures events before they are perfected, while they are in progress (Gili Gaya, 1961). It focuses on the continuous or progressive nature of a situation (Comrie, 1976). Additionally, this process of capturing events in their middle takes places at a point of recall that is fairly unbounded by time (Whitely, 1986). While the imperfect expresses middleness, it also suggests that another event took place or was taking place concurrently (Guitart, 1978). For this reason the imperfect has been called the *copretérito*; it can be the backdrop for another action, often an action expressed in the preterite. The verb in the preterite is in the foreground and is in focus, but the verb in the imperfect is in the background and is not. The imperfect is “*la decoración del drama*” (the decoration for the drama) (Bello & Cuervo, 1941, p. 163). The imperfect is used when the speaker or writer views a situation very close up and cannot get the entire situation into focus (Lunn, 1985).

The sentences *Juan tuvo mucho dinero* (preterite) and *Juan tenía mucho dinero* (imperfect) serve as illustrations of the basic difference between the preterite and the imperfect. While both sentences contain a form of the verb *tener* (to have) and would be translated into English as *John had a lot of money*, the first sentence with the verb in the preterite would imply that at one point in the past that Juan had a lot of money. The state is viewed from outside, in its completeness. The second sentence with the verb in the imperfect implies that he had a lot of money at some focused point in the past. The state of having lots of money is viewed from within, in its ongoingness. The verb form says nothing about the beginning, the end or the completeness of the state. It implies that another state or event was taking place at the same time. While both these sentences most likely would not occur in isolation but would be part of a larger

context that would help to clarify their meaning, the sentences in and of themselves signal different foci based on the aspectual differences expressed through distinct morphology.

While most linguists agree that the imperfect represents middleness, there is not total agreement on what else it might represent or signal. There is even less consensus on exactly what part of an event or situation the preterite captures (Whitley, 1986). This lack of consensus about the linguistic underpinnings of these two aspects is but one indication that the preterite and the imperfect are difficult grammatical concepts for all those involved. Whitley (1986) has said, "With the exception of the subjunctive, no topic in Spanish morphology has aroused more pedagogical and linguistic discussion" (p. 108). Molendijk (1990) speaks to the difficulty involved in the learning of the *passé composé* and the *imparfait* in French, equivalent structures to Spanish's preterite and imperfect. He also addresses what makes these structures difficult for certain types of learners: "those whose native language does not mark in an overt way what distinguishes the *passé composé* and the *imparfait* of French have as a rule great difficulty in using these tenses properly. This is even true for speakers who have acquired a relatively high degree of perfection in French" (p. 21).

English fits Molendijk's criterion. Indeed, for native English speakers to learn the preterite and the imperfect, a whole new way of thinking about the past that also involves the notion of obligatory aspect must be mastered (Stockwell, Bowen and Martin, 1966). Learners must become aware of the form-meaning relationship between differing morphemes and the way in which aspectual differences are organized and expressed in Spanish (Dillard, 1973).

This mastering of a new system of aspectual distinctions is made even more difficult by the explanations about the preterite and imperfect to which learners are exposed. Green and Hecht (1992), in a study of student rule knowledge and use, found that students could not easily

articulate rules related to aspect. They suggest that this difficulty is explained, in part, by the fact that the semantic distinctions that aspect captures “do not allow for exhaustive descriptions” (Green and Hecht, 1992, p. 180). These descriptions most often take the form of rules and principles.

Rules and Principles Defined

There are many different types of grammatical rules. The term *rule* refers to overarching systems that both describe and prescribe in relation to language use. It also encompasses specific subdivisions within the overarching systems that prescribe language use.

Mental rules. One type of rules is those that govern the speech of native speakers of a language. These rules undergird patterns of speech that allow speakers of a common language to understand one another (Faerch, 1986; Hartwell, 1985). It is not necessary that learners be aware of these rules to be able to use them successfully; from the age of five or six speakers use these rules quite well. They are therefore internalized and represent abstract, implicit knowledge (Hartwell, 1985). These have been called mental rules (Faerch, 1986).

Linguistic rules. Linguists, in turn, create rules that seek to capture the basic essence of mental rules. These linguistic rules describe, analyze and formalize language patterns in a metalanguage that is governed by a particular linguistic theory (Hartwell, 1985). They seek to allow for all the utterances that are possible in a language and only those (Faerch, 1986). This task is made difficult by a number of different factors:

synchronic as well as diachronic variation in the language within a community,
degrees of grammatical acceptability; language users own perception of grammatical
ambiguity and synonymy, etc. (Faerch, 1986, p. 125)

These linguistic rules are also referred to as reference, descriptive and scientific rules (Mohammed, 1993).

Pedagogical rules. In classrooms yet another type of rules appear: pedagogical rules. Pedagogical rules are linguistic rules that have been simplified and recast to make them understandable by students (Mohammed, 1993). They are a subset of descriptive rules (Faerch, 1986). The goal of these rules is to cause speakers to produce a particular language form (Seliger, 1979). They attempt, on a simplified level, "to instill someone with the knowledge that native speakers unconsciously have in mind" (Seliger, 1979, p. 360).

Additionally, within the category of pedagogical rules, there exists a specific type of explanation that also falls under the moniker of rules: rules of thumb or prescriptive rules. Prescriptive rules or rules of thumb prescribe what grammatical forms language learners should use in a particular linguistic context. These are rules that have are based on experience and practice and are considered to be generally yet not scientifically accurate (Faerch, 1986). Their application, therefore, is expected to lead generally but not always to a correct usage. An example is when you see the word "*siempre (always)*" you generally use the imperfect.

Principles. Another type of pedagogical rule, as the term has been used in the literature, is principles (Frantzen, 1995). The term *principle* has been used to refer to a type of pedagogical explanation that is broader based; it attempts to get at the underlying concepts. It is, therefore, not case specific as prescriptive rules or rules of thumb tend to be. Principles therefore are fewer in number than rules and are more reliable indicators of usage (Frantzen, 1995).

It has been suggested that neither linguistic rules nor the further simplified form they often take in pedagogical rules are accurate reflections of the abstract, internalized mental rules

that govern native speech (Francis, 1954). This assumption has led many to question, therefore, the value of linguistic and pedagogical rules as aids in learning.

Another type of rules is those that encompass linguistic etiquette. They are often accompanied by an admonition about what one shouldn't say, for example, that one shouldn't use the word *ain't* (Hartwell, 1985). Thus, the term "rules" is used to refer to different overarching systems, some of which describe what speakers of a language do and some of which prescribe what speakers of a language should do. Rules also technically describe specific subdivisions, that are called both "rules and "principles," that prescribe language use within those overarching rule categories.

Textbook explanations

Textbook explanations of the preterite and imperfect often take the form of rules of thumb or prescriptive rules. Some of these rules amount to half-truths, that is, rules that only apply some of the time and are therefore not a reliable indicator of usage (Frantzen, 1995). In a study of preterite and imperfect explanations in 30 college Spanish textbooks and grammar reference books, six different types of half-truths were found, and all but one of the texts had at least one of the six types (Frantzen, 1995).

We also see half-truths in high school textbooks. In the commonly-adopted high school text *Paso a Paso* (Met, Sayers & Wargin, 1996), we find the following statements: 'The imperfect is used with expression such as *generalmente, a menudo, muchas veces, todos los días, siempre* and *nunca*.' In Spanish it is very possible, even probable, to see the following sentence which contradicts that prescribed usage: *Todos los días yo vi un perro* (*Every day I saw a dog*). According to the textbook rule just cited, however, the imperfect form of the verb *ver* (*veía*) should have been used. While it could also be correct to use *veía* in that sentence (depending on

contextual meaning), the fact that the textbook rule does not allow for both makes it both confusing at best and even unreliable.

In *Bravo* (1995), another commonly-adopted high school text, we find “the preterite is used to explain specific actions completed at a specific time.” The following sentence shows why that statement is not always true: *Todos los días yo veía un perro en la calle a las tres* (*Every day I saw a dog in the street at three o'clock*). Seeing a dog is a specific action and three o'clock is a specific time, so according to the rule we should have used the preterite, but the preterite does not have to be used in this sentence; the imperfect may also be used, as it was in our sentence.

Aspectual Principles

In light of the confusion caused by rules of thumb or prescriptive rules, many of which are half-truths, Frantzen (1995) has called for students to be taught the aspectual principles underlying the preterite and the imperfect.

Her list of aspectual principles is outlined below:

- 1) The imperfect is used for
 - a) actions and states in progress at some focused point in the past
 - b) habitual past actions
 - c) repetitious past actions
 - d) anticipated/planned past actions
- 2) The preterite is used to focus on
 - a) the completion of past actions or states
 - b) the beginning of past actions or states (p. 147)

Some aspectual principles like those advocated by Frantzen are also found in some commonly-adopted textbooks. In the textbook *Ven Conmigo* (Humbach & Ozete, 1996), aspectual principles characterize the following statements taken from the text: “The preterite is used to talk about completed actions in the past. To talk about what you used to do ... use the imperfect” (p. 172). While these principles are not exactly the ones Frantzen calls for, they are aspectual principles nonetheless. Thus, learners are exposed to both prescriptive rules and aspectual principles in textbooks, as well as to differing formulations of these rules and principles. Principles and rules are at times even combined as is the case with the explanation found in the textbook *Repaso* (National Textbook Company, 1997): “The imperfect tense is used to express an event or action going on in the past without any reference to its beginning or end” (p. 69). Principles and rules, when not combined, are not presented separately in textbooks and not distinguished from one another in any way.

Operationalization of *principles* vs. *rules*. For the purposes of the study the term *principles* will refer to explanations that are broader in scope than rules. They require more inference on the part of students; that is, students must give more thought to the application of a principle than a rule, because principles get at the underlying concepts behind a grammatical point. For this reason, they are reliable indicators of use. Conversely, the term *rules* will encompass explanations that are more prescriptive, more case specific and because of their case specificity often tend to be half-truths. They are true only part of the time and, therefore, are not reliable indicators of use. Rules, for our purposes here, are all explanations that are either case specific and/or half-truths, regardless of the level of abstraction.

Empirical research on aspectual principles. No studies have examined the efficacy of student use of aspectual principles as opposed to prescriptive rules. Ristvey (1995) conducted a

study in which one group of college students studying Spanish was taught aspectual differences through visual cues while another group was taught prescriptive rules. The group taught through visual cues appeared to perform better on a paragraph assessment of the preterite and the imperfect than the group that had been taught prescriptive rules. No statistical analyses were run on the data, however, so we are left with no reliable picture of a true difference between the performance of the two groups. Additionally, the study did not examine the type of knowledge, explicit or implicit, learners used in the assessment, so one cannot assess whether the type of knowledge taught was the same as the type of knowledge used by the students.

No studies have examined in depth the content of learners' explicit knowledge of the preterite and the imperfect. Such an examination seems warranted given that learners are generally taught both prescriptive rules and the kinds of principles that Frantzen (1995) advocates. More needs to be known about the scope of learners' explicit knowledge of the preterite and imperfect and about the kinds of explanations they are most likely to remember.

Rationale for the Present Study

Very little research has examined questions relating to imperfective and perfective aspect and issues of instructed explicit knowledge. One study concluded that learners must have been using implicit knowledge to identify errors involving aspect because they were able to articulate very few rules relating to the subject (Green and Hecht, 1992). This slight research suggests that instructed learners are not good at remembering aspectual rules, that they do not have much explicit knowledge of those rules. The number of items involving aspect in that study, however, was so small that more research into the extent of learners' explicit knowledge is warranted. In addition, that study did not indicate what type of "rules" learners were able to produce. We know, therefore, little about the nature of learners' explicit knowledge of perfective and

imperfective aspect at different levels, that is, what type of knowledge, aspectual or rule based, they form at different levels. More research needs to be done, therefore, into the exact contents of instructed learners' knowledge. Does learners' explicit knowledge consist primarily of aspectual principles or prescriptive rules, and does this knowledge change at different levels of study? Moreover, how abundant is their explicit knowledge and does it become more abundant as they move into higher levels of study?

Research has also left unanswered the question of the relationship between instructed explicit knowledge and performance on different types of measures. Does the articulation of aspectual-based explicit knowledge or rule-based explicit knowledge result in greater accuracy on both grammatical judgment and discourse production tasks? Grammatical judgment tests reveal what it is that learners know apart from the constraints placed upon them in production; they reveal what they can do, even if they do not always do it (Seliger and Shohame, 1990). The knowledge garnered from a judgment test can give the researcher and educator a better picture of learner competence, of what is possible. The one study that used grammatical judgment tests (Green and Hecht, 1992) and examined issues of explicit knowledge as they relate to aspect did not yield a complete picture of these relationships because of a small battery of aspectual test items. Of yet of even greater practical consideration for the educator is the question of the benefit of instructed learners' explicit knowledge to them in production tasks, such as story writing, at different levels. In particular, to what degree does each type of knowledge facilitate learners' ability to actually communicate using the preterite and the imperfect? Is one more valuable to learners at some levels of learning than at others? Additionally, does knowledge type affect the frequency and diversity of preterite and imperfect production? While these are

valuable questions given the ultimate goal of many language programs of producing fluent language use, they have been neglected in the research.

Given the reported difficulties involved in both second language teaching and learning of verb aspects like the preterite and the imperfect, answers to all the questions posed above may help educators make more informed choices about whether it is advantageous for instructed learners to be formally taught any sort of aspectual principles or rules at different levels and, if so, which of these types of explicit knowledge, aspectual or rule based, to seek to develop at different levels of study based on which type seems to serve instructed learners best at these different levels.

CHAPTER 3

METHODS

Research Site

My research site was a K through 12 private school in a major Southeastern U.S. city. Approximately 1800 students attend. Admission to the school is based on standardized test scores, grades, teacher recommendations and an interview. Because this school is exclusive in its admissions, its students do not represent a cross section of American high school students. Yet the students who participated in the study were not in honors classes, bringing the sample more in line with the national average. The principal of the high school, the Language Department Chair, and the Spanish teachers all supported students' participation in this study. The school thus afforded easy access to a large number of students at different levels of study and the technology necessary to collect a considerable amount of data from each participant.

Participants

Participants were 63 third-year Spanish students, 62 fourth-year Spanish students, and 48 fifth-year Spanish students. The sampling frame comprised all students in levels three, four and five of Spanish at the research site. It was possible to encompass all these students into the sampling frame because their teachers had determined that the research tasks provided students with instructionally-valuable practice in using the preterite and the imperfect. The teachers, therefore, added these tasks to the regular curriculum. The students ranged in age from 14 to 18 and were in grades 9 through 12. The sample included both males and females, and the students were predominantly white. All the students had first studied the preterite and the imperfect in

their second year of Spanish and had reviewed it each year since. The participants were from intact classes at each of the three levels of study. Utilizing intact classes in this study was deemed acceptable and even advantageous because of the need for strict control over test administration procedures and methodological consistency. These controls could not have been ensured if students had not taken the tests as part of an intact class. Moreover, since the study was purely descriptive and involved no experimental intervention, the issue of intact classes would not jeopardize internal validity per se (Campbell & Stanley, 1964).

Parental and student consent were obtained for each participant. In conformity to requirements for informed consent, students and parents were given the option of denying permission for a student's work to be included in the study. Eighteen students, or 9.5 % of all eligible students, failed to return the permission forms, and their work was not included in the study.

Procedures

Four primary sets of data were collected from participants: (1) untimed grammatical judgment tests, (2) oral rationales associated with each of the grammatical judgments, (3) confidence ratings associated with each of the grammatical judgments, and (4) written language productions from which frequencies of verb production were induced. Two types of written language productions were elicited for item #4, above: (4a) timed, in-class writing samples and (4b) untimed writings produced as homework.

All participants at each level of study (3rd, 4th, and 5th year) completed the same untimed grammatical judgment test (see Appendix A) over the preterite and the imperfect. The tests were administered via computer in the school language lab. To assure the stability of its results, the untimed grammatical judgment test was given twice, with a week separating the administrations.

At both administrations participants rated their level of confidence in their preterite and imperfect answers. At the first grammatical judgment test administration students also provided tape-recorded oral rationales for their verb aspect choices.

The grammatical judgment test and oral rationale were followed a month later by two written production tasks. For the first of these tasks participants narrated, using the past tense, an episode of a TV show or a movie of their choice. They were given fifteen minutes during class to complete this task. A second task involved participants' writing, in the past tense, about another episode of a TV show or another movie. They completed this task the same day at home, but with unlimited time, and were asked to focus primarily on grammatical correctness as they wrote.

Grammatical Judgment Test

Theory and Reliability of Grammatical Judgment Data

To ascertain aspects of participants' competence with the preterite and the imperfect, the first task participants completed was an untimed grammatical judgment test. Grammatical judgment tests, both timed and untimed, were conceived as means of discovering learner knowledge, apart from performance (Gass, 1994). They were conceptualized as a window onto language users' competence, that is, what they actually know, without the constraints associated with actual use of that knowledge. The validity of judgment tests as a measure solely of competence has been criticized, however, because test scores have come to be viewed as contaminated by more than just linguistic knowledge. They have been found to reflect factors such as processing constraints, response bias, nature of the target language, and inter- and intra-learner differences as well as learners' knowledge. In short, grammatical judgments are now seen

as a type of metalinguistic performance in which linguistic knowledge and various factors interact (Birdsong, 1989).

Gass (1994) acknowledged that grammatical judgment tests are indeed a type of performance data and argued that as a source of performance data they give us an idea of what is possible and impossible in learners' interlanguage and, therefore, remain valuable.

Another question surrounding grammatical judgment tests is how reliably they measure grammatical knowledge. In one study, advanced and intermediate learners changed between 22.5 % and 45% of their judgments in a test-retest study format (R. Ellis, 1990). In another study with 60 sentences in which four sentences were repeated, all 12 participants flip-flopped their judgments for at least one pair of identical sentences (Birdsong, 1984). The methodology was changed slightly from test to retest, however, in the Ellis (1990) study; one group was given only a subset of the test questions in the retest phase (Gass, 1994). Because indeterminacy in learner knowledge came to be seen as the primary cause for changes in judgments by participants, other response options designed to reveal that indeterminacy were added in subsequent refinements of the methodology. These response options included a 'not sure' choice (Bley -Vroman, Felix, & Ioup, 1988), choices such as 'probably grammatical' and 'probably ungrammatical' (Schachter and Yip, 1990), or a confidence or comparative certainty scale (Coppieters, 1987).

The design which most clearly identified participants' indeterminacy ---and thereby helped to eliminate it as a source of unreliability---first asked participants to judge the acceptability of a sentence containing relative clauses (Gass, 1994). Participants were then asked to rate on a seven-point scale their confidence in their answer. They were given the same test a week later. When data that represented more than a six-point change from test to retest were eliminated, the reliability rating for the seven-point scale was at least .7055 for each type of

relative clause and at least .5933 for each type of clause for the dichotomous judgments. The elimination of these divergent judgments seemed principled in light of subsequent interviews, which revealed that participants had merely guessed at some of their answers. The elimination of what appears to be spurious data is done routinely in natural science experiments when high and low scores are not analyzed.

The reliability of the results in the Gass (1994) study, which eliminated highly uncertain responses, was confirmed by data from another evaluative method, in this case a structured oral production task. These results indicate that a methodology that includes a retest, a confidence rating scale, and data from another source can allow researchers to find and eliminate spurious data, thereby increasing the meaningfulness of grammatical judgment tests.

The Spanish Verb Aspect Judgment Test

The participants in the present study took the Spanish Verb Aspect Judgment Test, developed specifically for this project, on a computer in the school language lab. Seated before the computer, they first read a statement describing the three tasks before them: (1) a grammatical judgment test pertaining to verb aspect and two related tasks, (2) a confidence rating and (3) an oral rationale recording (see Appendix B). They then began Task 1, the judgment test, by reading a narrative frame around which the judgment test had been built. This initial story frame did not contain, however, the twenty preterite/imperfect decision points they would see later. In order to make appropriate choices between preterite and imperfect verb forms, language users must understand the flow of events in a narrative, apperceiving, for example, which events at each particular point in the story line are completed and which are ongoing. Accordingly, the purpose of this initial reading of the story was to provide participants

with a conception of the entire story, of the entire textual context, before they started to make preterite/imperfect judgments related to that content.

