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EXPLICIT VS. IMPLICIT L2 GRAMMAR KNOWLEDGE IN WRITTEN ERROR CORRECTION

Abstract

Error correction is undoubtedly an important part of the process of drafting and producing written texts. The aim of the paper is to analyse the learners' ability to correct grammatical errors in relation to the type of knowledge they employ in this task. Green and Hecht (1992), in an often quoted study, found a low correlation between L2 learners' knowledge of explicit grammar rules and their ability to correct errors. They interpret this as suggesting that in error correction, learners rely primarily on their implicit knowledge. However, certain design features of their study might have caused the subjects to simply guess the correct forms, which, in turn, as DeKeyser (2003) suggests, may have led to the overestimation of implicit knowledge. This paper reports the results of an experiment where 150 Polish learners of English were administered a corpus-based error correction task, the design of which, however, differed from that of Green and Hecht (1992). These alterations resulted in finding a much closer link between the subjects' knowledge of rules and their ability to correct grammatical errors.

1. Explicit knowledge and second language acquisition

As R. Ellis (2005) points out, linguistic knowledge, whether represented by innatist or classical connectionist models, is conceived of as implicit. Acquiring such implicit knowledge is the end point of first language (L1) development, and it is also considered to be the ultimate goal of second language (L2) acquisition. For this reason, the role of explicit knowledge in L2 acquisition is normally discussed in relation to implicit knowledge.

A number of positions on the relationship between implicit and explicit knowledge can be distinguished. First, according to Krashen (e.g. 1982, 1985) explicit knowledge plays no role in second language acquisition: there is no interface between explicit and implicit knowledge and the former can in no way contribute to the development of the latter. In the words of Krashen (1985: 42-

3): "learned competence does not become acquired competence". Language use is also said by Krashen to be based on the acquired system: explicit knowledge can only be used to monitor utterances initiated by that system, provided certain conditions are met.

Second, there are those who claim that while explicit and implicit knowledge are distinct, the former can contribute to the development of the latter. For example, Hulstijn (2002: 208-209) says that practice of explicit rules can provide learners with opportunities for implicit learning: "what may appear to be automatization of explicit, declarative knowledge (...) is, in fact, the building of a neural network of distributed types separately from and in addition to, the existing explicit, declarative, exclusively symbolic knowledge base, probably located in different brain areas." N. Ellis (2005, 2007) sees three component processes of the interface between explicit and implicit knowledge: noticing formal L2 features, noticing the gap between one's erroneous utterances and their corrective reformulations, and guided output practice (cf. Sharwood Smith, 1981; Schmidt and Frota 1986; Schmidt 1990, 2001).

The third position allows for the conversion of explicit into implicit knowledge, provided conditions on learnability are met. R. Ellis (1997: 115) proposes that explicit non-developmental rules can become implicit through formal instruction. Further, in the case of explicit developmental rules, learners can convert them into implicit knowledge if they are developmentally ready to do so, i.e. if they have reached "the stage of acquisition that allows for integration of the new rule into the interlanguage system."

The final view assumes the strongest interaction between the two types of knowledge. It is claimed that explicit rules can in general be proceduralized through practice and used in spontaneous L2 production (e.g. Johnson, 1996; DeKeyser, 1997, 1998, 2003, 2007). For DeKeyser (2003: 329) fully automated procedural knowledge is "functionally equivalent to implicitly acquired knowledge", and if the original explicit representation is lost, explicit knowledge can become implicit "in the narrow sense of knowledge without awareness".

2. Explicit knowledge and second language use

Before we focus on Green and Hecht (1992), three general observations need to be made concerning past research into the relationship between explicit knowledge and second language use. First, the evidence for a correlation between explicit L2 knowledge and L2 proficiency is mixed. The findings of Hulstijn and Hulstijn (1984) indicate that L2 learners can perform certain speaking tasks better if they have the relevant explicit rules. Sorace (1985) found

growing interaction between her subjects' metalinguistic knowledge and L2 productive use. However, more recently, Alderson et al. (1997), in a large-scale study, established only a weak relationship between L2 metalinguistic knowledge and linguistic proficiency. The conclusion that Alderson et al. (1997) reach is that their study indicates that teaching metalinguistic knowledge with a view to improving learners' proficiency is not justified. Yet, there is also recent empirical evidence that explicit teaching of grammar rules can lead to considerable improvements in unplanned language use, for example, Housen et al (2005) and Sheen (2005) (for a meta-analysis of earlier research into the effectiveness of explicit and implicit instruction see Norris and Ortega, 2000).

The second observation we would like to make is that, as for instance Macrory and Stone (2000), Hu (2002) and R. Ellis (2005) have demonstrated, there is a gap between explicit knowledge and spontaneous language use: when learners are placed under time constraints, as in spontaneous speech or in fast-writing tests, they are unable to make use of many of the rules they can access when they are given more time. According to R. Ellis (2005), this reflects the fact that in time-pressured tests learners can only rely on their implicit knowledge, whereas in unpressured ones, both implicit and explicit knowledge can be called upon. Based on the results of a Principal Component Factor Analysis, R. Ellis (2005, 2006, 2008) in fact identifies time-pressured tests, like oral narrative and timed grammaticality judgement, as measures of implicit knowledge, and untimed grammaticality/rule judgement tests as measures of explicit knowledge.

Third, there is research which indicates that even when learners do not operate under time constraints, they often seem to appeal to implicit knowledge in various linguistic judgements they make. For example, Bialystok's (1979) subjects made comparable grammaticality judgements, regardless of the time pressure that was applied. For Green and Hecht's (1992) learners, having no explicit rule was not an indication of poor performance on an error correction task.

2.1. Green and Hecht (1992)

Green and Hecht (1992) is a large-scale study which examines, inter alia, the extent to which explicit knowledge is relied on by L2 learners of English in making error corrections. The subjects were 300 German learners at various levels of L2 advancement. They were administered a test consisting of twelve sentences with underlined errors commonly made by German learners in communicative tasks in English. Their task was to correct the underlined

portions and, if possible, to write down the relevant rules. The following are three examples from the test that was administered (183-4):

1. *There is a farm near us. Do you like to ride horses?*
2. *Of course, we won't have to pay something for the ride.*
3. *He drives more careful than before.*

The central finding of the study is a low correlation between explicit rules and appropriate corrections: overall, the subjects were able to provide 78 per cent of the right corrections, but only 46 per cent of the rules. Also, in as many as 43 per cent of the cases, appropriate corrections were associated with incorrect rules.

The way in which Green and Hecht (1992: 178) interpret this finding is that their subjects "operated to a large extent by 'feel'", i.e. "they corrected largely by implicit rules..." However, as DeKeyser (2003) points out, the underlining of the errors in the test, combined with the dichotomous nature of many of the rules, means that in many cases the subjects could have simply guessed the correct forms. If that was indeed the case, then implicit knowledge exhibited by Green and Hecht's subjects was overestimated. It seems that in order to eliminate the effect of guesswork, a more challenging test needs to be devised. A study in which such a test is administered is reported in the present paper.

Another often quoted finding reported by Green and Hecht (1992) is related to rule difficulty. Grammar rules vary in how straightforward they are and, thus, how successful learners are in applying them. As far as Green and Hecht's subjects are concerned, the rules with high success rates "were those that (1) referred to easily recognized categories; (2) could be applied mechanically; (3) were not dependent on large contexts". Rules which meet these characteristics are behind the phenomena exhibited in sentences (1) – (3) above. The pedagogical recommendation that Green and Hecht make is that it is rules like these that should be the focus of grammar instruction in foreign language teaching.

3. The study

3.1. Research question

The aim of the study is twofold. First, it is to examine how well Polish learners of English can cope with correcting errors that are not indicated in any way; i.e. something very similar to the self-correction they normally perform when

drafting their own texts. Second, the study analyses whether learners' capacity to correct grammatical mistakes is in any way influenced by the type of knowledge (explicit/implicit) that they possess. In accordance with DeKeyser's (2003) hypothesis that the role of implicit knowledge for error correction might have been overestimated by Green and Hecht (1992), the following research question was formulated:

What is the correlation between L2 learners' ability to correct grammatical errors which are typically found in written texts produced at their level, and their explicit knowledge of the relevant grammar rules?

3.2. Participants

The participants of the study were 150 Polish L2 learners of English. They were divided into three groups, A, B and C, each consisting of 50 subjects. The learners in groups A and B were secondary school pupils attending English instruction in their school at the intermediate and upper intermediate level respectively. The learners in group C were third year students of English at the School of English, Adam Mickiewicz University, Poznań, Poland. The level of difficulty of the second year practical English examination in the School corresponds to the Cambridge Certificate of Advanced English. The characteristics of the three groups in terms of age, gender, exposure to formal English instruction and time spent in English speaking countries are given in Table 1.