The initial story frame as well as the subsequent judgment test itself, was presented in English, so as to clarify for English-speaking participants the exact aspectual meaning being expressed by a verb in a given context, e.g., durative vs. finite, etc. Employing an English narrative frame in this manner was thus intended to focus grammatical judgments purely on verb aspect and eliminate potential confounds with extraneous variables such as knowledge of Spanish vocabulary.

The story was constructed to include verb slots reflecting an approximately equal number of Frantzen's six aspectual principles (see Appendix C). Nine decision points were constructed to unambiguously (given the narrative frame provided) require the use of the imperfect. Three of those verb slots demanding an imperfect form expressed Frantzen's principle of ongoing action: decision points 1 (*was visiting*), 9 (*was only twelve*) and 13 (*had to*). Two of the verb slots demanding an imperfect form reflected habitual action: decision points 8 (*rode my bike*) and 14 (*used to be*). Two of the verb slots demanding an imperfect form captured repetitious action: decision points 6 (*would try*) and 7 (*would begin*). The remaining two imperfect decision points expressed anticipated or planned action: decision points 11 (*was planning*) and 19 (*was going*).

Five of the decision points were constructed to unambiguously (given the narrative frame provided) require the use of the preterite. Two of the verb slots demanding a preterite form reflected the beginning of action: decision points 5 (*thought of*) and 17 (*answered*). The other three verb slots demanding a preterite form expressed the completion of action and actions with both a beginning and an end: decision points 2 (*went*), 15 (*called*) and 20 (*rode*). Either the preterite or the imperfect could have been used for the remaining five decision points: decision

points 3 (*was great*), 4 (*was so excited*), 12 (*couldn't*), 16 (*wanted*) and 18 (*had*). These five decision points allow us to see what kind of choices students make and what kind of rationale they give when presented with an ambiguous sentence context, i.e., whether their aspectual choice and rationale reflect stereotypical usage and thinking or show more advanced usage.

In constructing the grammaticality test, an attempt was also made to include usage that contradicts some of the half-truths Frantzen (1995) cites. This design feature was implemented to see if students, indeed, use half-truths in their thinking and decision making. One of the half-truths Frantzen cites is the “requirement” to use the imperfect with verbs of mental activity and emotions. In the constructed story frame, decision points 4 and 5 both reflected mental activity or emotion, but only the preterite is appropriate at decision point 5 (*I thought*). While either the preterite or the imperfect could appear at decision point 4 (*I was so excited*), I wanted to see how many students would give the half-truth as their rationale and how many would focus instead on the aspectual principle of completion expressed in that sentence context.

A second half-truth prescribes the use of the preterite in conjunction with references to distinct amounts of time. Contradictions to this rule are found at decision points 8 and 16. While decision point 8 includes the phrase *for at least two hours*, it requires the imperfect because the repetitious action expressed is the main focus of the speaker. Decision point 16 includes the phrase *all that day*, a distinct amount of time. While the preterite is possible, the imperfect is also possible given the “ongoingness” that phrase also expresses. At this decision point, participants also had the opportunity to call upon an aspectual principle rather than a half-truth as a rationale.

Decision points 15 and 20 contradict the half-truth that the imperfect must be used with repeated action. At decision point 15 the phrase *10 times* is found, suggesting repeated action, but the preterite must be used at this point because the sentence specifies a definite number of

repetitions, an indication of completed action. At decision point 20 the adverb phrase *every day* implies repeated action, but the focus of the phrase is on the completion of action, so the preterite must be used.

After reading the story in English, participants read instructions on how to take the grammatical judgment test on the computer and practiced with a sample sentence (see Appendix D). They then saw, on the computer, the same paragraph that they had just read but this time with 20 verbs or verb phrases in the story numbered in superscript (see Appendix E). For each of those 20 numbered verbs they found, below the story, a corresponding pull-down menu. Each of those menus contained the Spanish preterite verb form as well as the Spanish imperfect verb form that corresponded to the English verb or verb phrase. The verbs were appropriately conjugated as either preterite or imperfect, however the *terms* “preterite” or “imperfect” were never used explicitly in this study. Participants decided whether the preterite or imperfect should be used at each decision point and clicked on the corresponding form.

Scoring the Spanish Verb Aspect Judgment Test. Student answers to the untimed grammatical judgment test were coded for conventional preterite and imperfect usage. The answers of five native Spanish speakers were used as the criteria for confirming expected preterite and imperfect usage. These native speakers are all university educated and are teachers of Spanish. At least four of the five native speakers had to agree on an answer before it was considered conventional usage. As predicted by Frantzen’s (1995) aspectual principles, in the cases of decision points 3, 4, 10, 12, 16 and 18 both the preterite and the imperfect were chosen by native speakers, and both verb forms were therefore deemed acceptable in these sentence slots. Once again---consistent with Frantzen’s aspectual principles ---the preterite was determined by native speaker consensus to be conventional usage for decision points 2, 5, 15, 17 and 20. The

imperfect was similarly consensually deemed to be acceptable for decision points 1, 6, 7, 8, 9, 11, 13, 14 and 19.

At each decision point, student responses matching native speaker choice of aspect were recoded with a *1*, whereas responses dissimilar to conventional usage were recoded with a *0*; conventional usage by students resulted in their being awarded a point and unconventional usage resulted in no points. For example, if students selected *visitaba* at decision point one, they were awarded a point and their answer was recoded as *1*, for native speaker consensus required the use of the imperfect at that decision point. If, on the other hand, students selected *visité* at that decision point, they did not receive a point and their answer was recoded with a *0*; their answer did not fall within the bounds of conventional usage as established by the native speakers.

Student answers were counted at only nineteen of the twenty decision points, because student rationales at decision point 10 (*I already competed in races*) revealed that many students interpreted the sentence to mean that the speaker had already competed in races prior to that point in his life, not that he *was already competing* in races. Because of the frequency of this interpretation, decision point 10 was deemed to be an ambiguous source for data regarding student knowledge of aspect.

After student responses at each decision point had been recoded with either a *1* or *0*, three different conventional usage scores were calculated:

- 1) aggregated preterite and imperfect usage (preterite verb form selected at preterite decision points and imperfect verb form selected at imperfect decision points)
- 2) preterite usage (preterite verb form selected at preterite decision points)
- 3) imperfect usage (imperfect verb form selected at imperfect decision points)

With the elimination of item 10, the verb test aggregated preterite and imperfect aggregated scores ranged from 1 to 19, the preterite usage scores ranged from 0 to 10, and the imperfect usage scores ranged from 0 to 14.

Stability of Judgment Test Scores Across Time

Gass (1994) charged users of grammatical judgment tests with the obligation to establish reliability across time for such instruments. If student responses were not mainly consistent from one administration to another, she argued, then it could hardly be claimed that they “know” the grammatical constructions about which they were being asked to render judgments. For the Spanish Verb Aspect Judgment Test developed here, there was no decision point for which there was more than a 29% change in answers between the first administration and the retest, signifying at least a 70% replication on all items. Therefore, the test-retest reliability was judged sufficiently robust to justify using overall judgment test scores in subsequent analyses.

Confidence Rating and Data

Once participants had indicated their choices at each of the 20 preterite/imperfect decision points, they rated their confidence (See Appendix F) in their answers by using a newly-appearing pull-down menu corresponding to each decision point. The pull-down menu permitted participants to select a point on a scale from 0 to 10. On this confidence scale “0” represented “not confident”, the midpoint “5” represented “moderately confident,” and “10” represented “extremely confident.” Students were asked to rate their confidence in their verb choices to determine, for reliability purposes, any decision points at which they had indeterminate knowledge.

Gass (1994) argued that student confidence ratings also ought to figure into the acceptance or rejection of grammatical judgments. After all, if students were merely guessing

and did not feel at all comfortable about their choices, they could hardly be said to ‘know’ the grammatical feature about which they were being asked to render judgment. For the Spanish Verb Aspect Grammatical Judgment Test, the average confidence rating for each item was 6.9 out of a maximum of 10; for no item was the average confidence rating below the midpoint of 6. Accordingly, no item was rejected because of lack of student confidence in their judgments.

Verb Aspect Judgment Rationales

The third task for participants was to record oral rationales for their answers (see Appendix G). They spoke into a freestanding microphone an explanation of their choice of the preterite or the imperfect for each decision point. The rationales were recorded in digital form on the school server. These rationales were elicited in order to ascertain the abundance and contents of participants’ explicit knowledge, i.e., to find out how often they could restate and apply correctly the principles and rules they had been taught and to discover if their explicit knowledge was aspectual based, teacher- or textbook-rules based, or self-generated.

Rationale Categories

Students’ recorded verb aspect judgment rationales for the 19 decision points were transcribed and were subsequently coded into one of 41 categories presented in Table 1.

Table 1

Grammatical Judgment Test Rationale Coding Categories

Aspectual Principles

Preterite

1- the completion of past actions/ completed actions, definite end(ing), ended, stopped, over & done with, definite past, not ongoing, no more, not a lawyer any more, (went)... and that’s it, did it, already + verb, something that happened, something he did in past, happened

Imperfect

4- actions and states in progress at some focused point in the past/ continuous, continual, in process, ongoing, kept going, progressive, never completed, not completed, not definite ending, not stopped,

previously, used to be but not now, in past

2- the beginning of past actions

3- actions with both a beginning and an end

5- actions whose beginning and/or end is unknown or unimportant

6- habitual past actions/consistent

7- repetitious past actions

8- anticipated/planned past actions

Teacher and Textbook Rules

Preterite

9- one time occurrence/single action, one time action, one occasion, had her one answer

10- actions with a specific duration/actions with a time limit, certain period of time

11- actions that occurred at a definite point in time/actions at distinct/specific date or time, right then, at that point, at that instant

12- sudden changes

13- events or actions/definite or specific actions, things; action; past action, action in past

14- actions in a series

15- interrupting actions

16- to advance the narrative

17- Key words such as *primero, entonces, después, luego, más tarde, finalmente, por fin, de repente, ayer, el año pasado, por la mañana, a la una, al día siguiente/* (1960, that Monday, one weekend, one day, all that day, for the next few hours, for next 30 years—with preterite)

Imperfect

18- description of people, things and places

19- repeated action, multiple actions, did a lot, over and over again, recurring, not single time/event

20- age

21- time

22- emotions, and physical or mental states/feelings

23- states and conditions/what something or someone was like

24- simultaneous actions

25- an action interrupted by another action

26- actions or situations that set the stage for another action or provide background information

27- Key words such as *cuando, de niño, siempre, a menudo, a veces, todos los días, en aquel entonces, con frecuencia, cada día, mientras, al mismo tiempo, durante, muchas veces/* (every time, every day, all that day, earlier in his life, when he was younger, next few hours, for next 30 years, one weekend—with imperfect)

28- Spanish equivalent of *was, were + ing*

29- Spanish equivalent of *would + verb*

30- Spanish equivalent of *used to + verb*

Student-generated rules

Preterite

31- specific, definite, definitive

32- Spanish Equivalent of English simple past

33- English simple past, not *was/were* +*ing*, *would*, *used to*

Imperfect

34- not definite action, not set action, not an action verb, not an event

35- over a period of time, lasted for a while—with imperfect

36- *was*, *were* + *ing*, *would*, or *used to*, not simple past

37- actions without a specific duration, no time frame, no specific block of time, no certain amount of time, general period of time

38- actions that did not occur at a definite point in time, not a specific point in the past, not one moment in time, longer than one specific moment

Other

39- idiosyncratic- something that is not one of the above rules or principles but rule or principle-like

40- sounded/sounds/seems right

41- uncodeable because rationale makes no sense, is unintelligible, or is absent

The coding categories for the judgment rationales were partly determined *a priori*, based on the principles guiding the construction of the Spanish Verb Aspect Judgment Test, and partly emergent. These 41 coding categories were comprised of (1) Frantzen (1995) aspectual principles (six total) and aspectual principles elicited from participants' classroom teachers or identified in participants' textbooks (two total), (2) rules elicited from participants' classroom teachers or identified in participants' textbooks (23 total), (3) rules induced from the student rationale data (eight total) and (4) other categories (three total).

Principles vs. rules. As operationalized previously, the term *principles* refers to explanations that are broader in scope than rules; they get at the underlying concepts behind a grammatical point. For this reason, they are reliable indicators of use. Conversely, the term *rules* are explanations that are more prescriptive, more case specific, and because of their case

specificity often tend to be half-truths. Rules in this sense are similar to the notion of ‘heuristics,’ which in problem -solving tasks can prove to be serviceable shortcuts, though their degree of fidelity to target concepts is immaterial, and utilizing them slavishly will not infrequently lead to errors (Kahneman, Tversky, & Slovic, 1982). Rules, for our purposes here, are all explanations that are either case specific and/or half-truths, regardless of the level of abstraction.

All Frantzen' s principles and the two principles taken from teachers and textbooks are broader and reliable indicators of use and are therefore called *principles*. All teacher and textbook rules as well as student rules are either case specific and /or half-truths, and as such, are labeled *rules*, even though some of the student rules sound like broader, underlying principles. For example, student imperfect rule 35, *actions that did not occur at a specific point in time*, is broad enough to be considered a principle, but it is not a reliable indicator of use (i.e., it is a half-truth), and is therefore called a rule. One can think of many contexts which do not specify a definite point in time in which the preterite, not the imperfect, is used: *Yo estuve muy triste durante mucho tiempo. (I was sad for a long time)*. The verb is in the preterite (*estuve*), yet a definite point in time is not specified.

Aspectual principles. Frantzen's six aspectual principles and the two aspectual principles elicited from teachers and identified in textbooks constitute coding categories one through eight. A thorough preliminary examination of the rationales revealed that participants did not always state a principle precisely as Frantzen or as teachers and textbooks had. These alternatives, though, were often simply paraphrases of one or another of the Frantzen principles and were, accordingly, coded as the principle itself. For example, for principle one, *the completion of past*

actions, student phrases such as *completed action*, *definite ending*, *did it*, and *already + verb*, captured the essence of the principle.

Teacher and textbook rules. Teacher and textbook rules for the preterite and imperfect made up coding categories nine through 30 (see Table 1). The rules came from one of two sources: (1) Spanish levels two through five student textbooks *Ven Conmigo II*, *Nuevos Destinos*, *Repaso* and *A Graded Spanish Reader*---each of which has been used at the research site for several years---and (2) current Spanish teachers at the school. Spanish teachers filled out a questionnaire on the preterite and imperfect rules they gave to their students. For a rule to be seen as a representative of the type of rule students are exposed to, it had to be elicited or identified by two or more sources. One source of exposure was not sufficient for a rule to be deemed representative. As they had done with the aspectual principles, participants at times paraphrased a rule. Rule nine, *one time occurrence*, was paraphrased by students as *single action*, *one-time action*, *one occasion*, etc.

Student-generated rules. While some student rationales were paraphrases of Frantzen principles or teacher or textbook rules, others were found to constitute neither a Frantzen principle nor a teacher or textbook rule. Instead, they were student-generated rules, that is, rules students created that were either the inverse or a reduced form of a teacher or textbook rule, or an original rule of a student's own making. Student rule 34, *actions without a specific duration*, was the inverse of teacher and textbook rule nine, *actions with a specific duration*. Students reduced the teacher and textbook rule, *events or actions*, (for which they used paraphrases like definite or specific actions), to *specific*, *definite*, *definitive*. Students created original rules such as *equivalent of English simple past*, e.g., "called," therefore, preterite." These student rules constitute coding categories 31 through 38.

Other categories. Three *other* coding categories were induced from the data as well: (1) idiosyncratic, (2) sounded/seemed right, and (3) uncodeable. Category 39, *idiosyncratic*, encompasses rationales that were neither aspectual principles, teacher or textbook rules, nor student rules but that were, nonetheless, a rule-type explanation of why the preterite or the imperfect was used, e.g., "It' s the imperfect because it' s at the beginning and it helps you get the gist." As the examples demonstrate, these idiosyncratic rules or explanations, while student generated, did not fit neatly into any of the student rules categories because they were very individualistic in nature. The *Sounded right* category was marked when participants stated that either the preterite or the imperfect just sounded or seemed right to them. Category 40, *English simple past*, refers to participants' use of the simple past as a rationale. *Uncodeable*, category 41, was used when rationales were nonsensical, unintelligible or absent.

Coding multiple rationales. A coding problem presented itself because of multiple rationales given for a single verb choice decision. Students often gave more than one rationale at a given decision point to explain their choice of preterite or imperfect. To capture the fullness of what they said and be able to give a comprehensive report on their explicit knowledge, each rationale at a decision point that was not a restatement was coded. For example, if students said "fui, preterite, because it's completed, it's finished", their responses were coded only as one Category 1 rationale, because *finished* is synonymous with *completed*. However, if they said, 'preterite, because it's finished and it's a one time occurrence, rationale Categories 1 and 9 both were coded, to capture the multiple nature of those rationales.

Inter-coder reliability for rationale coding. To measure coding reliability, a co-rater coded 285 rationales or 10 percent of the total of 2850 rationales. These rationales came from five participants chosen at random at each of the three levels (fifteen different participants in total).

Each rationale was coded into one of the 41 categories appearing in Table 1. The co-rater is a current French teacher with a BA in French who has taught for 14 years. While she does not know a great deal of Spanish, she is very familiar with the type of perfective and imperfective aspect expressed by the preterite and imperfect in the French *passé composé* and *imparfait*. The reliability coefficient was found to be at the acceptable level of .80.

Grammatical judgment rationale scores. After coding each oral rationale (offered in explanation of each of the 19 grammatical judgment decision points) into one of the 41 categories described in Table 1 above, quantitative rationale scores were derived in order to reflect the kinds of knowledge students displayed in those rationales. To see how accurately students applied the knowledge they verbalized, for the purposes of this analysis only rationales for correct grammatical judgments (i.e., aspect-appropriate decisions) were tabulated. If rationales at all decision points, without regard to contextual correctness, had been included in the composite count, only ability to verbalize knowledge---not ability to articulate **and** correctly apply it---would have been credited. Rigorous knowledge of a rule implies not just being able to verbalize that knowledge but being able to apply it as well.

Rather than reporting relative frequency of usage for all 41 types of rationale codes, the data were aggregated to reflect the major divisions of the coding system. In this way, interested educators can ascertain whether students tended to articulate accurate knowledge of preterite rather than of imperfect, or whether they tended to accurately apply teacher/textbook rules, or rules which they had generated on their own. Resulting dependent variables thus correspond to the intersection of (a) aspectual principles, (b) teacher/textbook rules, and (c) student-generated rules with (i) preterite and (ii) imperfect decisions points. Composite variables summarizing

these subdivisions were also calculated. The resulting dependent variables are shown in Table 2 below.

Table 2

Aggregated Dependent Variables for Reporting Grammatical Judgment Rationale Scores

Source of Knowledge	Preterite Aspect	Imperfect Aspect	Total Aspect
Aspectual Principles	Principles _{pret}	Principles _{imp}	Principles _{tot}
Teacher/Textbook	TTRules _{pret}	TTRules _{imp}	TTRules _{tot}
Rules			
Student-Generated	SRules _{pret}	SRules _{imp}	SRules _{tot}
Rules			

While only one rationale reflecting each type of knowledge at aspect-appropriate decision points was counted in the calculation of a particular composite variables, overlap was allowed (e.g., students could potentially be credited with a preterite principle, a preterite teacher/textbook rule, and a preterite student rule all at the same preterite decision point toward the composite score for each of those composite variables). Additionally, because only 45% of students gave at least one rationale at each of the 19 decision points (that is, 55% had at least one missing rationale), the composite scores for all three total aspect rationale variables (Table 2) were calculated as proportions (see note ¹ for an explanation of how these proportions scores were calculated). Yet the composite raw frequency score was used in the calculation of the three preterite aspect rationale variables and the three imperfect aspect variables because of the difficulty in computing an accurate proportion for these variables (see note ²).

Three other scores were also calculated for grammatical judgment rationales. The first, an aggregate principles and rule score (total number of aspectual principles, teacher/ textbook rules, and student-generated rules articulated), was computed based on raw frequency to obtain data relevant to the question of the abundance of student knowledge at each year of study. The second, a percentage score reflecting average articulation of principles and rules per aspect-appropriate decision point, that is, the average number of correct principles and rules articulated at each decision point, was also calculated to see how abundant explicit knowledge was at each year of study. The third score was the total number of unused categories out of the total of 41. This was calculated to determine if student principle and rule strategy changed as they moved from one year of study to the next.

Written Language Production Tasks

In the fourth phase of data collection, participants completed two writing tasks. For each, they described in the past tense a favorite movie or TV episode. (See instructions in Appendix H.) They were asked to write about a different movie or TV show for each of the two tasks. They were instructed to write in the past tense, but the instructions never mentioned either the preterite or the imperfect. In this way, it was hoped that the task would simulate real communication about past events, which could include verb forms other than just the preterite and the imperfect.

For the first production task, participants wrote for fifteen minutes in class. They were instructed to concentrate on content, on the story itself, and not on form. The purpose of this task was to ascertain the degree and manner in which participants used the preterite and imperfect when limited time does not, for the most part, easily allow their explicit knowledge to come into play.

For the second production task, participants wrote a similar description for homework the same night, under which circumstances they, of course, had unlimited time. They were asked to focus on form in their writing. It was hoped that with plenty of time to analyze their choice of tense or aspect, along with instructions to focus on form, their writing would constitute a more direct reflection of language learners' explicit knowledge. To motivate them to do their best, participants were told ahead of time that their work would be graded on both writing tasks.

Coding Verb Aspect Production in Writing Samples

It was desirable to see the extent to which students used each type of verb aspect in their spontaneous written language, but it was also desirable to see how often they used these verb forms *plausibly*, that is, in sentence contexts where they make sense. Accordingly, the following categories of verb usage were coded in all the writing samples:

- 1) plausible preterite usage (use of a preterite verb form in a sentence slot plausibly calling for preterite usage)
- 2) plausible imperfect usage (use of an imperfect verb form in a sentence slot plausibly calling for the imperfect)
- 3) non preterite and imperfect verb forms (use of a verb form that was not in the preterite or the imperfect, i.e., the present tense, the subjunctive, the past perfect, etc.)
- 4) uncodeable as either preterite or imperfect (use of a verb form in a preterite or imperfect sentence slot that was not discernibly preterite or imperfect in its conjugation)

In determining the plausibility of preterite and imperfect usage, the correctness of the conjugation of a verb (i.e., mechanical correctness) was not considered unless the verb was misconjugated to the point that it was unrecognizable as either a preterite or an imperfect verb

form; it was then coded as uncodeable as either the preterite or the imperfect. The semantic appropriateness of the verb also did not enter into consideration. For example, if a student used a form of *ser*, one of the two verb in Spanish meaning "to be," and should have used a form of *estar*, the other verb meaning "to be," this semantic error had no bearing on the coding of aspectual appropriateness.

Inter-Coder Reliability for Production Scores

A co-rater coded the verbs for a total of 25 writing samples or 10% of the total number of 252 writing samples. The co-rater is a Ph. D. in Language Education who also holds a BA in Spanish and an MA in Latin American Studies. He is a native speaker of English; however, he served as an adjunct professor of Spanish for three years. He has tutored Spanish for more than 10 years. He has lived and traveled in Puerto Rico, Argentina, Peru and Mexico. Table 3 reports the inter-coder reliability for each of the six coding categories by writing task.

Table 3

Inter-coder Reliability of Aspect Production Data

	In-class writing task	Out-of-class writing task
Plausible preterite usage	.937	.925
Plausible imperfect usage	.997	.901
Non preterite and imperfect usage	.886	----
Uncodeable as either preterite or imperfect	.978	.955

Note: Non preterite and imperfect usage could not be calculated because one of the co-raters found no instances of this category.

Table 3 shows that the reliability coefficients were high enough for the composite scores based on the coding of students' written production to be used in subsequent statistical tests.

Written Production Variables

There were five dependent variables of interest reflecting deployment of aspectually-marked verbs in students' written production:

- 1) plausible preterite production
- 2) plausible imperfect production
- 3) total attempted preterite production (plausible plus other production)
- 4) total attempted imperfect usage (plausible plus other production)
- 5) aspectual variety (ratio of preterite usage to combined preterite and imperfect usage)

Each of these variables was calculated for both in-class and out-of-class writing tasks, making for total of 12 written production variables. These 12 variables were converted into proportional scores (see note ³). The proportion scores allow the frequency of a variable to be examined within the larger context of correct usage, incorrect usage and other tense usage, thereby diminishing the skewing effect that raw scores can sometimes have.

Statistical Analyses

Various statistical tests were performed on the composite scores obtained for the variables of interest. To answer question 1 concerning the contents of student explicit knowledge, Z tests of proportionality were performed within each year of study on the three main dependent variables related to verb aspect knowledge in grammatical judgment rationales—Principles_{tot}, TTRules_{tot}, and SRules_{tot}. One-way ANOVAs were carried out by year of study on the same three main dependent variables. One-way ANOVAs were also performed by year of study on the six dependent preterite and imperfect variables related to verb aspect

knowledge in grammatical judgment rationales--Principles_{pret}, TTRules_{pret}, SRules_{pret}, Principles_{imp}, TTRules_{imp}, and SRules_{imp}. Additionally, a one-way ANOVA was performed on the dependent variable reflecting student aggregate (sum of) articulation of principles and rules . Another one-way ANOVA was carried out by year of study on the dependent variable tabulating the number of unused categories. This latter analysis was intended to reflect (inversely) the variety of knowledge categories invoked by participants.

To answer question 2 concerning the relations between student explicit knowledge of the preterite and the imperfect in grammatical judgment rationales and grammatical judgment test performance, correlations were run by year of study and multiple regressions across all years of study between each of the variables related to the three main types of knowledge in grammatical judgment rationales listed above, and aggregate preterite and imperfect judgment test conventional usage scores. Correlations and regressions were also carried out on the six variables listed above related to preterite and imperfect knowledge type and disaggregated preterite and imperfect judgment test scores. The *other* categories and confidence ratings were also correlated and regressed against aggregate preterite and imperfect judgment test conventional usage scores.

To answer question 3 concerning the relations between types of explicit knowledge and written production, first repeated measure analyses were carried out on three variables reflecting written plausible aspect production—in-class and out-of-class aggregate preterite and imperfect production, in-class and out-of-class plausible preterite production and in-class and out-of-class plausible imperfect production; three variables reflecting frequency in written production—in-class and out-of-class attempted aggregated preterite and imperfect production, in-class and out-of-class attempted preterite and in-class and out-of-class attempted imperfect; and one variable reflecting variability in production—in-class and out-of-class variability production. These

seven dependent variables were also correlated with aggregated and disaggregated preterite and imperfect scores on the judgment test.

CHAPTER 4

RESULTS

Research Question 1: What are the explicit contents of instructed learners' knowledge of the preterite and the imperfect for students at different levels of study?

Are they more rule-based or principle-based?

How abundant are these contents and do they become more abundant at higher levels of proficiency?

How proficient are students at restating verbatim the rules they have been taught?

Articulated Knowledge of Verb Aspect

Comparing Types of Knowledge Within Each Year of Foreign Language Study

Verb aspect knowledge in general (aggregated across both preterite and imperfect). The most basic way to address Research question 1 is simply to ask what types of aspectual knowledge—principles, teacher/textbook rules, or student-generated rules—are used most frequently by students in justifying their selection of one verb form or another. To ascertain what type of knowledge of the preterite and imperfect students most frequently articulated at each year of study (i.e., which of the three types of knowledge were invoked at least once at each of the 19 aspect decision points), Z tests of proportionality were carried out on the three types of verb aspect knowledge in grammatical judgment rationales—articulation of aspectual principles ($\text{Principles}_{\text{tot}}$) articulation of teacher and textbook rules ($\text{TTRules}_{\text{tot}}$) and articulation of student

rules (SRules_{tot})—within each of those years of study. Table 4 shows the proportions of each of the three types of rationales and the resulting Z tests comparing each pair of learning levels.

Table 4

Within Year-of-Study Z Tests of Proportionality on Types of Verb Aspect Knowledge in Grammatical Judgment Rationales

	Year 3	Year 4	Year 5
Principles _{tot}	16.96%	15.17%	19.66%
TTRules _{tot}	50.36%	52.77%	50.89%
Z score	16.378*	17.819*	13.942*
Principles _{tot}	16.96%	15.17%	19.66%
SRules _{tot}	19.13%	22.71%	17.41%
Z score	1.333	4.3159*	.9579
TTRules _{tot}	50.36%	52.77%	50.89%
SRules _{tot}	19.13%	22.71%	17.41%
Z score	15.410*	13.457*	12.084*

As indicated in Table 4, at each year of study students articulated proportionally more teacher and textbook rules than aspectual principles or student-generated rules. In addition, at the fourth and fifth years of study learners invoked student-generated rules with significantly greater frequency than they did aspectual principles.

Cross-Sectional Comparison of Knowledge Type Across Year of Study

Verb aspect knowledge in general (aggregated across both preterite and imperfect). To determine the effect of year of Spanish study on students' explicit knowledge of aspect in Spanish, a series of one-way ANOVAs by year of study were carried out on the three major types of verb aspect knowledge in grammatical judgment rationales—aspectual principles (Principles_{tot}), teacher and textbook rules (TTRules_{tot}) and student rules (SRules_{tot}). Table 5 provides descriptive statistics for these types of knowledge by student year of study.

Table 5

Student Year of Spanish Study Means and Standard Deviations for Types of Verb Aspect Knowledge in Grammatical Judgment Rationales

		Principles _{tot}	
	N	Mean	Standard Deviation
Year 3	53	.1742	.1519
Year 4	42	.1807	.1589
Year 5	41	.2098	.2164
		TTRules _{tot}	
	N	Mean	Standard Deviation
Year 3	53	.5376	.1877
Year 4	42	.6217	.1769
Year 5	41	.5452	.1943

		SRules _{tot}	
	N	Mean	Standard Deviation
Year 3	53	.1873	.1666
Year 4	42	.2523	.1767
Year 5	41	.1947	.1463

Table 6 summarizes one-way ANOVAs testing the effects of year of study on each of the three types of aspect knowledge reflected in grammatical judgment rationales.

Table 6

One-Way ANOVAs Testing Effect of Year of Spanish Study on Types of Verb Aspect Knowledge in Grammatical Judgment Rationales

Source	df	Sum of Squares	Mean Squares	F ratio	p
Principles _{tot}					
Between Groups	2	.03165	.0583	.512	.600
Within Groups	133	4.108	.03089		
Total	135	4.140			
TTRules _{tot}					
Between Groups	2	.191	.09531	2.741	.068
Within Groups	133	4.624	.03477		
Total	135	4.815			

SRules _{tot}					
Between Groups	2	.112	.05600	2.081	.129
Within Groups	133	3.580	.02692		
Total	135	3.692			

The series of one-way ANOVAs summarized in Table 6 revealed that there was no effect for year of study on articulation of aspectual principles, articulation of teacher and textbook rules, or articulation of student rules.

Preterite aspect knowledge. Whereas the preceding analyses aggregated across knowledge of preterite aspect and imperfect aspect, this next analysis focused specifically on knowledge needed for appropriate selection of preterite aspect forms. To quantify student knowledge of preterite principles and rules, three types of preterite verb aspect knowledge in grammatical judgment rationales were calculated.

- 1) preterite aspectual principle articulation (Principles_{pret}) (i.e, aspectual rationales that justify a preterite verb choice)
- 2) preterite teacher and textbook rule articulation (TTRules_{pret}) (i.e., teacher and textbook rules that justify a preterite verb choice)
- 3) preterite student rule articulation (SRules_{pret}) (i.e., student rules that justify a preterite verb choice)

Table 7 shows descriptive statistics for the three types of preterite aspect knowledge reflected in judgment test rationales.

Table 7

Student Year of Spanish Study Means and Standard Deviations for Types of Preterite Aspect Knowledge in Grammatical Judgment Rationales

Year of Study	N	Mean	Standard Deviation
Principles _{pret}			
Year 3	53	1.7358	2.1407
Year 4	42	1.3810	1.8735
Year 5	41	1.9029	1.7861
TTRules _{pret}			
Year 3	53	3.2830	2.2986
Year 4	42	4.2857	1.7006
Year 5	41	3.9024	2.6058
SRules _{pret}			
Year 3	53	1.7547	2.2614
Year 4	42	1.8810	1.8505
Year 5	41	1.4146	1.3034

Table 8 reports the results of a series of one-way ANOVAs testing the effects of student year of Spanish study on types of preterite aspect knowledge.

Table 8

One-Way ANOVAs Testing Effect of Student Year of Spanish Study on Types of Preterite Aspect Knowledge in Grammatical Judgment Rationales

Source	df	Sum of Squares	Mean Squares	F ratio	p
Principles _{pret}					
Between Groups	2	5.948	2.974	.776	.462
Within Groups	133	509.816	3.833		
Total	135	515.765			
TTRules _{pret}					
Between Groups	2	24.446	12.223	2.445	.091
Within Groups	133	664.936	5.000		
Total	135	689.382			
SRules _{pret}					
Between Groups	2	4.862	2.431	.679	.509
Within Groups	133	476.167	3.580		
Total	135	481.029			

As indicated in Table 8, none of the types of preterite aspect knowledge---preterite aspectual principle articulation, preterite teacher and textbook rule articulation, or preterite student rule articulation---exhibited a significant difference across year of study.

Imperfect aspect knowledge. Whereas the previous analysis pertained to knowledge of preterite verb aspect, this analysis concerns explicit knowledge of imperfect verb aspect. To determine the extent of student knowledge of imperfect principles and rules, three types of

knowledge related to imperfect rationale invocation, that is, to the invoking of a rationale in the grammatical judgment test to justify an imperfect verb choice, were calculated. These three types of knowledge were

- 1) imperfect aspectual principle articulation ($\text{Principles}_{\text{imp}}$) (i.e., aspectual principles that justify an imperfect verb choice)
- 2) imperfect teacher and textbook rule articulation ($\text{TTRules}_{\text{imp}}$) (i.e., teacher and textbook rules that justify a imperfect verb choice).
- 3) imperfect student rule articulation ($\text{SRules}_{\text{imp}}$)(i.e., student rules that justify an imperfect verb choice)

Table 9 gives descriptive statistics by year of study for the three types of knowledge related to imperfect aspect in grammatical judgment rationales.

Table 9

Student Year of Spanish Study Means and Standard Deviations for Types of Imperfect Aspect Knowledge in Grammatical Judgment Rationales

Year of Study	N	Mean	Standard Deviation
		$\text{Principles}_{\text{imp}}$	
Year 3	53	1.3962	1.7469
Year 4	42	1.5800	2.0387
Year 5	41	1.8293	2.4688

TTRules _{imp}			
Year 3	53	6.3585	2.8154
Year 4	42	6.9524	2.5752
Year 5	41	6.0488	2.3016

SRules _{imp}			
Year 3	53	1.6225	1.8316
Year 4	42	2.6095	2.4938
Year 5	41	1.9512	1.9229

Table 10 shows the results of a series of one-way ANOVAs carried out on types of student knowledge of imperfect aspect reflected in grammatical judgment rationales.

Table 10

One-Way ANOVAs Testing Effect of Student Year of Spanish Study on Types of Imperfect Aspect Knowledge in Grammatical Judgment Rationales

Source	df	Sum of Squares	Mean Squares	F ratio	p
Principles _{imp}					
Between Groups	2	6.876	3.438	.798	.452
Within Groups	133	572.889	4.307		
Total	135	579.765			

TTRules _{imp}					
Between Groups	2	17.644	8.822	1.310	.273
Within Groups	133	895.996	6.737		
Total	135	913.640			
SRules _{imp}					
Between Groups	2	27.308	13.654	3.146	.046
Within Groups	133	577.331	4.341		
Total	135	604.640			

Table 10 revealed that there was a significant difference between the groups in their articulation of imperfect student-generated rules. Pair-wise post-hoc comparisons showed that fourth year students invoked student-generated rules for imperfect grammaticality judgments more frequently than did third year students: $t(133) = 1.0678$, $p < .05$. Fifth year students did not differ from students in either of the other years of study.

Rank Order of Categories of Aspect Knowledge

In addition to knowing about the frequencies of use of each of the three main knowledge types (principles, teacher/textbook rules, and student-generated rules), it was deemed necessary to ascertain exactly which of the 41 coded principles, teacher/textbook rules, student-generated rules and other categories student invoked most frequently and least frequently at aspect-appropriate decision points. The most liberal criterion for determining student knowledge of aspect is to ask if a student has articulated a particular rule or principle at all, that is, at least once. Accordingly, Table 11 ranks the 41 categories according to the percentage of times each was invoked at least once across all three years of study (See note ⁴ for a discussion of why total use was not the criterion).

This table also reports percentage of student potential exposure to each aspectual principle and each teacher and textbook rule. (By definition, no potential exposure rate exists for student-generated rules or for “other” categories of knowledge.) This percentage was calculated as the relative frequency of teachers and textbooks that identified a principle or rule. The maximum potential number of exposure opportunities students had was 14 (10 teachers and four texts). While these percentages are only roughly indicative of student exposure, in that each student has neither had each teacher nor used each text, they do represent a relative degree of student exposure to each principle and rule. This information was used to determine if there was a relation between frequency of student principal or rule articulation and the number of teachers and texts making that information available, that is, the degree of student potential exposure to a rule or principle.

Table 11

Percentage and Rank Order of Student Usage of 41 Categories of Aspect Knowledge with Percentage of Teacher and Textbook Potential Exposure

Rank	%	Category	Potential Exposure Index
1	74	t/t imperfect rule 27- Key words: <i>cuando, de niño</i>	21
2	70	student preterite rule 32- English simple past	--
3	64.6	t/t imperfect rule 28- <i>was, were + ing</i>	36
4	60.6	other 39- idiosyncratic	--
5	60.29	aspectual preterite principle 1- the completion of action	100
6	55.3	t/t imperfect rule 20 – age	29
7	55	t/t imperfect rule 22- emotions, physical/mental states	29

8	51.3	t/t preterite rule 9- one time occurrence	14
9	51	t/t imperfect rule 19 -- repeated action	43
10	46.3	t/t imperfect rule 18- description	79
11	46	other 41- uncodeable	--
12	44	student imperfect rule 35- lasted for a while	--
13	41	t/t imperfect rule 30- <i>used to</i>	43
14	40.4	aspectual imperfect principle 4- action in progress	64
15	33.8	t/t preterite rule 11- actions at definite point in time	29
16	32.6	t/t imperfect rule 29- <i>would</i>	14
17	32	t/t preterite rule 13- event or action	14
18	26.6	t/t preterite rule 17- key words: <i>primero, entonces</i>	14
19	23.3	student preterite rule 38-- not definite point	--
20	23	t/t preterite rule 15-- interrupting actions	50
21	21	aspectual imperfect principle 6—habitual	29
22	18.6	t/t preterite rule 10-- specific duration	21
23	17.6	student preterite rule 37—no specific duration	21
24	14.3	other 40-- sounded/seemed right	--
25	13	student imp rule 36- was/were +ing/would/used to, not simple past	--
26	11.6	t/t imperfect rule 26-- sets stage/background	29
27	10	aspectual preterite principle 3-- actions with beginning and end	7
27	10	aspectual imperfect principle 8-- anticipated/planned action	7
29	9	student preterite rule 33-- English simple past, not would/used to	--
30	8.6	student preterite rule 31-- specific	--

31	7.6	student imperfect rule 34-- not definite action	--
32	7	aspectual imperfect principle 22-- beginning/end unknown	29
33	5.6	t/t preterite rule 12-- sudden change	29
34	5.3	t/t imperfect rule 24-- simultaneous actions	64
35	5	t/t imperfect rule 25-- action interrupted	50
36	3.6	t/t imperfect rule 23—states/conditions	14
37	2.3	t/t preterite rule 16-- to advance the narrative	14
38	1.3	t/t imperfect rule 21-- time	50
39	.66	t/t preterite rule 14-- actions in a series	14
40	.01	aspectual imperfect principle -- repetitious action	0
41	0	aspectual preterite principle 2-- beginning of action	21

Note. t/t: teacher and textbook rule

As indicated in Table 11, the top quartile of knowledge categories that students invoked (at least once) was comprised of seven teacher and textbook rules, one aspectual principles, one student-generated rule, and one *other* category. Of the seven teacher and textbook rules, six encompassed the imperfect and one encompassed the preterite. The aspectual principle encompassed the preterite. The student rule was a preterite rule, and the *other* category was idiosyncratic.