Table 1. Groups A, B and C: basic participant characteristics

	Group A	Group B	Group C
mean age	16.9	16.5	22.6
Males	18	13	15
Females	32	37	35
average exposure to formal English instruction (in years)	8.1	8.6	12.4
average time spent in an English speaking country (in weeks)	0.6	0.7	5

3.3. Method: materials, procedure and analysis

Each group of learners was administered a separate test consisting of twelve test items. A test item was either a single sentence, or a sequence of two or three sentences. Ten items out of the twelve in each set contained one grammar error each. The presence of the items without errors, in addition to a lack of any error indicators in the erroneous ones, was meant to minimize the chances of the learners guessing the corrections. The instructions the subjects were given on their test sheets specified both the number of items with errors, and the fact that each erroneous item contained only one grammar error. The learners were also asked to formulate the rules as if they were trying to help a class mate to understand a given point. The test proper was preceded by a brief background questionnaire, the findings of which are presented in Table 1.

As was the case in Green and Hecht's (1992) study, the errors were chosen according to two criteria. First, they were typical errors that Polish L2 learners of English at comparable levels of proficiency actually made in written communicative tasks. Two types of tasks were investigated: informal letters and argumentative compositions/essays written as part of the instruction process. In order to ensure that the subjects were dealing with authentic errors, typical of their level, all the items in the error correction tasks were corpus-based. In the case of university students, the test sentences came from the Polish part of the International Corpus of Learner English or ICLE (Granger 1998). More specifically, they came from the error concordancer which was developed for the Polish collection of essays. This means that each error selected for the test had been classified as such by a native speaker marker.¹ As for the secondary school students, over 150 pieces of writing produced during a "Mock Matura exam" in one of the schools in Poznań were collected, assembled into small corpora on the basis of the levels of the learners, and subsequently analysed with respect to particular areas of grammar.

The second criterion used in selecting the errors was that all the rules relevant to the violations had been covered explicitly by each group of learners as part of their English syllabus. In theory, then, the learners were equipped with the declarative knowledge needed to identify and correct each erroneous item.

Administering a separate test to each group of students represents a departure from Green and Hecht's design, in which a single set of twelve sentences was administered to all the groups, i.e. beginners, intermediate and advanced students. The move was motivated mainly by the differences in the types of errors made by the three groups of Polish learners. For example, there were a large number of basic agreement errors in the writing of intermediate learners, and very few errors of this type in academic essays. As a result, it seemed highly

unlikely that advanced students would commit such errors in their own writing, and consequently that they would have to correct them. Also, the essays of advanced students differed considerably from that of intermediate ones in terms of syntactic complexity. Finally, the "strong interface" between implicit and explicit knowledge, discussed in the first section of this paper, implies a process of automatization of procedural knowledge. As a result, it is at least theoretically possible that, due to the process of transforming explicit knowledge into implicit, the former type might have already been lost, in the case of advanced students trying to provide rules for very basic structures. Given such significant differences, it seemed a much better solution to devise a separate test for each of the three groups of students.

Another difference between Green and Hecht's study and the one presented here was that no group of native speakers was used in the study proper: examining native speakers' performance with rules and corrections is outside the scope of this paper. Further, since native speakers possess fully-fledged linguistic competence, i.e. one with no gaps that would necessitate guessing whether a sentence is correct or not, it seems that their performance is less likely to be influenced by the design of the test. This means that the conclusions reached in this respect by Green and Hecht probably do not require further investigation.

A group of ten native speakers of British English was used, however, in the preparatory stage of the study. All of them were lecturers at Adam Mickiewicz University. They were administered the test in order to determine its validity, i.e. to make sure that the test items were free from grammatical rule infringements other than those selected for the study. The judgements of the native speakers in general concurred with those of the researchers. In the few cases in which there were discrepancies, modifications were introduced along the lines suggested by the natives. All the items ultimately used in the experiment, together with the standard corrections and relevant generalizations, can be found in the Appendix.

The tests were administered to each group of learners during their regular class meetings. The learners had an unlimited time to complete them. Before administering the tests the researchers used example sentences to illustrate the process of correction and rule provision. The learners were also asked to write the relevant rules in their native language.

Each of the corrections and rules provided by the subjects was marked by both of the researchers. Any changes in the sentences made by the subjects in addition to the corrections were ignored. Since assessing the rules was to some extent a subjective matter, in a number of cases there were discrepancies between the researchers' judgements. These were arbitrated by a third referee.

The marking criteria for rules exactly followed those of Green and Hecht (1992: 171-172). This means that a liberal approach to what counted as an acceptable rule was adopted: no technical terms were required, inaccuracies in the metalanguage were accepted, and the degree of rule generality was allowed to vary.

3.4. Results

Since much of the discussion presented here is in relation to Green and Hecht (1992), the form of data presentation has also been modelled on theirs. Table 2 below shows the success rates for corrections and rules achieved for each sentence by each group (sentences 5 and 10 were correct in each group). In Table 3, a number of specific relationships between rules and corrections are shown.