The teacher and textbook rules in descending order of student usage in judgment test rationales were: imperfect rule *key words: as a child*, etc. (usage rank 1); imperfect rule *Spanish equivalent of was, were + ing* (usage rank 3); imperfect rule *age* (usage rank 6); imperfect rule *emotions, and physical and mental states* (usage rank 7); preterite rule *one-time occurrence*

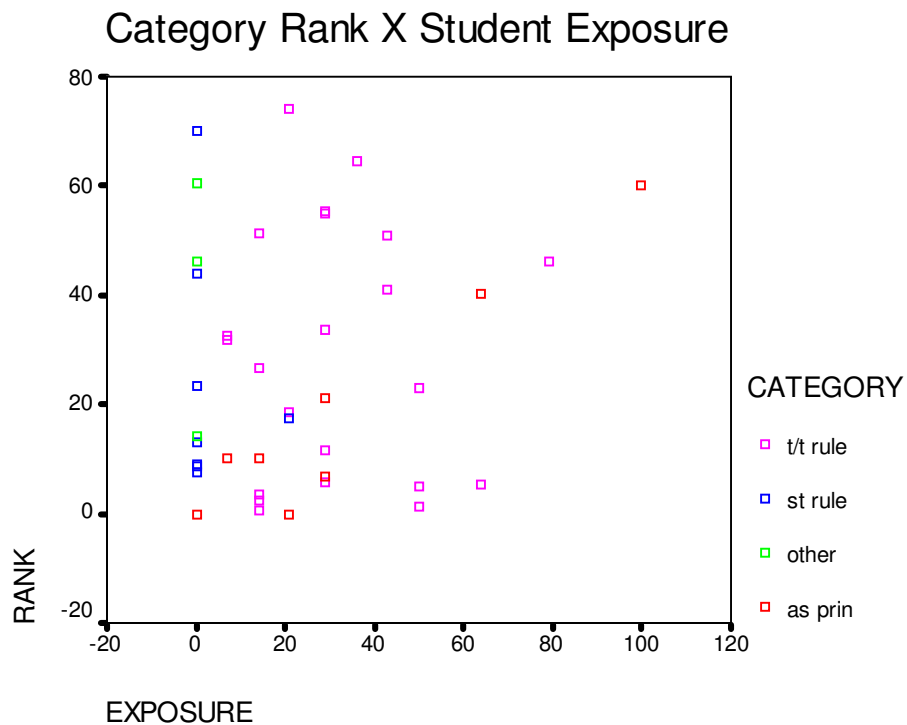
(usage rank 8); imperfect rule *repeated action* (usage rank 9); imperfect rule *description* (usage rank 10). The only aspectual principle emerging in the top 10 categories of knowledge use was preterite principle *the completion of action* (usage rank 5). The student-generated rule *simple past* was the second most frequently used category of knowledge. The "other" category *idiosyncratic* formulation was the fourth most common category in terms of student usage.

Students received the greatest potential exposure through teacher and textbooks to the following categories in descending rank order: preterite aspectual principle *the completion of past action* (usage rank 5), to which students had 100% or full exposure (14 teacher and/or textbooks referred to it); imperfect teacher and textbook rule *description* (usage rank 10), to which students potentially had 79% exposure (11 references); and imperfect teacher and textbook rule *repetitious* (usage rank rank 9) to which student had potentially 43% exposure (six teacher and/or textbook references).

For the ten categories least invoked (ranks 32 through 41), or bottom 25% of categories used at least once, seven were teacher and textbook rules and three were aspectual principles. The seven teacher and textbook rules least invoked in descending order of rank were preterite rule *sudden change* (usage rank 33); imperfect rule *simultaneous action* (usage rank 34); imperfect rule *action interrupted* (usage rank 35); imperfect rule *states and conditions* (usage rank 37); preterite rule *to advance the narrative* (usage rank 38); imperfect rule *time* (usage rank 39); and preterite rule *actions in a series* (usage rank 40). The aspectual principles were in descending order of rank imperfect principle *action whose beginning and/or end is unknown or unimportant* (usage rank 32); imperfect principle *repetitious action* (usage rank 39); and preterite principle *the beginning of past actions* (usage rank 41). The only of these categories to which

students had at least fifty percent exposure were the following teacher and textbook imperfect rules: *simultaneous actions* (rank 35), *actions interrupted* (rank 36) and *time* (rank 39).

To establish the overall degree of association between frequency of student knowledge use and frequency of potential exposure, these two indices were correlated across the 41 rationale coding categories. Student-generated rules and other categories were assigned exposure scores of zero. The overall correlation was .181 and was not statistically significant. Figure 1 shows the scatter plot for category rank by percentage of student exposure.



Note. t/t: teacher and textbook rules; st: student rules; other: other categories; as prin: aspectual principles

Figure 1

Scatter Plot of Rationale Category Rank by Percentage of Potential

Figure 1 shows graphically that many of the teacher and textbook rules that ranked the highest in usage scored relatively low on the potential student exposure index. Some teacher and textbook rules were found in the bottom left quadrant, having a low value on both measures. A number of aspectual principles are found in the same quadrant for the same reason. The aspectual principles *the completion of action* and *actions and states in progress* are, respectively, at the top and near the top of the upper right hand quadrant, having a high score for both rank and potential exposure.

Breadth of Strategy Use

To examine if students acquire a broader variety of strategies for selecting verb aspect as they progress, or if instead they narrow down to using just one or two strategies, a one-way ANOVA was run on total number of unused categories (out of the maximum total of 41). This total was expressed as a proportion because only 45% of students invoked at least one rationale at all 19 decision points, thereby making unequal the number of opportunities to not use a category. The proportion was calculated as the ratio of unused categories to the number of decision points at which students did invoke at least one rationale. Table 12 shows the descriptive statistics for this analysis and Table 12 shows the results of the ANOVA.

Table 12

Student Year of Spanish Study Descriptive Statistics for Proportion of Unused Knowledge Categories

	Year 3	Year 4	Year 5
N	53	42	41
Mean	.3515	.3159	.3347
Standard Deviation	.1090	.0610	.1265

Table 13

One-Way ANOVA Testing Student Year of Spanish Study on Proportion of Unused Knowledge

Categories

	SS	df	MS	F	P
Between	.0297	2	.0148	1.397	.251
Within	1.411	133	.0106		
Total	1.440	135			

Table 13 shows that there was no significant difference between the groups in their proportion of unused categories, that is, they neither narrowed down to one or two strategies nor acquired a broader variety of strategies as they progressed from one year to another. The cell means may be interpreted as reflecting that, rather consistently across the three years of study, students on the average used about a third of the 41 categories of aspect knowledge coded.

Comparing Abundance of Articulated Knowledge at Each Year of Study

To try to determine the abundance of student correct knowledge of principles and rules, a percentage score reflecting by year average correct principle and rule use across the nineteen decision points was calculated. Those averages were as follows:

third year---.876; fourth year—1.01; fifth year:---.933.

Comparing Aggregate Principle and Rule Articulation at Each Year of Study

To try to ascertain whether student articulation of principles and rules in the aggregate (total number of aspectual principles, teacher and textbook rules and student-generated rules they invoked) changed from one year of study to the next, a one-way ANOVA was carried out on their aggregate principle and rule score. The cell means and results of the ANOVA for this measure are presented in Table 14.

Table 14

Student Year of Spanish Study Descriptive Statistics and ANOVA Testing Effect of Year of Study on Aggregate Principle and Rule Articulation

Year of Study	N	Mean	Standard Deviation
Year 3	53	17.626	4.507
Year 4	42	21.690	6.178
Year 5	41	18.8537	4.373

	SS	df	MS	F	P
Between	396.949	2	198.475	7.795	.001
Within	3386.551	133	25.463		
Total	3783.500	135			

As indicated in Table 14, year of study did show a significant effect. Pair-wise post-hoc comparisons revealed that the fourth-year students articulated more principles and rules than third-year students: $t(2,133) = 4.067$, $p < .01$. Fourth-year students did not articulate principles and rules in the aggregate more frequently than fifth-year students.

Research Question 2: What are the relations at different levels of study between different types of explicit knowledge about the preterite and the imperfect and conventional preterite and imperfect usage on a grammatical judgment test?

Prior to addressing question 2, it was necessary to determine the effect of learner year of study on grammatical judgment test scores to see if the students' conventional usage scores for

aspect in fact improved with each year of study. Table 15 shows descriptive statistics for grammatical judgment test scores by year of study.

Table 15

Student Year of Study Means and Standard Deviations for Aggregate Preterite and Imperfect Grammatical Judgment Test Scores

Year of Study	N	Mean	Standard Deviation
Year 3	53	15.203	1.773
Year 4	53	15.679	1.868
Year 5	44	15.636	1.773

Table 16 summarizes the results of a one-way ANOVA testing effect of learner year of study on aggregate grammatical judgment test scores.

Table 16

ANOVA on the Effect of Student Year of Spanish Study on Aggregate Grammatical Judgment Test Scores

	SS	df	MS	F	P
Between	7.260	2	3.630	1.157	.317
Within	464.488	148	3.138		
Total	471.748	150			

As indicated in Table 16, there was no learner effect for grammatical judgment test scores. Examination of means shows that students were on the average scoring more than 15 out

of the possible 19 points on the grammatical judgment test at each of the three cross sections examined. That is, given the scaffolding provided by the English-supported procedure used in this study, students did rather well.

Table 17 gives descriptive statistics for conventional preterite usage on the grammatical judgment test.

Table 17

Student Year of Study Means and Standard Deviations for Preterite Grammatical Judgment Test Scores

Year of Study	N	Mean	Standard Deviation
Year 3	54	6.555	1.574
Year 4	53	6.434	1.513
Year 5	44	6.909	1.158

Table 18 summarizes the results of a one-way ANOVA testing effect of student year of study on preterite grammatical judgment test scores.

Table 18

ANOVA on the Effect of Student Year of Spanish Study on Preterite Grammatical Judgment

Test Scores

	SS	df	MS	F	P
Between	5.733	2	2.867	1.378	.255
Within	307.989	148	2.081		
Total	313.722	150			

As indicated in Table 18, there was no significant effect for student year of study on conventional preterite usage on the grammatical judgment test.

Table 19 provides descriptive statistics by year of study for conventional imperfect usage on the grammatical judgment test.

Table 19

Student Year of Study Means and Standard Deviations for Imperfect Grammatical Judgment

Test Scores

Year of Study	N	Mean	Standard Deviation
Year 3	54	8.648	1.854
Year 4	53	9.226	2.006
Year 5	44	8.659	1.940

Table 20 summarizes the results of a one-way ANOVA testing effect of student year of study on imperfect grammatical judgment test scores.

Table 20

ANOVA on the Effect of Student Year of Spanish Study on Imperfect Grammatical Judgment

Test Scores

	SS	df	MS	F	P
Between	11.311	2	5.655	1.512	.224
Within	553.484	148	3.740		
Total	564.795	150			

As shown in Table 20, student year of study exerted no effect on conventional imperfect usage on the grammatical judgment test. In summary, there was no significant effect for student year of Spanish study on either aggregated preterite and imperfect, preterite or imperfect grammatical judgment scores.

Explicit Knowledge of Aspect as Predictor of Grammatical Judgment

Verb Aspect Knowledge in General (Aggregated Across Both Preterite and Imperfect) as

Predictors of Grammatical Judgment Test Scores

To determine relations between students' explicit knowledge and conventional preterite and imperfect usage on a grammatical judgment test, bivariate correlations followed by multiple regressions were carried out. For the regressions, predictors were the three types of verb aspect knowledge in grammatical judgment rationales—articulation of aspectual principles (Principles_{tot}), articulation of teacher and textbook rules (TTRules_{tot}), and articulation of student rules (SRules_{tot})—as well as year of study. The criterion or dependent variable was students' judgment test scores. Table 21 shows the simple bivariate correlations between students' conventional usage score on the grammatical judgment test and these types of knowledge by year of study.

Table 21

Correlations by Year of Study and Across All Years Between Aggregate Preterite and Imperfect Grammatical Judgment Test Scores and Types of Verb Aspect Knowledge in Grammatical Judgment Rationales

	Year 3	Year 4	Year 5	All Years
Indices of aspect knowledge	(n = 44)	(n = 34)	(n = 35)	(n = 113)
Principles _{tot}	-.112	-.226	.347*	.012
TTRules _{tot}	.083	.707***	-.007	.245*
SRules _{tot}	.073	.109	.272	.157

***p < .001, *p < .05

As indicated in Table 21, the articulation of aspectual principles correlated significantly with judgment test conventional usage at the fifth year of study. The direction of the correlation was positive and the magnitude was low. Teacher and textbook rule invocation was found to correlate positively and at a high magnitude with conventional usage on the judgment test for fourth year students. This correlation (teacher and textbook rule articulation and judgment test conventional usage) was also significant when all years of study were aggregated together. The direction for this correlation was positive and its magnitude was low. Student rule use did not correlate significantly with judgment test conventional usage for any year or for the aggregate of all three years of study.

When the three indices of verb aspect knowledge and year of study were regressed against students' judgment test conventional usage score, the overall predictor equation was significant: $F(4, 108) = 4.952, p < .01$. The three types of aspect knowledge collectively accounted for 12% of the variance in grammatical judgments. The Beta weight for aspectual

principles was .263 ($t = 2.485$, $p < .05$), for teacher and textbook rules .411 ($t = 3.933$, $p < .001$), for students rules .298 ($t = 3.055$, $p < .01$) and for year of study .028 ($t = .313$, $p > .05$).

Preterite and Imperfect Aspect Knowledge as Predictors of Grammatical Judgment

The previous analysis examined the association between knowledge types and grammatical judgment test scores for preterite and imperfect aspect in the aggregate. To answer the question of the relation between judgment test conventional usage and different types of explicit knowledge of the preterite and imperfect with more precision, correlations followed by regression analyses were also carried out separately on disaggregate preterite and imperfect grammatical judgment scores and the disaggregate preterite and imperfect types of aspect.

Preterite aspect knowledge as predictor of preterite grammatical judgment test scores.

Table 22 show the results of correlational analyses between preterite judgment test scores and articulation of preterite aspectual principles ($\text{Principles}_{\text{pret}}$), articulation of preterite teacher and textbook rules ($\text{TTRules}_{\text{pret}}$), and articulation of preterite student rules ($\text{SRules}_{\text{pret}}$)--at each year of study and in the aggregate.

Table 22

Correlations by Year of Study and Across All Years Between Preterite Grammatical Judgment Test Scores and Types of Preterite Aspect Knowledge in Grammatical Judgment Rationales

	Year 3	Year 4	Year 5	All Years
Preterite subindices	($n = 44$)	($n = 34$)	($n = 35$)	($n = 113$)
$\text{Principles}_{\text{pret}}$.334*	.063	.029	.173
$\text{TTRules}_{\text{pret}}$	-.096	.310	.310	.130
$\text{SRules}_{\text{pret}}$.425**	.243	.084	.273**

** $p < .01$, * $p < .05$

As indicated in Table 22, the invocation of preterite aspectual principles correlated significantly with conventional preterite usage on the judgment test for third year students. This correlation was positive in direction and its magnitude was moderate. The articulation of preterite student rules was found to correlate significantly with preterite judgment scores at the third year of study and across all years of study. These correlations were also positive in direction and of low magnitude. No preterite knowledge type correlated significantly with preterite judgment scores for fifth year students. Teacher and textbook rules showed no significant correlations with any of the preterite knowledge types at any year of study or across all years.

Multiple regressions on the types of preterite aspect knowledge and year of study against preterite conventional usage on the judgment test showed that the overall predictor equation was significant: $F(4,108) = 8.067, p < .05$. These four variables collectively accounted for 23% of the variance in preterite judgment scores. The Beta weight for preterite aspectual principles was .347 ($t = 3.576, p < .05$), for preterite teacher and textbook rules .384 ($t = 3.772, p < .05$), for preterite student rules .371 ($t = 4.190, p < .05$) and for year of study .125 ($t = 1.423, p > .05$).

Imperfect aspect knowledge as predictor of imperfect grammatical judgment test scores.

Table 23 shows correlations between articulation of imperfect aspectual principles ($\text{Principles}_{\text{imp}}$), articulation of imperfect teacher and textbook rules ($\text{TTRules}_{\text{imp}}$), and articulation of imperfect student rules ($\text{SRules}_{\text{imp}}$) and imperfect judgment test scores at each year of study and with the aggregate of all years.

Table 23

Correlations by Year of Study and Across All Years Between Imperfect Grammatical Judgment Test Scores and Types of Imperfect Aspect Knowledge in Grammatical Judgment Rationales

	Year 3	Year 4	Year 5	All Years
	(n = 44)	(n = 34)	(n = 35)	(n = 113)
Imperfect subindices				
Principles _{imp}	.160	-.074	.258	.129
TTRules _{imp}	.425**	.420*	.074	.329**
SRules _{imp}	-.041	.049	.424*	.141

***p < .001, **p < .01, *p < .05

As indicated in Table 23, the articulation of imperfect teacher and textbook rules correlated significantly with imperfect grammatical judgment usage at the third and fourth years of study and for the aggregated of all years of study. This association was not statistically significant for fifth-year students. All these correlations were positive in direction and low in magnitude. The articulation of student imperfect rules and imperfect grammatical judgment usage were found to correlate positively and at a low magnitude at the fifth year of study. The articulation of imperfect principles did not correlate significantly with imperfect judgment usage at any year of study or for the aggregated of all years of study.

When the types of imperfect aspect knowledge and year of study were regressed against students' judgment test scores, the overall predictor equation was significant: $F(4, 108) = 7.060$, $p < .0001$. These four variables explained 21% of the variance in student performance on the test. The Beta weight for imperfect aspectual principles was .247 ($t = 2.7592$, $p < .01$), for imperfect teacher and textbook rules .497 ($t = 4.559$, $p < .000$), for imperfect student rules .262 ($t = 2.920$, $p < .01$) and for year of study $-.082$ ($t = -.950$, $p > .05$).

Other Categories as Predictors of Grammatical Judgment

While the *other* categories were not rules or principles and thus not within the three main types of aspect knowledge, interest in idiosyncratic rules as a form of rules dictated that *other* categories be correlated with judgment test scores. Table 24 shows correlations between aggregate preterite and imperfect usage on the judgment test and *other* categories of rationales.

Table 24

Correlations by Year of Study and Across All Years Between Aggregate Preterite and Imperfect Grammatical Judgment Test Scores and *Other* Categories

	Year 3	Year 4	Year 5	All Years
Other categories	(n = 44)	(n = 34)	(n = 35)	(n = 113)
Idiosyncratic (Category 39)	.129	-.617*	-.274	-.210*
Sounded/seems right (Category 40)	.021	.263	-.042	.058
Uncodeable (Category 41)	-.221	-.088	.178	-.043

**p < .01, *p < .05

As indicated in Table 24, idiosyncratic knowledge correlated significantly with judgment test scores at the fourth year of study and for the aggregate of all years. The direction of both these correlations was negative; in the case of year four the magnitude was moderate, and for the aggregate of all years of study it was low.

Multiple regression analyses on *other* categories and year of study against students' grammatical judgment scores showed that the overall predictor equation was not significant:

$F(4,108) = 1.500, p > .05$. These variables accounted for only 5% of the variance on the judgment test. The Beta weight for idiosyncratic was $-.212 (t = -2.242, p < .05)$ for sounded/seemed right $.033 (t = .347, p > .05)$, for uncodeable $-.060 (t = -.640, p > .05)$ and for year of study $.058 (t = 611, p > .05)$.

Confidence Ratings as Predictor of Grammatical Judgments

To determine the role, if any, that students' confidence in their grammatical judgments played in their conventional preterite and imperfect usage, students' judgment test confidence scores were correlated with their judgment test conventional usage score at each year of study and for the aggregate of all years of study. Students' confidence scores and year of study were also regressed against their grammatical judgment scores. Table 25 shows the results of the correlational analyses.

Table 25

Correlations by Year of Study and Across All Years Between Grammatical Judgment Confidence Scores and Aggregate Grammatical Judgment Scores

	Year 3	Year	Year 5	All Years
Judgment test confidence scores	.086	.379**	.387**	.287**

** $p < .01$

As Table 25 shows, students' grammatical judgment test confidence scores correlated with their judgment test conventional usage score at every year of study, except for year three. Confidence also correlated significantly with conventional usage for the aggregate of all years of study. The direction of these correlations was positive and their magnitude was low.

When judgment test confidence index and year of study were regressed against students' judgment test conventional usage score, the overall predictor equation was significant: $F(4,148) = 7.164, p < .001$. These variables accounted for 9% of the variance. The Beta weight for confidence scores was .280 ($t = 3.553, p < .01$) and for year of study, .079 ($t = 1.001, p > .05$).

Concerning the pattern of usage of the confidence scale, frequency statistics showed that students used each of the middle and upper ratings 5- 10 at least twice as much as they did each of the lower ratings 1-4. The only exception was rating 6, which was used only a third more than rating 4. Students used ratings 1 and 2 very infrequently, only .9 % and .2 % of the time, respectively. In short, they rarely appeared to show low levels of confidence, and the relatively high average confidence ratings appear to be a consensus among participants, rather than the result of a few very high scores pulling up the average.

Question 3: What are the relations between different types of explicit knowledge about the preterite and the imperfect and accuracy, frequency and variability in the production of the preterite and imperfect at different levels of study?

Prior to addressing Research question 3, it was desirable to obtain descriptive information regarding verb production in spontaneous writing. Previous literature provides no such information about the degree to which Spanish learners at different years of study actually produce preterite or imperfect forms, nor about the degree to which preterite/imperfect production frequency and accuracy increase when students have the opportunity to write in untimed, open-ended settings as opposed to test-like and timed situations. Accordingly, a series of two-way repeated measures ANOVAs were performed. These were 3 (level of study) x 2

(writing situation) mixed factorial ANOVAs, in which participants were nested in level of study (levels three, four, or five) and crossed with the repeated measure writing tasks (timed in class or untimed at home). Separate univariate ANOVAs were run for each of the following six dependent variables reflecting accuracy in production (i.e., in plausible sentence contexts), frequency of production (i.e., verb attempts, whether appropriate or not), and diversity of verb aspect production with respect to preterite and imperfect verbs:

- 1) plausible aspect production (aggregated preterite and imperfect)
- 2) plausible preterite production
- 3) plausible imperfect production
- 4) attempted preterite production (plausible plus implausible production of preterite forms)
- 5) attempted imperfect production
- 6) aspect variability index (ratio of preterite to preterite + imperfect)

Table 26 presents descriptive statistics, and Table 27 shows the results for the repeated measures ANOVA on the writing task production variables.

Table 26

Student Year of Spanish Study Means and Standard Deviations for Verb Aspect Production

Indices by Writing Situation

Plausible aspect				Plausible preterite				Plausible imperfect			
Year	n	In	Out	Year	n	In	Out	Year	n	In	Out
		class	class			class	class			class	class
Y3	43	.5974	.6697	Y3	43	.4235	.4724	Y3	43	.1739	.1973
		(.2302)	(.1853)			(.1917)	(.1897)			(.1515)	(.1699)
Y4	26	.6712	.5959	Y4	26	.4046	.3778	Y4	26	.2666	.2180
		(.2217)	(.1986)			(.1197)	(.1875)			(.1991)	(.1909)
Y5	24	.6151	.6447	Y5	24	.4391	.4868	Y5	24	.1760	.1579
		(.2187)	(.2271)			(.1726)	(.1761)			(.1517)	(.1443)
Total	93	.6226	.6426	Total	93	.4222	.4497	Total	93	.2003	.1929
Attempted preterite				Attempted imperfect				Variability index			
Year	n	In	Out	Year	n	In	Out	Year	n	In	Out
		class	class			class	class			class	class
Y3	43	.5373	.5855	Y3	43	.2181	.2231	Y3	43	5.868	8.735
		(.198)	(.216)			(.180)	(.185)			(7.04)	(18.6)
Y4	25	.4717	.4613	Y4	26	.2895	.2377	Y4	26	8.869	7.385
		(.229)	(.245)			(.226)	(.210)			(9.99)	(10.38)
Y5	24	.5423	.5575	Y5	24	.2325	.2145	Y5	24	6.120	5.331
		(.213)	(.197)			(.176)	(.175)			(5.13)	(4.40)
Total	92	.5205	.5437	Total	93	.2420	.2250	Total	93	6.772	7.479

Table 27

Summary of Year of Study by Writing Situation Repeated Measure ANOVAs of Six
Dependent Variables Reflecting Written Production of Preterite and Imperfect Verb
Forms

Plausible aspect production				
Source	df	SS	MS	F
Between groups				
Level	2	.0469	.0234	.004
Error	90	5.033	.0559	
Within groups				
Writing task	1	.0341	.0341	.098
Level X writing task	2	.178	.0891	2.560
Error	90	3.314	.0348	
Plausible preterite production				
Source	df	SS	MS	F
Between groups				
Level	2	.151	.0575	1.574
Error	90	4.330	.0481	
Within groups				
Writing task	1	.0235	.0235	1.125
Level X writing task	2	.0530	.0265	1.265
Error	90	1.887	.0209	

Plausible imperfect production

Between groups

Level	2	.161	.0806	1.888
Error	90	3.844	.0427	

Within groups

Writing task	1	.0904	.0904	.641
Level by writing task	2	.0438	.0219	1.554
Error	90	1.271	.0141	

Attempted preterite production

Between groups

Level	2	.314	.157	2.058
Error	91	6.931	.0761	

Within groups

Writing task	1	.0138	.0138	.819
Level by writing task	2	.0288	.0144	.853
Error	91	1.537	.0168	

Attempted imperfect production

Between groups

Level	2	.0652	.0326	.564
Error	91	5.264	.0578	

Within groups

Writing task	1	.0282	.0208	1.325
Level by writing task	2	.0258	.0125	.821
Error	91	1.429	.0157	

Aspect variability index

Between groups

Level	2	148.853	74.427	.514
Error	90	13034.81	144.831	

Within groups

Writing task	1	1.713	1.713	.016
Level by writing task	2	189.614	94.807	.866
Error	90	9852.470	109.472	

As Table 27 indicates, there were no significant differences attributable to year of study nor for writing task on production of plausible preterite or imperfect written production, nor for attempted preterite or imperfect written production, nor for production of variability in aspect .

Explicit Knowledge of Aspect as Predictor of Plausible Aspectual Production in Writing
Impact of Verb Aspect Knowledge on Plausible Aspectual Verb Production (Aggregated Across
Both Preterite and Imperfect)

To examine the relations between students' preterite and imperfect written accuracy in production and their explicit knowledge of aspect reflected in grammatical judgment rationales, plausible aspect production (aggregated preterite and imperfect) was correlated with the major types of verb aspect knowledge in grammatical judgment rationales---articulation of aspectual principles, articulation of teacher and textbook rules, articulation of student rule---at each year of study and across all years of study. These correlations were followed by multiple regressions in which the three types of verb aspect knowledge, along with year of study, were employed as predictors of plausible aspect production in writing.

Table 28 shows the correlations by year of study and writing task between plausible aspect production and the types of verb aspect knowledge reflected in grammatical judgment rationales.

Table 28

Correlations by Year of Study and Across All Years Between Plausible Aspect Production by Writing Task and Types of Verb Aspect Knowledge

		Plausible aspect production							
		Year 3		Year 4		Year 5		All Years	
		In	Out	In	Out	In	Out	In	Out
		class	class	class	class	class	class	class	class
Principles _{tot}		.069	-.110	.097	-.239	.089	.197	.063	-.028
		(n/50)	(n/42)	(n/42)	(n/22)	(n/34)	(n/21)	(n/126)	(n/85)
TTRules _{tot}		.405**	.063	.175	.157	.402*	.040	.314**	.053
		(n/50)	(n/42)	(n/42)	(n/22)	(n/34)	(n/21)	(n/126)	(n/85)
SRules _{tot}		.028	-.159	.188	-.171	.052	-.072	.101	-.149
		(n/50)	(n/42)	(n/42)	(n/22)	(n/34)	(n/21)	(n/126)	(n/85)

**p < .01, *p < .05

As shown in Table 28, all the significant correlations were between plausible aspect production and teacher and textbook rules for in-class writing. These correlations came at the third and fifth years of study and in the aggregate of all years of study. All were positive in direction and of low magnitude.

When the three types of verb aspect knowledge along with year of study were regressed against students' plausible in -class aspect production, the overall predictor equation was significant: $F(4,123) = 4.854, p < .05$). These indices explained 14% of the variance. The Beta weight for aspectual principles was .055 ($t = .645, p > .05$), for teacher and textbook rule .344 (t

= 3.922, $p < .05$), for student rules .035 ($t = .404$, $p > .05$) and for year of study .027 ($t = .322$, $p > .05$).

In contrast, multiple regression analyses on the types of verb aspect knowledge and year of study against students' plausible out-of-class aspect production showed that the overall predictor equation was non-significant: $F(4,80) = .747$, $p > .05$). These indices explained only 3.6 % of the variance. The Beta weight for aspectual principles was -.022 ($t = -.274$, $p > .05$), for teacher and textbook rules .116 ($t = 1.006$, $p > .05$), for student rules -.180 ($t = -1.530$, $p > .05$) and for year of study -.032 ($t = -.274$, $p > .05$).

Impact of Preterite and Imperfect Aspect Imperfect Knowledge on Plausible Preterite and Imperfect Verb Production

The prior analysis aggregated across plausible preterite and imperfect production in students' in-class and out-of-class writing. This analysis, on the other hand, concerns disaggregated preterite and imperfect production. To answer with more detail and precision question 3 concerning the relations between plausible preterite and imperfect production and explicit knowledge of the preterite and imperfect, students' plausible preterite written production was correlated with the types of knowledge related to the preterite in grammatical judgment rationales—articulation of preterite aspectual principles, articulation of preterite teacher and textbook rules and articulation of student-generated preterite rules. Likewise, students' plausible imperfect written production was correlated with the types of knowledge related to the imperfect in grammatical judgment rationales—articulation of imperfect aspectual principles, articulation of imperfect teacher and textbook rules and articulation of student-generated imperfect rules. Multiple regressions were also carried out on (1) preterite subindices along with year of study

against plausible preterite production and (2) imperfect subindices along with year of study against plausible imperfect production.

Impact of preterite aspect knowledge on plausible preterite verb production. Table 29 shows the correlations by year of study and writing task between students' plausible preterite production and the types of preterite aspect knowledge as reflected in grammatical judgment rationales.

Table 29

Correlations by Year of Study and Across All Years Between Plausible Preterite Production by Writing Task and Types of Preterite Aspect Knowledge in Grammatical Judgment Rationales

	Plausible preterite production							
	Year 3		Year 4		Year 5		All Years	
	In	Out	In	Out	In	Out	In	Out
	class	class	class	class	class	class	class	class
Principles _{pret}	-.119	.128	.001	.020	.191	.182	.091	.006
	(n /49)	(n /42)	(n/40)	(n /22)	(n/ 32)	(n /21)	(n/121)	(n /85)
TTRules _{pret}	.114	.088	-.181	-.483*	.115	.208	.024	-.100
	(n /49)	(n /42)	(n/40)	(n /22)	(n/ 32)	(n /21)	(n/121)	(n /85)
SRules _{pret}	.142	-.074	-.053	-.064	.033	.217	.050	-.019
	(n /49)	(n /42)	(n/40)	(n /22)	(n/ 32)	(n /21)	(n/121)	(n /85)

*p < .05

As indicated in Table 29, the only type of preterite aspect knowledge that showed a significant correlation with plausible preterite production was the articulation of teacher and textbook preterite rules. Plausible preterite production correlated at a low magnitude and negatively with plausible out-of-class preterite usage for fourth-year students.

When the types of preterite aspect knowledge along with year of study were regressed against students' in-class plausible preterite production, the overall predictor equation was not significant: $F(4, 116) = .432, p > .05$. These types of knowledge and year of study explained only 1.5% of the variance. The Beta weight for preterite aspectual principles was .084 ($t = .873, p > .05$), for preterite teacher and textbook rules .028 ($t = .291, p > .05$), for preterite student rules .028 ($t = .296, p > .05$) and for year of study .068 ($t = .719, p > .05$).

Similarly, the overall predictor equation was also found nonsignificant for multiple regression of preterite subindices and year of study against students' out-of-class plausible preterite production: $F(4, 80) = .228, p > .05$. These subindices explained only 1% of the variance. The Beta weight for preterite aspectual principle was -.004 ($t = -.037, p > .05$), preterite teacher and textbook rules was -.107 ($t = -.931, p > .05$), for preterite student rules -.007 ($t = -.063, p > .05$) and for year of study .037 ($t = .312, p > .05$).

Impact of imperfect aspect knowledge on plausible imperfect verb production. Table 30 shows the correlations between students' plausible imperfect written production and the types of imperfect aspect knowledge expressed in grammatical judgment rationales by year of study and in the aggregate.

Table 30

Correlations by Year of Study and Across All Years Between Plausible Imperfect Production by Writing Task and Types of Imperfect Aspect Knowledge in Grammatical Judgment Rationales

	Plausible imperfect production							
	Year 3		Year 4		Year 5		All Years	
	In	Out	In	Out	In	Out	In	Out
	class	class	class	class	class	class	class	class
Principles _{imp}	.136	.465	-.211	-.137	.256	.231	.049	.125
	(n/41)	(n/30)	(n/31)	(n/17)	(n/29)	(n/15)	(n/99)	(n/62)
TTRules _{imp}	.219	.266	.204	.481	.355	-.014	.210*	.269*
	(n/41)	(n/30)	(n/31)	(n/17)	(n/29)	(n/15)	(n/99)	(n/62)
SRules _{imp}	-.035	.063	.576**	-.189	-.083	.348	.175	-.130
	(n/41)	(n/30)	(n/31)	(n/17)	(n/29)	(n/15)	(n/99)	(n/62)

**p < .01, *p < .05

Table 30 shows that for in-class writing the articulation of imperfect student rules correlated positively and moderately with plausible in-class imperfect production at the fourth year of study. For the aggregate of all years of study the articulation of imperfect teacher and textbook rules correlated significantly with in-class plausible imperfect production. This correlation was positive in direction and of low magnitude. Imperfect aspect knowledge subindices showed no significant correlations with in-class plausible imperfect production for third- and fifth-year students.

Table 30 also reveals that only one imperfect aspect knowledge type correlated significantly with out-of-class plausible imperfect production. For the aggregate of all years of study, articulation of imperfect teacher and textbook rules correlated significantly with out-of-class plausible imperfect production. The direction of this correlation was positive and the magnitude was low.

When the types of imperfect knowledge and year of study were regressed against students' in-class imperfect production, the overall predictor equation was not significant: $F(4,94) = 1.766, p > .05$. These knowledge types and year of study accounted for only 7% of the variance. The Beta weight for imperfect aspectual principles was .024 ($t = .244, p > .05$), for imperfect teacher and textbook rules .195 ($t = 1.929, p < .05$), for imperfect student rules .148 ($t = 1.441, p > .05$) and for year of study -.006 ($t = -.060, p > .05$).

In contrast, multiple regression of the imperfect subindices along with year of study against students' out-of-class plausible imperfect production did yield a significant overall predictor equation: $F(4,57) = 2.619, p < .05$. These subindices and year of study accounted for 15.5% of the variance. The Beta weight for imperfect aspectual principles was .119 ($t = .960, p > .05$), for imperfect teacher and textbook rules .319 ($t = 2.522, p < .05$), for imperfect student rules -.175 ($t = -1.376, p > .05$) and for year of study -.187 ($t = -1.486, p > .05$).

Impact of Verb Aspect Knowledge on Frequency of Aspectual Verb Production in Writing

Impact of Verb Aspect Knowledge in General (Aggregated Across Both Preterite and Imperfect) on Attempted Aspectual Verb Production

Attempted aspect production is the sum of both plausible and implausible production. Thus, it reflects not only correct production but frequency of correct along with incorrect verb usage. It is a measure of a student's willingness to deploy each type of aspect, even if imperfectly. To determine if relations exists between frequency in production and verb aspect knowledge in grammatical judgment rationales, correlations between attempted aspect production (aggregate preterite and imperfect) and the articulation of aspectual principles, the articulation of teacher and textbook rules and the articulation of student-generated rules were carried out for each writing task at each year of study and across all years of study. Multiple regressions were also conducted and separately for in-class and out-of-class writing tasks.

Table 31 presents the results of correlations by year of study and writing task between attempted aspect production and the types of verb aspect knowledge reflected in grammatical judgment rationales.

Table 31

Correlations by Year of Study and Across All Years Between Attempted Aspect Production by Writing Tasks and the Types of Verb Aspect Knowledge in Grammatical Judgment Rationales

	Attempted aspect production							
	Year 3		Year 4		Year 5		All Years	
	In	Out	In	Out	In	Out	In	Out
	class	class	class	class	class	class	class	class
Principles _{tot}	.111	-.061	.148	-.120	.073	.364	.125	.043
	(n/51)	(n/42)	(n/43)	(n/22)	(n/34)	(n/21)	(n/128)	(n/85)
TTRules _{tot}	.260	.062	.301	-.146	.230	-.129	.269*	-.060
	(n/51)	(n/42)	(n/43)	(n/22)	(n/34)	(n/21)	(n/128)	(n/85)
SRules _{tot}	.031	-.107	.237	-.181	-.145	-.061	.083	-.128
	(n/51)	(n/42)	(n/43)	(n/22)	(n/34)	(n/21)	(n/128)	(n/85)

*p < .05

As indicated in Table 31, only one type of aspect verb knowledge in grammatical judgment rationales correlated significantly with attempted aspect production: as an aggregate across all years of study, the articulation of teacher and textbook rules correlated with out-of-class attempted aspect production. The direction of the correlation was positive and the magnitude was low.

When the three types of verb aspect knowledge and year of study were regressed against students' attempted in-class aspect production, the overall predictor equation was significant: $F(4,123) = 2.793$, $p < .05$. These knowledge types and year of study combined to account for

8.3% of the variance. The Beta weight for aspectual principles was .091 ($t = 1.048$, $p > .05$), for teacher and textbook rules .266 ($t = 32.948$, $p < .01$), for students rules .005 ($t = .058$, $p > .05$) and for year of study -.023 ($t = -.266$, $p > .05$).

Regression analyses on the same aspect knowledge types and year of study against attempted out-of-class aspect production showed the overall predictor equation to be non-significant: $F(4,80) = .720$, $p > .05$). These aspect knowledge types and year of study explained 3.5% of the variance. The Beta weight for aspectual principles was .082 ($t = .726$, $p > .05$), for teacher and textbook rules -.008 ($t = -.070$, $p > .05$), for student rules -.102 ($t = -.866$, $p > .05$) and for year of study -.125 ($t = -1.072$, $p > .05$).

Impact of Preterite and Imperfect Verb Knowledge on Attempted Preterite and Imperfect Verb Production

Whereas the preceding analyses aggregated across attempted preterite and imperfect production, this next analysis focused specifically on disaggregated attempted preterite and imperfect production. To present a more complete picture of attempted aspect production and verb aspect knowledge, students' attempted preterite production was correlated with the three types of preterite aspect knowledge in grammatical judgment rationales---articulation of preterite aspectual principles, articulation of preterite teacher and textbook rules and articulation of preterite student-generated rules. Likewise, students' attempted imperfect production was correlated with types of imperfect aspect knowledge in grammatical judgment rationale---articulation of imperfect aspectual principles, articulation of imperfect teacher and textbook rules and articulation of imperfect student-generated rules. Multiple regressions of (1) the three preterite knowledge types and year of study against attempted preterite production and (2) the

three imperfect knowledge types and year of study against attempted imperfect production were also carried out.

Impact of preterite verb aspect knowledge on attempted preterite production. Table 32 shows the results of correlations by year of study and writing task between attempted preterite written production and types of preterite aspect knowledge expressed in grammatical judgment rationales.

Table 32

Correlations by Year of Study and Across All Years Between Attempted Preterite Production by Writing Task and Types of Preterite Aspect Knowledge in Grammatical Judgment Rationales

	Attempted preterite production							
	Year 3		Year 4		Year 5		All Years	
	In	Out	In	Out	In	Out	In	Out
	class	class	class	class	class	class	class	class
Principles _{pret}	.292*	.025	.205	.079	-.094	.373	.170	.123
	(n/51)	(n/42)	(n/43)	(n/22)	(n/34)	(n/21)	(n/128)	(n/85)
TTRules _{pre}	-.087	.099	.052	-.406	.039	-.321	-.011	-.162
	(n/51)	(n/42)	(n/43)	(n/22)	(n/34)	(n/21)	(n/128)	(n/85)
SRules _{pret}	.151	-.190	.007	-.109	.136	.234	.097	-.064
	(n/51)	(n/42)	(n/43)	(n/22)	(n/34)	(n/21)	(n/128)	(n/85)

*p < .05

As shown in table 32, only the articulation of preterite principles correlated significantly with attempted preterite production. This correlation came at the third year of study for in-class writing. No subindices of preterite aspect knowledge correlated significantly with in-class or out-of-class attempted preterite production for fourth- or fifth-year students or for the aggregate at all years of study.

Multiple regressions of the types of preterite aspect knowledge and year of study against in-class attempted production showed a non-significant result for the overall predictor equation: $F(4,123) = 1.107, p > .05$. These preterite knowledge types and year of study combined explained only 3.5% of the variance. The Beta weight for preterite aspectual principles was .163 ($t = 1.774, p > .05$), for preterite teacher and textbook rules .019 ($t = .203, p > .05$), for preterite student rules .062 ($t = .689, p > .05$) and for year of study -.042 ($t = -.459, p > .05$).

The parallel analysis for out-of-class attempted preterite production similarly failed to attain statistical significance: $F(4,80) = 1.349, p > .05$. These subindices and year of study explained 14% of the variance. The Beta weight for preterite aspectual principles was .167 ($t = 1.433, p > .05$), for preterite teacher and textbook rules -.112 ($t = -1.002, p > .05$), for preterite student rules -.097 ($t = -.865, p > .05$) and for year of study -.141 ($t = -1.235, p > .05$).

Impact of imperfect verb aspect knowledge on attempted imperfect production. Table 33 shows the results of correlations by writing task and year of study between attempted imperfect production and types of imperfect aspect knowledge reflected in grammatical judgment rationales.

Table 33

Correlations by Year of Study and Across All Years Between Attempted Imperfect Production by Writing Task and Types of Imperfect Aspect Knowledge in Grammatical Judgment

Rationales

	Attempted imperfect production							
	Year 3		Year 4		Year 5		Aggregated	
	In	Out	In	Out	In	Out	In	Out
	class	class	class	class	class	class	class	class
Principles _{imp}	.212	.114	-.058	.253	.287	-.281	.144	.052
	(n/51)	(n/42)	(n/43)	(n/22)	(n/34)	(n/21)	(n/128)	(n/85)
TTRules _{imp}	.161	-.005	.367	-.044	-.005	-.089	.208*	-.017
	(n/51)	(n/42)	(n/43)	(n/22)	(n/34)	(n/21)	(n/128)	(n/85)
SRules _{imp}	-.128	-.093	.255	.115	-.106	.086	.042	.062
	(n/51)	(n/42)	(n/43)	(n/22)	(n/34)	(n/21)	(n/128)	(n/85)

*p < .05

As shown in Table 33, imperfect teacher and textbook rules was the only type of verb aspect knowledge in grammatical judgment rationales that correlated significantly with attempted imperfect production. This correlation was significant for the aggregate of all years of study for in-class writing. Its direction was positive and its magnitude was low. At the individual years of study no index of verb aspect knowledge was shown to correlate significantly with either in-class or out-of-class written imperfect production.

When the types of imperfect aspect knowledge and year of study were regressed against in-class total attempted imperfect verb production, the overall predictor equation was not significant: $F(4,123) = 1.913, p > .05$. These variables explain 2.8% of the variance. The Beta weight for imperfect principles was .120 ($t = .120, p > .05$), for imperfect teacher and textbook rules .193 ($t = 2.133, p < .05$), for imperfect students rules -.004 ($t = -.039, p > .05$) and for year of study .027 ($t = .305, p > .05$).

Multiple regression of the imperfect subindices and year of study against out-of-class total attempted imperfect verb production showed a non-significant result for the overall predictor equation: $F(4,80) = .503, p > .05$. These imperfect knowledge types and year of study accounted for 2.5 % of the variance. The Beta weight for imperfect aspectual principles was .038 ($t = .339, p > .05$), for imperfect teacher and textbook rules -.046 ($t = -.397, p > .05$), for imperfect student rules .047 ($t = .401, p > .05$) and for year of study .131 ($t = 1.143, p > .05$).

Impact of Verb Aspect Knowledge on Variability in Aspect Production

Impact of Verb Aspect Knowledge in General (Aggregated Across Both Preterite and Imperfect) on Variability of Aspect Production

To ascertain if there was a relation between diversity in verb aspect production (i.e., producing a more equal number of preterite and imperfect verb forms) and verb aspect knowledge (aggregated preterite and imperfect) in grammatical judgment rationales, correlations were carried out on students' variability in production index and articulation of aspectual principles, articulation of teacher and textbook rules and articulation of student-generated rules by student year of study and writing task. Multiple regressions were also performed on these three types of general verb aspectual knowledge and year of study against students' variability index for each writing task. Table 34 shows the correlations.

Table 34

Correlations by Year of Study and Across All Years Between Variability in Production Score by Writing Task and Types of Verb Aspect Knowledge in Grammatical Judgment Rationales

	Variability in Production							
	Year 3		Year 4		Year 5		All Years	
	In	Out	In	Out	In	Out	In	Out
	class	class	class	class	class	class	class	class
Principles _{tot}	-.143	-.028	-.128	-.176	-.186	-.173	-.140	-.079
	(n/51)	(n/42)	(n/44)	(n/22)	(n/34)	(n/21)	(n/129)	(n/85)
TTRules _{tot}	.199	.113	.454*	.265	-.154	.024	.259**	.123
	(n/51)	(n/42)	(n/44)	(n/22)	(n/34)	(n/21)	(n/129)	(n/85)
SRules _{tot}	-.116	-.067	.148	-.070	.132	.055	.049	-.046
	(n/51)	(n/42)	(n/44)	(n/22)	(n/34)	(n/21)	(n/129)	(n/85)

**p < .01, *p < .05

As indicated in Table 34, all the significant correlations were between teacher and textbook rules and in-class variability in production. These correlations occurred at the fourth year of study and in the aggregate of all years. Both these correlations were positive in direction and low in magnitude.

When the types of verb aspect knowledge in grammatical judgment rationales and year of study were regressed against students' in-class variability in production score, the overall predictor equation was found to be significant: $F(4,124) = 3.298$, $p < .05$. These indices and year of study collectively accounted for 9.6 % of the variance. The Beta weight for aspectual

principles was $-.167$ ($t = -1.941$, $p > .05$), for teacher and textbook rules $.284$ ($t = 3.172$, $p < .01$), for student rules $-.021$ ($t = -.235$, $p > .05$) and for year of study $-.017$ ($t = -.200$, $p > .05$).

For the same knowledge types and year of study regressed against students' out-of-class variability in production score, the overall predictor equation was, conversely, not significant: $F(4,80) = .730$, $p > .05$. These types of knowledge and year of study combined explained 3.5% of the variance. The Beta weight for aspectual principles was $-.077$ ($t = -.678$, $p > .05$), for teacher and textbook rules $-.077$ ($t = -.678$, $p > .05$), for student rules $-.083$ ($t = -.704$, $p > .05$) and for year of study $-.067$ ($t = -.578$, $p > .05$).

In the next chapter, chapter 5, I will summarize the findings from chapter 4 and discuss the significance and implications of the findings. I will also discuss further research these findings suggest.

CHAPTER 5

DISCUSSION

Overview of Study and Findings

This research study was designed to investigate, in general, students' explicit knowledge of perfective and imperfective aspect, and specifically whether that knowledge tends to be more case specific---that is, based on erratically-applicable rules---or more based on abstract aspectual principles. This study also examined relations between aspect knowledge type (rule versus principle) and actual performance in both discerning appropriate verb choice and in actively producing the preterite and imperfect in Spanish. Toward these ends third-, fourth- and fifth-year secondary Spanish students took a computer-assisted grammatical judgment test over the preterite and imperfect. The design of this test was unique in that the story was first presented in English in its entirety and then in English again but with the corresponding Spanish preterite and imperfect verb forms provided in a pull-down menu. This design assured that no other aspects of foreign language knowledge were confounded with the test of verb aspect. Once students had finished the judgment test, they rated their confidence in their answers and then gave a rationale for each of their aspectual choices. Later students wrote both an in-class and an out-of-out-class description of a favorite movie or TV episode in the past tense.

The methodology used for the grammatical judgment test proved to be quite effective. It showed that when sources of knowledge not related to aspect are eliminated through the use of technology and a story matrix in English, students perform well on a test of their preterite and imperfect knowledge. Over all, student responses were about 81% correct (conventional usage)

on the judgment test, which hardly comports with previous reports of the enormous difficulty students have with verb aspect in Spanish. Moreover, since students at all three years of study scored at this same high level, it appears that even students with more limited experience and practice with the language can demonstrate their knowledge of aspect under circumstance like these of maximum support.

In a related vein, several findings in this study point to the conclusion that students as early as the third year of study (their second year of study of the preterite and imperfect) have rather powerful access to explicit knowledge about verb aspect in Spanish. Thus, this study contradicted previous findings that students, especially, beginning students, articulate poorly explicit knowledge of grammar in foreign language study (Green and Hecht, 1992; Sorace, 1983).

One of the surprises of the study was that quite a bit of student knowledge consisted of self-generated rules that were quite uniform and at least occasionally serviceable. They were student generated in that they never appeared in the knowledge base found in textbooks or in teachers' own formulations. Thus, students derived these rules for themselves. An example of such a student-generated rule was *Spanish equivalent of English simple past*. Through these student-generated rules, students showed creativity and invention in trying to induce the patterns of a language. These rules were at times helpful, though at other times they led to mistakes. Most important, the finding of student-generated rules supports a more constructivist notion of education, of students taking what they are taught, filtering it through the lens of their own thinking and converting it into personally-useful knowledge (Lantolf and Yanez, 2003; Hall, 2002).

The clearest finding emerging from this study is that students' explicit knowledge of the preterite and imperfect was primarily teacher- and textbook-rule based, rather than based on more abstract and overarching principles. Rules in this sense are shortcuts that can function as helpful problem-solving heuristics (Kahneman, et al., 1982) but which do not necessarily reflect the underlying linguistic principles. The dominance of the teacher and textbook rule knowledge base did not diminish as students progressed into higher levels of study. The strategies learners employed, that is, the size of the repertoire of different categories of aspect knowledge they articulated, also remained unchanged throughout their years of study.

One of the few developmental findings emerging from this study was anomalous. In regard to total correct principles and rule production, however, fourth-year students did articulate principles and rules with greater frequency than did third-year students. It is odd that this distinction belonged to the fourth-year students rather than to the more advanced fifth-year students, and the explanation may very well lie with factors peculiar to the particular sample of students. On the other hand, it does make sense to speculate that perhaps at the fourth year of study students expanded their repertoire of aspectual rules and principles, and then with yet additional experience, they contracted their functional repertoires to contain just those rules and principles that proved most efficient.

Rules are more concrete and situation specific than principles, as operationalized in this study and elsewhere (Frantzen, 1995). The invariant dominance of teacher and textbook rules is therefore consistent with the conclusion that students at these levels of language learning seek the certainty of concrete prescriptions; the more case specific the rule, the more often it was applied. This preference for concrete rules of thumb over abstract linguistic principles is not surprising given the difficulty of the topic (Whitley, 1986; Hulstijn, 1995). While, according to

Piaget (1954), students of this age are cognitively within the formal operations stage in which they can think and process more abstractly, the difficulty of the topic may require that they use the more concrete thinking of an earlier stage of development; they are not experienced enough with the topic to think abstractly about it.

Teacher and textbook rules---as compared with more abstract and linguistically-sophisticated principles or students' own invented rules ---were over all the best predictor of conventional, appropriate preterite and imperfect verb selection on a grammatical judgment test and also the best predictor of aspectual verb production in in-class, timed, spontaneous writing. Curiously, on the other hand, when writing in a presumably untimed situation outside of class, knowledge of aspect rules exerted no impact on verb production. Why would the in-class writing task show evidence of the impact of explicit knowledge and the out-of-class writing task not do the same? This was a particularly surprising finding because typically timed, in-class writing is thought to draw upon available *implicit* knowledge, whereas the relative freedom from time constraints of out-of-class writing is thought to allow the luxury of drawing upon slower-to-access explicit knowledge (Bialystok, 1979; R. Ellis, 1994). Perhaps language use in homework writing tasks in the case of this study was less dependent on explicit grammatical knowledge because the students had more external resources to draw upon in homework (notes, models, older siblings) than in supervised, in-class writing. Thus, their home writing could be less likely to manifest the impact of linguistic knowledge of any kind—explicit or implicit. It must be remembered, though, that this study cannot establish a direct cause-effect relation between explicit knowledge and competence or performance. That is, the design of this study cannot establish that explicit knowledge causes, or is necessary for, competence for performance. Other

factors outside the scope of this study (e.g., metalinguistic awareness, motivation) may underlie many of these relations.

Knowledge of linguistically-sophisticated aspectual principles did affect performance for the advanced fifth-year students on the judgment test. Those advanced students who rationalized their verb choices in terms of such abstract principles indeed performed especially well on the grammatical judgment test, while their classmates who rarely invoked abstract principles tended to do more poorly on the test. At this level, as Gass (1983) would concur, students who were most proficient in using their linguistic knowledge were the ones who were most proficient in stating the knowledge in public. Another finding of the study was that a knowledge of preterite aspectual principles encouraged third-year students to attempt more preterite verb forms in their writing. This finding indicates that at the beginning and lower years of study of aspect, knowing preterite aspectual principles gives students greater confidence to attempt to produce the preterite.

Research Question 1: What are the explicit contents of instructed learners' knowledge of the preterite and the imperfect for students at different levels of study?

Are they more rule based or principle based?

How abundant are these contents and do they become more abundant at higher levels of proficiency?

How proficient are students at restating verbatim the rules they have been taught?

The most dramatic finding regarding knowledge reflected in student rationales for verb choice was the preponderance of teacher- and textbook-rule-based knowledge at and across all

years of study. Rules, as compared with principles, make reference to concrete situations or lexical contexts or are unreliable half-truths. Teacher and textbook rules were those concrete and situation-specific rules of thumb expressed in the textbooks used by the students in this study or those expressed by their teachers when queried how they teach verb aspect in Spanish. This dominance of rules was most evident in the comparison across the 41 categories of knowledge coded in the rationales. Of the top quartile of categories each student invoked at least once, seven encompassed teacher and textbook rules, whereas only two encompassed more abstract principles; one was an *other* category. In other words, 70% of the students' repertoires of aspectual knowledge was organized primarily around rules. Concerning the nature of these seven rules, all are case-specific rules or rules of thumb, the type that Frantzen (1995) described as half-truths. Students are apparently most comfortable with these rules even though they are half-truths because they are, indeed, case specific. In that way, they are very concrete and easy to apply.

The overall picture presented by results bearing on the first research question is that students at all levels of study favored more concrete and/or case-specific types of knowledge of aspect.

Contents of Explicit Knowledge

Impact of Teacher and Textbook Instruction on Functional Knowledge of Aspect

This preference for more concrete or focused rules over abstract and globally-applicable principles was confirmed by Z tests of proportionality. These tests showed that at each year of study student knowledge was principally teacher- and textbook-rule based. This conclusion was reinforced by the results of the one-way ANOVAs carried out on the three types of aspect knowledge in grammatical judgment rationales: no significant difference among the groups in

their articulation of these three types of knowledge. In short, these cross-sectional analyses indicated that students' explicit knowledge of preterite and imperfect aspect did not change significantly as they practiced more with the preterite and the imperfect. It began rule based and continued rule based as they moved into more advanced levels of study.

The Z tests also showed that fourth-year students invoked student-generated rules with greater frequency than they did aspectual principles, but this finding did not characterize either third- or fifth-year students. That fourth-year students' knowledge was more student rule based than aspectual principle based and yet third year students' was not is the reverse developmental sequence of what one might expect. One would expect that students might use fewer student-generated rules and more sophisticated aspectual principles in higher years of study.

One post-hoc explanation for this differences that did emerge may be that students at lower levels of study who have not practiced as much as with the preterite and imperfect are more likely to stick close to home, that is, to the explanations they have been given by their teachers and have seen in textbooks, which explains why third-year students did not use relatively many student-generated rules. By the fourth year of study, however, students may have felt comfortable venturing out and using some rules of their own making. By the fifth year of study, students may have realized that their own rules were not very efficacious and thus reduced their reliance on rules of their own formulation.

Another confirmation of lack of linear progress in growth of aspectual knowledge derives from the analyses on unused verb categories. This analysis was designed to reveal the size of students' repertoires of knowledge regarding Spanish verb aspect. The pattern of student category use did not change across the three years, that is, students did not narrow down to a few categories nor did they broaden their use of categories. In general students used about one-third

of the 41 categories, and this ratio remained virtually unchanged for the three years of study examined here.

Potential Exposure, Concreteness, and English as Criteria for Student Rule Utilization

The study operationalized potential exposure as an index derived from the number of textbooks examined and the number of teachers interviewed who taught a particular aspectual rule or principle. The supposition behind this index was that the more books and teachers who avowed teaching each rule or principle, the more likely it was for a student to be exposed to that rule or principle.

Table 3 in the results showed correspondence between student knowledge of particular elements of aspect and their potential exposure to each element. For any of these teacher and textbook rules, no more than 36% of the teachers or textbooks provided students exposure, except in the case of imperfect teacher and textbook rule *description*. This particular rule, ranked only 10th out of 41 categories in terms of student invocation, was mentioned by fully 70% of the teachers and/or textbooks. In contrast, students were potentially exposed by only 21% of teachers and/or textbooks to the category students invoked most often: *key words: de niño (as a child), etc.* This contrast between the top-most used invoked category of knowledge and the 10th---even though both are rules---suggests that potential exposure alone cannot account for differential student preference for those rules. Rather, because key words are more concrete than the concept of description, this pattern of responses contributes further to the notion that concreteness---not the vigor with which a rule or principle was taught---was an important determinant of student knowledge utilization.

An examination of the bottom 25% of the categories articulated at least once likewise warrants concreteness as a criterion for the invoking of a rule. This group of relatively unused

categories of knowledge about aspect may have been unused because more concrete rationales were available to students to justify their verb choices. For example, the grammatical judgment test provided potential opportunities for students to invoke *simultaneous action* at decision points 6 (*would try*) and 7 (*would begin*). Instead, students chose primarily to use *would + verb* (category 29), a more concrete and case-specific rule, at these decision points. They also had one opportunity to use *action interrupted*, at decision point 5 (*I thought*), but they chose instead to use *emotion or mental or physical state*, a rule which is also more concrete. *To advance the narrative* and *states and conditions* could have been employed a number of times in the grammatical judgment test. These rules, however, describe situations that are more ambiguous and harder to specify. Consequently, they were very rarely utilized by students. Even when students had potentially received quite a bit of exposure to some of these rules such as *action interrupted* (mentioned by 50% of teacher and texts), and *simultaneous action* (mentioned by 64%), this relatively high degree of potential exposure was not enough to overcome the abstract nature of these rules. They, too, remained largely unused, despite potential student exposure to them.

While students' invoking of rules is a function primarily of concreteness, apparently even an abstract principle or rule will be utilized if students are exposed to it with sufficient intensity. Thus, *the completion of action* is surely not as concrete as highly case-specific rules. However, students received more intense exposure to it than to any other rule or principle: 14 mentions by teachers and in textbooks, a 100% exposure index. The greater degree of exposure overcame its rather limited concreteness, since this rule was one of the few abstract elements to rank high in students' repertoires. The same phenomenon was also true of imperfect principle 4---*action in progress at some focused point in the past*, ranked 14th in invocation. Students had been exposed

to this principle potentially 63% of the time. Again, greater potential exposure to a principle, relatively speaking, overcame its abstract nature.

The bottom quartile of the repertoire rankings offers evidence of the joint impact of both high abstraction and potential low exposure. The two categories least invoked of all 41 categories were the imperfect aspectual principle *repetitious action*, ranked 40th, and the preterite aspectual principle *the beginning of past action*, ranked 41st. Students had had no exposure to *repetitious action* and potentially only 21% exposure to *the beginning of past actions*. At the same time, these two principles are much less concrete than the case-specific rules. These two factors combined to ensure that these principles rarely surfaced in student consciousness.

Concreteness and potential exposure both play a role, then, in the types of knowledge that students most readily articulate about aspect. Yet a third factor emerging from the pattern of responses in the verb choice rationales was similarity with native English verb patterns. The second most-frequently invoked category of knowledge was the student-generated rule *simple past*, followed in turn by the teacher and textbook imperfect rule *Spanish equivalent of was, were + ing*. Teacher and textbook imperfect rule *used to* and teacher and textbook rule *would* were the 13th and 15th most-widely invoked categories, respectively. The consistent invoking of these categories reveals that students frequently relied on English usage as their guide in choosing Spanish verb aspect. Using an English form that had never been given them as a reliable indicator of aspect, as was the case with the student-generated rule *simple past*, underscores their great dependence on English in these decisions. My experience as a classroom Spanish teacher is that even when a paragraph or story is in Spanish, students often use English translations of the Spanish verbs as criteria for aspectual choice.

Abundance and Increase of Aspect Knowledge

Green and Hecht (1992) found that students were not very successful at producing rules; they produced a correct rule only 41% of the time. Correct productions of rules related to aspect were especially rare events in their study. Students in the present study, in contrast, produced approximately one correct rule per decision point in the grammatical judgment test, a figure that suggests that these students were quite proficient at producing principles and rules, as needed. While that figure does contain some overlap, in that students could have been given credit for more than one type of knowledge (up to three) at each decision point, it still remains quite impressive and bespeaks a student population with a sizeable knowledge base.

Gass (1983) and Sorace (1985) found that at beginning levels of study, correct rules were especially hard to come by. This study contradicts that finding, for there were no significant differences between any of the years of study in their articulation of principles or rules. Students did not develop greater explicit knowledge as they moved in higher years of study, nor as indicated earlier, did their strategy of principle and rule articulation change.

Research Question 2: What are the relations at different levels of study between different types of instructed explicit knowledge about the preterite and the imperfect (aspectual based vs. rule based) and conventional preterite and imperfect usage on a grammatical judgment test?

The major finding in relation to this research question was that knowledge of case-specific teacher and textbook rules of thumb was a better predictor of success on the grammatical judgment test than were knowledge of principles, of student-generated rules, or of other categories. This finding is supported by regressions and correlations on these divisions of verb

aspect knowledge. Teacher and textbook rules were found to be quite serviceable, in fact, and more important in verb choice than the aspectual principles central to the paradigm advocating that students be taught more abstract and linguistically defensible notions of aspect (e.g., Frantzen, 1995). Study findings here do suggest, nevertheless, that by the fifth year of study students who had learned to articulate those aspectual principles were deriving some benefit in making aspectual verb choice decisions on a grammatical judgment test. Their classmates who rarely invoked aspectual principles performed relatively poorly on the judgment test.

Articulated Knowledge

Articulated Knowledge, *Other* Categories, Confidence, and Conventional Grammatical Usage Across All Years of Study

Table 35 summarizes in schematic fashion the results of multiple regressions of articulation of aspect knowledge, *other* categories and confidence scores against grammatical judgment scores.

Table 35

Summary of Multiple Regressions of Articulated Knowledge, *Other* Categories and Confidence Scores Against Types of Aspect Knowledge in Grammatical Judgment Rationales

Predictors:	Aggregated aspect knowledge	Preterite knowledge	Imperfect knowledge	<i>Other</i> categories	Confidence score
Overall prediction	Sig	Sig	Sig	NS	Sig

Variance explained	12 %	23 %	18 %	9 %
Beta weights for components	Prin .263 T/T .411 SR .298	Pret prin .347 Pret T/T .384 Pret SR .371	Imp prin .247 Imp T/T .407 Imp SR .262	Confidence .280

Note. Prin: aspectual principles; T/T: teacher and textbook rules; SR: student rules; Pret: preterite; Imp: imperfect

These results show that student knowledge across the board of aspectual principles, teacher and textbook rules and students rules combined were significant predictors of performance on the grammatical judgment test, even though they were not very strong ones. In that regard, this study contradicts earlier research which found little impact of explicit knowledge on competence for use (Alderson et al, 1997; Green and Hecht, 1994; Hulstijn and Hulstijn, 1984; Han and Ellis, 1998; Seliger, 1979). Knowing rules did, indeed, impact student competence in relation to the preterite and imperfect.

Confidence was a significant predictor of preterite and imperfect usage on the grammatical judgment test but perhaps not as strong as one might expect, accounting for less than 10% of the variance in judgment test scores. One might expect that students who had a history of good grades and positive reward in their foreign language classes because of their language proficiency would be the ones who also had high confidence in their test responses. Conversely, those who had low grades and poor class feedback would have low confidence. Because of the likely linkage to school success and feedback, it would be reasonable to expect

that better students who could manage the grammatical judgment task would be most confident. In fact, students were not especially astute in sensing their success or failure on this test.

Articulated Knowledge, *Other* Categories, Confidence and Conventional Grammatical Usage by Year of Study and Across All Years

The regression analyses generalized across year of study. Separate correlations between knowledge types and grammatical judgment test scores at each year of study suggest a more complex picture.

Third-year students who knew more preterite aspectual principles and more preterite student rules used the preterite more accurately on the judgment test. Additionally, students who knew more imperfect teacher and textbook rules performed better on the imperfect portion of the judgment test. These findings suggest that students benefit from both teacher and textbook rules and aspectual principles.

Fourth-year students who knew more teacher and textbook rules in general and more imperfect teacher and textbook rules in particular used the preterite and imperfect more accurately on a judgment test. By the fourth year of Spanish study (their third studying the preterite and the imperfect), students had received a great deal of practice with the preterite and the imperfect and the rules that accompany their use. Those who can articulate and apply these rules were served well by this knowledge; it provided them with a clear framework for making preterite and imperfect verb aspect choices.

It is interesting to note that at the fourth year of study idiosyncratic rule invocation was moderately disadvantageous; it resulted in a lower aggregated score on the grammatical judgment test. At the fourth year of study students were not served well by rules that are so creative that they often cannot be judged as either preterite or imperfect rules. Unlike student-

generated rules (which were neither helpful nor unhelpful at this level), idiosyncratic rules may be a sign of a lack of real understanding of the preterite and imperfect and the principles and rules that attempt to explain their use. Students who cannot make sense of the preterite and the imperfect and find unhelpful the explanations that have been given them may resort to creating their own formulations with little basis in linguistics in an attempt to sort out the differences between the two aspects.

By the fifth year, the articulation of principles in general became at least a slight predictor of overall success in making correct verb aspect choices. Students who had come to understand principles were now in a position to use this knowledge to make more accurate preterite and imperfect verb choices. By the fifth year of study, students may have had enough exposure to and practice with principles that they knew how to apply them effectively. Those fifth-year students who did not possess this knowledge of the correct application of principles, who were not making the linkage between principles and verb choice, did not perform as well on a grammatical judgment test. This finding indicates that the teaching of principles is advantageous, even if there appears to be a quite long incubation period before this knowledge is actually useful to students.

Question 3: What are the relations between different types of instructed explicit knowledge about the preterite and the imperfect and accuracy, frequency and variability in the production of the preterite and imperfect at different levels of study?

The most interesting finding in relation to research question 3 is that, once again, explicit knowledge of teacher and textbook rules was proved highly applicable to students. It was generally the best predictor relative to the other types of aspect knowledge (1) of accuracy in

verb aspect production in writing, (2) of frequency of aspectual verb production in writing, and (3) of variability in preterite and imperfect verb production in writing.

Examining each year of study separately revealed that explicit knowledge of teacher and textbook rules sometimes played a role different from the impact it had on the grammatical judgment test. For students at the fourth year of study, for example, teacher and textbook rules were highly related to grammatical judgment test scores, but that explicit knowledge was unrelated to actual plausible production of aspectual verbs in their writing. For third- and fifth-year students, on the other hand, explicit knowledge of teacher and textbook rules for verb aspect was significantly related to plausible verb production. In addition, teacher and textbook knowledge played a different role when students were writing in class and out of class, especially in relation to frequency and variability of production.

Plausible Production

Plausible Written Production and Articulated Knowledge of Principles and Rules Across Years of Study

Table 36 summarizes in schematic view the relations between types of explicit knowledge and appropriate utilization of verb aspect in writing. It breaks down the findings to enable comparisons between in-class and out-of-class writing.

Table 36

Summary of Multiple Regression of Plausible Aspect Usage by Writing Task Against Types of Aspect Knowledge in Grammatical Judgment Rationales

	Plausible aggregated in class	Plausible aggregated out class	Plausible preterite in class	Plausible preterite out class	Plausible imperfect in class	Plausible imperfect out class
Overall	Sig	NS	NS	NS	NS	Sig
prediction						
Variance	14 %					7 %
explained						
Beta weights	Prin .055					T/T .319
for	T/T .344					
components	SR .035					

As shown in Table 36, student articulation of principles, teacher and textbook rules and student-generated rules combined collectively to predict use of the preterite and the imperfect in their writing, although the amount of variance accounted for was not great. Among these three types of explicit knowledge, teacher and textbook rules was by far most clearly associated with the grammatical judgment battery. Furthermore, teacher and textbook rules was the only significant predictor, albeit a slight one, of plausible out-of-class imperfect production. Thus, again we see that student articulation of teacher and textbook rules was the best predictor of success. However, with writing tasks, especially the out-of-class task, the predictive value of

student articulation of teacher and textbook rules is not as far-reaching as it was for conventional usage on the judgment test, as it predicted only two of the writing task plausible measures.

Plausible Written Production and Articulated Knowledge of Principles and Rules by Year of Study and Across All Years

Table 37 summarizes correlations by year of study between plausible written production by writing task and the articulation of principles and rules.

Table 37

Summary of Correlations by Year of Study and Across All Years between Plausible Aspect Production by Writing Task and Types of Aspect Knowledge in Grammatical Judgment Rationales

	Plausible Total		Plausible preterite		Plausible imperfect	
	Aspect					
	IN	OUT	IN	OUT	IN	OUT
Year 3	T/T-L					
Year 4				Pret T/T-M	Imp SR/M	
Year 5	T/T-L					
All Years	T/T-L				Imp T/T-L	Imp T/T-L

In-class writing. Third-year students who knew more teacher and textbook rules used the preterite and imperfect more accurately in their in-class writing. For these students, knowing teacher and textbook rules gave them a distinct advantage in their preterite and imperfect usage.

On the other hand, the advantage of knowing teacher and textbook rules did not apply to fourth-year students.

These findings are surprising given that they contradict the findings for the judgment test: fourth-year students' overall performance on the judgment test was predicted quite strongly by their knowledge of teacher and textbook rules, while third- and fifth-year students' performance was not. While it is very difficult to reconcile the findings concerning the usefulness of teacher and textbook rules for different groups for in-class writing with the findings regarding the usefulness of teacher and textbook rules on the judgment test at different years of study, the writing task findings have to be considered of greater importance because they involve knowledge in production. The judgment test, on the other hand, measures knowledge apart from production. The ultimate goal of most language classes is that students be able to use their knowledge in some sort of meaningful production, be it oral or written.

Out-of-class writing. A knowledge of teacher and textbook rules did not show as pronounced an effect on out-of-class writing as it did on in-class writing. In fact, only preterite teacher and textbook rules aided fourth-year students in their use of the preterite, and only imperfect teacher and teacher rules were of benefit with the imperfect across all years of study. It must be pointed out, however, that knowledge related to teacher and textbook rules was the only kind that was of benefit to students in preterite and imperfect usage in writing; no other type of knowledge—aspectual principles, students rules—gave them any sort of edge in their out-of-class writing.

A knowledge of teacher and textbook rules, therefore, had a more limited impact on students' accurate preterite and imperfect production out of class than in class. This finding is surprising because one would expect explicit knowledge to be less efficacious in a more

pressured, time-bound setting, which theoretically requires a use of implicit knowledge, and to be more efficacious in a less-pressured environment in which students had more time to think about their verb aspect choice, as was the case for out-of-class writing. While it has generally been claimed that timed grammatical judgment tests are reliable indicators of the use of implicit knowledge and untimed grammatical judgment tests of explicit knowledge (Bialystok, 1981; Ellis, 1991; Han and Ellis, 1998), this study suggests that production tasks designed to constrain or to free up time in composing do not always distinguish between these two types of knowledge. Certainly one possible explanation is that, despite knowing they would receive grades on their homework, students nonetheless dashed off the homework essays as rapidly as possible.

These written production findings when considered together suggest that at all years of study, but especially at the third and fifth years, students with more teacher and textbook knowledge produce the preterite and imperfect with greater accuracy. Those with knowledge of teacher and textbook rules are making better verb aspect choices in their writing. This finding is particularly true for in-class writing, but it applies somewhat to out-of-class writing as well.

Attempted Production

Attempted Written Production and Articulated Knowledge of Principles and Rules Across All Years of Study

Table 38 summarizes multiple regressions of aggregated and disaggregated attempted preterite and imperfect written production by writing task against articulation of principles and rules.

Table 38

Summary of Multiple Regression of Attempted Aspect Production by Writing Task Against

Types of Aspect Knowledge in Grammatical Judgment Rationales

	Attempted aggregated		Attempted preterite		Attempted imperfect	
	IN	OUT	IN	OUT	IN	OUT
Overall prediction	Sig	NS	NS	NS	NS	NS
Variance explained	8.3 %					
Beta weights for components	T/T .266					

Consistent with other predictors of written production in this study, teacher and textbook rules are of predictive value for attempted preterite and imperfect production and variability. In fact, they are the only significant predicative component for the two attempted production indices with an overall significant prediction equation: attempted in-class aggregated preterite and imperfect and attempted in-class variability. What stands out by its absence is the lack of predictive value for teacher and textbook rules, or any aspect knowledge type for that matter, in regard to attempted out-of-class production and variability. As was true with plausible production, teacher and textbook rules' predicative power is more limited than it was with regard to conventional usage on the judgment test.

Attempted Written Production and Articulated Knowledge of Principles and Rules By Year of Study and Across All Years

In-class writing. Correlations at each year of study echo the findings of the multiple regressions: teacher and textbook rules are the best indicator over all for attempted in-class production. Yet at no year of study did students with a greater knowledge of teacher and textbook attempt to use more preterite or imperfect in their in-class writing. In fact, only third-year students with a knowledge of preterite principles attempted greater preterite production. This finding indicates that if students at lower years of study are taught and come to understand preterite principles, they are more likely to produce more preterite verbs. That at a lower year of study a knowledge of aspectual principles was of benefit to students suggests that teaching aspectual principles from the beginning of the study aspect is advantageous. Even if that knowledge may not fully take root until years later, it will be useful if it does nothing more than give students greater confidence to try to produce more preterite verb forms.

Out-of-class writing. As was true of the multiple regressions, none of the by-year correlations between out-of-class attempted production and knowledge type showed any statistical significance. Why knowledge type would have no association with out-of-class attempted production but a relation with its in-class counterparts is not easily explained. One would expect the association between greater knowledge and attempted production to be as great if not greater out of class than in class, given that students had more time to write out of class. As explained earlier, no type of knowledge may be manifest in student out-of-class writing because they have so many resources to draw from at home.

Variability in Aspectual Verb Production

Variability in Written Production and Articulated Knowledge of Principles and Rules by Year of Study and Across All Years

The variability score indicated the balance in student use of the preterite and the imperfect in their writing, that is, the degree of students' willingness to venture forth out of the comfort zone of the preterite and use the imperfect as well. The average across the years of study cell mean for attempted preterite and attempted imperfect production (.5525 for preterite and .2359 for the imperfect) indicated that students attempted to use the preterite twice as often as they did the imperfect. My impression as a classroom teacher has been that students prefer to use the preterite instead of the imperfect because they think the preterite corresponds more to the English simple past. Yet to give a more complete narration of an event, replete with background and description, students need to use the imperfect as well. Variability becomes, therefore, an important measure of the completeness of student production. To verify findings in this study of preference for preterite over imperfect, other Spanish learner language corpora should be examined.

In the multiple regression analysis of the variability index student articulation of teacher and textbook rules was, again, a weak predictor, and the only predictor, of greater student variability in the production of the preterite and the imperfect in-class; it did not predict student variability in out-of-class production. Correlations by year of study and across all years of study between students' variability scores and types of knowledge showed that fourth-year students who articulated more teacher and textbook rules showed more completeness in their writing in class than their classmates who did not. This finding was also true across all years of study. Students who know more teacher and textbook rules are more willing to take a risk and use not

only the preterite but the imperfect as well and in that way are more complete writers in the past tense in Spanish.

Pedagogical Implications

The findings of this study show that students prefer ways of thinking about the preterite and imperfect that are that are concrete and easy to apply, primarily teacher and textbook rules. The question then becomes, is this type of knowledge advantageous to students? The short answer is yes, that it facilitates student competence and production in relation to aspect, especially at earlier years of study. Yet, given that by the fifth year of study, a knowledge of aspectual principles facilitates students competence and a lack of knowledge of these principles among fifth-year students is dysfunctional. Given that half-truths by definition do not always work, it makes sense to teach aspectual principles as well—particularly to more advanced students. Both teacher and textbook rules and aspectual principles should be taught.

And yet a knowledge of these two different types of explanations is not the ultimate objective. At decision point 20 (*And I rode every day for the next 30 years of my life and often competed in races*) only 45 students of 154 chose the preterite, the correct (i.e., conventionally chosen by native Spanish speakers) verb aspect. Some students chose the imperfect because of the teacher and textbook rule *key word everyday* (category 27), while others chose the imperfect, citing aspectual principle *habitual past action*. Still others chose the imperfect, attributing their choice to the imperfect teacher/textbook rule *repeated action*. The reason, however, they did not choose the preterite and give as the preferred aspectual principle *the completion of action* was not that they did not know this principle, for they had already invoked it at many other decision points. They did not invoke this principle in this instance because they did not know how to place in the background the repeatedness of the action and instead bring to the foreground the

overriding completion of the action. Thus, the issue was *not* so much one of knowing principles as knowing how to take the entire context of the sentence and the larger work into consideration, being able to place in the background and the foreground information while working with time expressions. Until students are able to focus on the larger context and to place information in its proper primary or secondary plane as various researchers have suggested (García and v. Putte, 1988; Ruiz, 1988; Westfall and Forester, 1996) even their sophisticated knowledge of aspectual principles will not serve them well.

Regardless of the type of explanations teacher and textbooks impart to students, students will still invent at least some rules they have never been taught or seen in a textbook. These student-generated rules include formulations such as *Spanish equivalent of English simple past* (category 32). There is reason to believe, therefore, that regardless of the kind of rules or principles we provide students through instruction, they are often going to take the less mentally-taxing way out by constructing their own concrete prescriptions. This phenomenon is not unexpected, since learners have always engaged in this type of construction of knowledge. It is also not to be discouraged, given that it is how students find their way through the maze of information imparted to them and find a understanding, while limited in stages, of the topic at hand (Brooks and Donato, 1994).

This study also shows that when sources of knowledge not related to aspect are eliminated through the use of technology and a story matrix in English, students perform well on a test of their preterite and imperfect knowledge. The mean for scores on the grammatical judgment test ranged from 15.203 to 15.636. These means (based on a maximum score of 19) demonstrate that when students are tested in a maximally scaffolded situation, they are able to demonstrate their knowledge of the aspect. If teachers want to gain a better understanding of

students' knowledge of aspect, they may want to test them with the kind of maximum support present in the study. This type of testing may give teachers who feel that their students do not understand perfective and imperfective aspect a different perspective on their students' knowledge.

Limitations of the Study

One limitation of the study concerns the design of the grammatical judgment test. While it seems ironic that a knowledge of rules---which are case specific and half-truths---as opposed to the more sophisticated principles, could correlate significantly with judgment test scores and plausible preterite and imperfect production, the design of the grammatical judgment test may have allowed for such a phenomenon. At many decision points the application of a half-truth would have led to the correct aspect choice. At the very first decision point, for example, "*When I was visiting*," an aspect choice based on the imperfect teacher and textbook rule *was or were + _____ ing* (category 28) would have resulted in the correct aspect choice of imperfect. At decision point 3, "*It was great*," students could have applied imperfect teacher/textbook rule *description of people, places and things* and made the right aspect choice.

Even at the decision points designed to penalize the use of a half-truth, there was often another rule representing another half-truth that would apply in the same context. For example, at decision point 8, in which a distinct amount of time is expressed (*at least two hours*), the invoking of preterite rule *actions with a specific duration* might have led students to choose the preterite and make a wrong aspect choice. If students had focused instead on the phrase also appearing in that sentence, "*When I was a child*," a phrase that they have seen many times in imperfect contexts in class and texts, they would have chosen the imperfect and possibly invoked imperfect rule 27 *key words such as de nino*. Thus, while one half-truth would have led them to

the wrong aspect choice, the preterite, another would have led them to the correct aspect choice, the imperfect. Of 12 of the 19 decision points (1, 3, 4, 6, 7, 8, 9, 11, 14, 15, 16 and 19), students could have made the right aspect choice applying a half-truth, and apparently they often did.

Another limitation of the study is the make-up of the sample: students at a private school that has exclusive admissions. While these students were not in honors classes, bringing the sample more in line with an average secondary school population, they do not fully represent a cross-section of such a population. This limits the generalizability of the study to other secondary school contexts. The nature of the sample may also explain the aberrant finding that fourth-year students used more principles and rules than third-year students but that fifth-year students did not.

A third limitation is the ceiling effect represented by the high grammatical judgment test scores at each year of study. A more rigorous test might have resulted in a greater diversity of scores between the years of study, which would have shown any group differences.

Suggestions for Future Research

Further experimental research that examines the effect over time of teaching only principles or only rules would go a long way in answering the question of whether the kind of explicit knowledge we teach determines how students view the perfective and imperfect aspect and the efficacy of that knowledge. Ristvey (1995) found that students who were taught only aspectual principles performed better on a competence test than those who were taught only prescriptive rules. The same sort of experimental study which granted students longer exposure to those types of knowledge included statistical tests and tracked the long term effects would provide valuable information toward answering those questions.

Future research also needs to attempt to explain the lack of developmental difference between the groups. One would have expected greater group differences in student competence, plausible and attempted production, and possibly in the explicit contents of their knowledge as students progressed. That is, one would have expected that with each additional year of study a significant difference would have been detected in relation to these measures. Why this difference was generally not detected in regard to these measures needs to be investigated.

Likewise, the question of the presence of intragroup differences needs to be examined. Why was it that some students at a given year of study benefited more from a certain type of explicit knowledge, while others of their classmates did not? For example, fifth year students who invoked more aspectual principles performed better on the judgment test, but there was considerable variation among those students. Individual differences in the efficacy of different types of knowledge within a year of study also merit examination.

While we now know more about student explicit knowledge of perfective and imperfective aspect, a greater understanding concerning student *implicit* knowledge and the exact role, if any, explicit knowledge plays in the development of this implicit knowledge is also warranted. Implicit knowledge allows us to use a language without constant recourse to analysis; its development, therefore, is essential for native-like fluency and a goal of many language programs. Some have posited a role for explicit knowledge in the development of implicit knowledge (Gass 1983; Sorace, 1985; R. Ellis, 1993; Sharwood-Smith, 1981), while others have not (Krashen, 1981), but the jury remains out on this question. The greater our knowledge of the role explicit knowledge, and in particular, different kinds of explicit knowledge play in the development of implicit knowledge, the more informed decisions

educators can make about what type of direct instruction of perfective and imperfective and other grammatical concepts to impart.

NOTES

1- These proportions were the ratio of the number of decision points at which at least one rationale was given to the number of times a variable was invoked at each decision point. For example, if a student invoked at least one rationale at 18 of the 19 decision points and the rationales at 9 of the decision points were contextually-appropriate aspectual principles (i.e., preterite aspectual principles invoked at preterite decision points and imperfect aspectual principles invoked at imperfect decision points), the student would receive an aspectual principle composite score of .50.

2- There were only nine decision points at which the preterite could have been used and 14 at which the imperfect could have been used. To determine if each decision point where students failed to give a rationale was a preterite or imperfect decision point, to calculate by hand a percentage of the total number of preterite and imperfect decision points that number represented, and then to calculate by hand, using that percentage score, a proportional score for the six different preterite and imperfect variables would have been too time consuming.

3- The proportional composite score for each variable was the ratio of said variable to the total number of verbs used in a writing task. For example, the proportional composite score for in-class plausible preterite usage was calculated as the ratio of number of verb used plausibly in the preterite in class to the total number of verbs a student used in class.

4- A ranking of the total use of each category at aspect-appropriate decision points was not computed because each principle and rule was not represented equally in the verb judgment test, that is, students did not have, for example, the same number of opportunities to use the principle

the beginning of action (category 2) as they did to use the principle *the completion of action* (category 1) because of the content of the story. This inequity could have been overcome if the total use score could have been expressed as a proportion: the ratio of total use of a principle, rule or other category to number of decision points at which it could have been correctly invoked. Yet varying interpretations of what constituted a correct context for each category made the calculation of this proportion impossible.

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APPENDIX A

Spanish Verb Aspect Grammaticality Judgment Test/Confidence Ratings/Rationale Task

Today you will complete the following three tasks:

- 1) read a story and select the correct preterite and imperfect verb forms
- 2) rate your confidence in the accuracy of your choices
- 3) record the reasoning behind your choices

Task 1

The first task you will complete today is designed to see how well you use the preterite and the imperfect. To begin this task, read the following story.

The Big Decision

One weekend when I was visiting San Antonio, I went to see a motor cross race. It was great! I was so excited for the next few hours until I thought of the boring, dead-end job that I was going to have to return to on Monday. Every time I would try to put the race out of mind, I would begin to think about it again, to relive the excitement, the thrill. Then I started to think about my life.

Earlier in my life, I rode my bike for at least two hours every day. In 1960, even though I was only twelve, I already competed in races. Why did I given up racing? When someone asked me that at the race, I said “I was planning on pursuing it but I couldn’t; I had to take care of the family business.” And then I thought of my friend and said to myself: “He used to be a lawyer; now he’s a doctor, something he’d always wanted to be. Surely it’s not too late for me to make a change, either.”

That Monday I called the race organizers 10 times. All that day I wanted to talk to them but I never reached them. The next day, however, as soon as they answered, I had my answer: I was going back to racing. And I rode every day for the next 30 years of my life and competed in many races.

Further instructions for Task 1

In a few minutes you will see, on the computer, the same story in English but this time 20 verbs or verb phrases have been numbered from 1-20 in superscript. For each of these twenty verbs or verb phrases, you must decide if, in Spanish, the preterite or the imperfect would be the correct corresponding verb form. Indicate your choice of preterite or imperfect for each verb or verb phrase by selecting the preterite or imperfect form at the pull down whose number matches that of the verb or verb phrase.

Take a moment now and practice with the sample sentence below. Read the sentence, decide if the preterite or the imperfect would be the correct corresponding verb form, and then choose either **fue** o **iba** from the corresponding drop down menu.

Yesterday George went ¹ to buy bread.

You can go back and change your answers as many times as you would like. Your answer at each decision point will appear in the pull down window. There is no time limit so take your time and think carefully about your choices. Please do your best.

Raise your hand if you have any questions.

When you are ready, click the start button to begin.



The Big Decision

One weekend when I was visiting ¹ San Antonio, I went ² to see a motor cross race. It was ³ great! I was ⁴ so excited for the next few hours until I thought ⁵ of the boring, dead-end job that I was going to have to return to on Monday. Every time I would try ⁶ to put the race out of mind, I would begin ⁷ to think about it again, to relive the excitement, the thrill. Then I started to think about my life.

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That Monday I called ¹⁵ the race organizers 10 times. All that day I wanted ¹⁶ to talk to them but I never reached them. The next day, however, as soon as they answered ¹⁷, I had ¹⁸ my answer: I was going ¹⁹ back to racing. And I rode ²⁰ every day for the next 30 years of my life and competed in many races.

# 1	# 2	# 3	# 4	# 5
# 6	# 7	# 8	# 9	# 10
# 11	# 12	# 13	# 14	# 15
# 16	# 17	# 18	# 19	# 20

Task 2 [Click here for instructions.](#)

Task 2

The second task is designed to measure your confidence in your preterite and imperfect answers in the paragraph. You will rate, on the computer, how confident you are that your preterite and imperfect choices would be acceptable to a native Spanish speaker. Use the 1 to 10 scale below to rate your answers. The descriptors (“not at all confident,” etc.) are just there to guide you. You can answer with any number from the scale.

1	2	3	4	5	6	7	8	9	10
not									
at all				moderately				completely	
				confident				confident	
confident									

For example, if you feel “*completely confident*” that **visité** or **visitaba**, whichever you chose for the first decision point, would be acceptable to a native Spanish speaker, you would choose “**10**” from the pull down menu for *Number 1*. If you feel somewhere between “*not at all confident*” and “*moderately confident*” for **fui** or **iba** at the second decision point, you would click on “**2**”, “**3**” or “**4**” for *Number 2*. Note: You will have to scroll between your choices.

Raise your hand if you have any questions.

Close this window to return to your exercise. You may click on the instructions page as many times as you need to.

1	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>
6	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>
11	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>
16	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="5"/>

Task 3 [Click here for instructions.](#)

Task 3

The third task you will complete is designed to find out how you think about the preterite and the imperfect. As you look back over the paragraph, you are going to record the reason you chose the preterite and imperfect for each verb or verb phrase. State into the microphone why you think the preterite or the imperfect was the right choice for each verb or verb phrase. There is no certain desired length for your answers. Just honestly state why you think the preterite or the imperfect was the right choice.

For example, you might say: “**Number one visité (or visitaba) because... Number two fui (or iba) because... etc..**

You will use a six minute blank in the DAVID program. Take your time and remember that there is no certain desired length for your answers. You can stop the recording to think about your responses - just remember to restart it when you resume speaking. Please do your best. When you begin, be sure to click the red round button on DAVID to start recording. You may stop the recording at any time to think about a response (just be sure to restart it).

Raise your hand if you have any questions.

Saving the file when finished:

- 1) Click on Menu - File - Save File, change to the G drive, click on the SaveHere folder, then Spanish, then Tucker, then in the folder for your level (Level 3, Level 4, or Level 5).
- 2) Name the file the last four digits of your social security number and your teachers last name and the class period (example: 3340 Tucker 4).
- 3) Press “save”.

Close this window to return to your exercise. You may click on the instructions page as many times as you need to.

FINAL STEP

Before you submit your responses, please type in the information requested below.

Last 4 digits of your social security number

Teacher's Name

Class period

Level of Spanish

Gender

WHEN YOU HAVE COMPLETED EVERYTHING, CLICK THE FINISH BUTTON BELOW.

APPENDIX B

Spanish Verb Aspect Grammaticality Judgment Test General Instructions

Today you will complete the following three tasks:

- 1) read a story and select the correct preterite and imperfect verb forms
- 2) rate your confidence in the accuracy of your choices
- 3) record the reasoning behind your choices

APPENDIX C

Frantzen' s Aspectual Principles

The imperfect is used for

- a) actions and states in progress at some focused point in the past
- b) habitual past actions,
- c) repetitious past actions
- d) anticipated/planned past actions

The preterite is used to focus on

- a) the completion of past actions or states
- b) the beginning of past actions or states (1995, p. 147)

APPENDIX D

Spanish Verb Aspect Grammaticality Judgment Test Instructions

Task 1

The first task you will complete today is designed to see how well you use the preterite and the imperfect. To begin this task, read the following story.

The Big Decision

One weekend when I was visiting San Antonio, I went to see a motor cross race. It was great! I was so excited for the next few hours until I thought of the boring, dead-end job that I was going to have to return to on Monday. Every time I would try to put the race out of mind, I would begin to think about it again, to relive the excitement, the thrill. Then I started to think about my life.

Earlier in my life, I rode my bike for at least two hours every day. In 1960, even though I was only twelve, I already competed in races. Why did I given up racing? When someone asked me that at the race, I said “I was planning on pursuing it but I couldn’t; I had to take care of the family business.” And then I thought of my friend and said to myself: ‘He used to be a lawyer; now he’s a doctor, something he’d always wanted to be. Surely it’s not too late for me to make a change, either.’

That Monday I called the race organizers 10 times. All that day I wanted to talk to them but I never reached them. The next day, however, as soon as they answered, I had my answer: I was going back to racing. And I rode every day for the next 30 years of my life and competed in many races.

Further instructions for Task 1

In a few minutes you will see, on the computer, the same story in English but this time 20 verbs or verb phrases have been numbered from 1-20 in superscript. For each of these twenty verbs or

verb phrases, you must decide if, in Spanish, the preterite or the imperfect would be the correct corresponding verb form. Indicate your choice of preterite or imperfect for each verb or verb phrase by selecting the preterite or imperfect form at the pull down whose number matches that of the verb or verb phrase.

Take a moment now and practice with the sample sentence below. Read the sentence, decide if the preterite or the imperfect would be the correct corresponding verb form, and then choose either **fue** o **iba** from the corresponding drop down menu.

Yesterday George went ¹ to buy bread.

You can go back and change your answers as many times as you would like. Your answer at each decision point will appear in the pull down window. There is no time limit so take your time and think carefully about your choices. Please do your best.

Raise your hand if you have any questions.

When you are ready, click the start button to begin.

START

APPENDIX E

Spanish Verb Aspect Grammaticality Judgment Test

The Big Decision

One weekend when I was visiting ¹ San Antonio, I went ² to see a motor cross race. It was ³ great! I was ⁴ so excited for the next few hours until I thought ⁵ of the boring, dead-end job that I was going to have to return to on Monday. Every time I would try ⁶ to put the race out of mind, I would begin ⁷ to think about it again, to relive the excitement, the thrill. Then I started to think about my life.

Earlier in my life, I rode ⁸ my bike for at least two hours every day. In 1960, even though I was ⁹ only twelve, I already competed ¹⁰ in races. Why did I given up racing? When someone asked me that at the race, I said “I was planning ¹¹ to pursue it but I couldn’t ¹²; I had ¹³ to take care of the family business.” And then I thought of my friend and said to myself: “He used to be ¹⁴ a lawyer; now he’s a doctor, something he’d always wanted to be. Surely it’s not too late for me to make a change, either.”

That Monday I called ¹⁵ the race organizers 10 times. All that day I wanted ¹⁶ to talk to them but I never reached them. The next day, however, as soon as they answered ¹⁷, I had ¹⁸ my answer: I was going ¹⁹ back to racing. And I rode ²⁰ every day for the next 30 years of my life and competed in many races.

# 1	# 2	# 3	# 4	# 5
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# 6	# 7	# 8	# 9	# 10
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# 11	# 12	# 13	# 14	# 15
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# 16	# 17	# 18	# 19	# 20
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APPENDIX F

Spanish Verb Aspect Grammaticality Judgment Test Confidence Ratings

Task 2 [Click here for instructions.](#)

Task 2

The second task is designed to measure your confidence in your preterite and imperfect answers in the paragraph. You will rate, on the computer, how confident you are that your preterite and imperfect choices would be acceptable to a native Spanish speaker. Use the 1 to 10 scale below to rate your answers. The descriptors (“not at all confident,” etc.) are just there to guide you. You can answer with any number from the scale.

1	2	3	4	5	6	7	8	9	10
not									
					moderately				completely
at all									
					confident				confident
confident									

For example, if you feel “*completely confident*” that **visité** or **visitaba**, whichever you chose for the first decision point, would be acceptable to a native Spanish speaker, you would choose “**10**” from the pull down menu for *Number 1*. If you feel somewhere between “*not at all confident*” and “*moderately confident*” for **fui** or **iba** at the second decision point, you would click on “**2**”, “**3**” or “**4**” for *Number 2*. Note: You will have to scroll between your choices.

Raise your hand if you have any questions.

Close this window to return to your exercise. You may click on the instructions page as many times as you need to.

1	<input type="text" value="5"/>	2	<input type="text" value="5"/>	3	<input type="text" value="5"/>	4	<input type="text" value="5"/>	5	<input type="text" value="5"/>
6	<input type="text" value="5"/>	7	<input type="text" value="5"/>	8	<input type="text" value="5"/>	9	<input type="text" value="5"/>	10	<input type="text" value="5"/>
11	<input type="text" value="5"/>	12	<input type="text" value="5"/>	13	<input type="text" value="5"/>	14	<input type="text" value="5"/>	15	<input type="text" value="5"/>
16	<input type="text" value="5"/>	17	<input type="text" value="5"/>	18	<input type="text" value="5"/>	19	<input type="text" value="5"/>	20	<input type="text" value="5"/>

APPENDIX G

Spanish Verb Aspect Grammatical Judgment Test Rationale Task

Task 3 [Click here for instructions.](#)

Task 3

The third task you will complete is designed to find out how you think about the preterite and the imperfect. As you look back over the paragraph, you are going to record the reason you chose the preterite and imperfect for each verb or verb phrase. State into the microphone why you think the preterite or the imperfect was the right choice for each verb or verb phrase. There is no certain desired length for your answers. Just honestly state why you think the preterite or the imperfect was the right choice.

For example, you might say: “**Number one visité (or visitaba) because... Number two fui (or iba) because...** etc..

You will use a six minute blank in the DAVID program. Take your time and remember that there is no certain desired length for your answers. You can stop the recording to think about your responses - just remember to restart it when you resume speaking. Please do your best. When you begin, be sure to click the red round button on DAVID to start recording. You may stop the recording at any time to think about a response (just be sure to restart it).

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- 3) Press “save”.

Close this window to return to your exercise. You may click on the instructions page as many times as you need to.

APPENDIX H

Writing Task Instructions

In-Class Writing Task

For the final phase of the study, you will complete two more tasks, one in class and one for homework. Today in class you will write about an episode of one of your favorite TV shows or about a movie you like. Describe what went on in the episode or movie. Use the past tense in Spanish. Make sure you describe the beginning, middle and end of the episode or movie. Also include background information. You will have only fifteen minutes to complete this task so focus primarily on content, on the story itself, as you write. You may use a dictionary or ask your teacher for vocabulary. This exercise will count as a daily grade. Write in the space provided below. Before you begin to write, fill out the background information requested below. When you finish, write your name on the back of this sheet so your teacher will be able to identify your work.

Last four digits of your social security number: _____ Level of Spanish _____

Spanish teacher' s last name: _____ Class period: _____ Gender: _____

Out-of-Class Writing Task

Tonight for homework you will write about an episode of one of your favorite TV shows or a movie you like. Make sure you write about a different episode or movie from the one you wrote about in class today. Describe what went on in the episode or movie. Use the past tense in Spanish. Make sure you include the beginning, middle and end of the episode or movie. Also include background information. Your description should be at least a page in length. As you write pay attention to both content and form; your teacher will assess your writing for grammatical correctness as well as your ability to express yourself in Spanish. Give lots of details. You may use a dictionary. You will get a homework grade for your description. Begin your description below and continue it on the back of this sheet. Before you begin, fill out the background information requested below. When you finish, write your name on the back of this sheet so your teacher will be able to identify your work.

Last four digits of your social security number: _____ Level of Spanish _____

Spanish teacher' s last name: _____ Class period: _____ Gender: _____