Table 2. Success rates

Item	Group A		Group B		Group C	
	Correction (out of 50)	Rule (out of 50)	Correction (out of 50)	Rule (out of 50)	Correction (out of 50)	Rule (out of 50)
1	41	41	22	19	42	39
2	3	0	5	5	33	28
3	10	13	11	14	11	7
4	43	37	20	20	48	42
5						
6	36	22	32	33	11	5
7	26	23	36	35	47	39
8	12	12	19	19	42	40
9	17	10	11	5	22	17
10						
11	35	24	33	33	27	20
12	22	4	10	5	6	5
Total	245	186	199	188	289	242
%	49.0%	37.2%	39.8%	37.6%	57.8%	48.4%
ALL	Correction (out of 1500)			Rule (out of 1500)		
Total	733			616		
%	48.9%			41.1%		

Table 3. Relationships between rules and correct sentences

	Group A	Group B	Group C	All
percentage of correct rules associated with correct corrections	92%	90%	99%	94%
percentage of correct corrections not associated with correct rules	30%	15%	17%	21%
percentage of incorrect rules associated with correct corrections	26%	12%	15%	18%
percentage of no rules associated with correct corrections	22%	7%	22%	17%

In order to determine the strength of the association between error correction and explicit knowledge in this study and in Green and Hecht's (1992) experiment, statistical analysis using the Phi coefficient was carried out. The resulting values of the index for each of the groups are as follows: ²

Table 4. The correlation coefficient

this study	Green and Hecht
Group A: Phi=0.66	Beginners: Phi=0.37
Group B: Phi=0.80	Intermediate: Phi=0.44
Group C: Phi=0.81	Advanced: Phi=0.05
	University : Phi=0.2

3.5 Discussion

As has already been said, Green and Hecht's (1992) learners were more successful with corrections than with rules: the ratio between the former and latter was 78 to 46 per cent. Moreover, an average success rate of 78 per cent in an error correction task appears to be quite high. However, the changes in the design of the present study caused the task to be significantly more challenging for the learners, as they achieved only 49 per cent of all the possible corrections. This result was to be expected: the errors were not underlined and the subjects

had to identify them by themselves, which also made the task more authentic with respect to correcting one's own written texts.

Although, in general, the learners were still more successful with providing corrections than with rules, the difference between the two was reduced noticeably: the ratio here was 49 to 41 per cent. Furthermore, the Phi coefficient values for each of the groups in this experiment were also much higher than the values of the coefficient for Green and Hecht's groups. This result means that the design of the test did lead to a significantly higher correlation between the subjects' knowledge of rules and their ability to correct. In our view, this result stems from the learners inability to guess the correct forms. If this interpretation of the data is correct, then, in Green and Hecht's case, the contribution of implicit knowledge is overestimated due to the influence of the guesswork factor.

An important observation Green and Hecht make is that although the knowledge of rules does not impede the learners, and 97% of correct rules were followed by correct corrections, it does not seem to help either. What they found particularly telling in their study was that in 70% of cases when the students gave an incorrect rule and in 55% of cases when they gave no rule at all, they were still able to correct a given structure.

In the present study, similarly, having a correct rule virtually guaranteed a good correction: as Table 3 row 1 shows, when a correct rule was produced, that was accompanied by a good correction in 94 per cent of the cases. The figures in the other rows in Table 3, on the other hand, depart drastically from Green and Hecht's data. Firstly, only 21 per cent of the correct corrections the learners provided in this study were not associated with appropriate rules. Secondly, only in 18 per cent of the cases in which our learners produced an incorrect rule, and in 17 per cent of the cases in which they produced no rule at all, were they able to arrive at a good correction. In general, in 83% of cases where the rule was not present or incorrect, the learners did not produce a correct sentence. As a result, these figures seem to bear out the prediction that if learners do not possess explicit knowledge, they are also unable to correct an ungrammatical structure.

Another (partial) departure of the data in Table 2 from Green and Hecht's results has to do with the learners' ability to become better at correction as they gain more experience in the target language. Green and Hecht's subjects became consistently better as their experience increased; the subjects in the present study followed a different pattern: although the advanced group of university students was the most successful, the intermediate group did better than the upper-intermediate one. This result may at first seem surprising: it is natural to expect, and this expectation is borne out by Green and Hecht's results, that the amount of instruction will influence learners' ability to correct errors. However, it needs

It should be pointed out that all the subjects in Green and Hecht's study dealt with the same set of sentences. This means that more linguistic experience in their case naturally led to improvements in the ability to handle certain types of errors, particularly those of a more fundamental character. By contrast, each group of learners in this study was faced with the complexity of structures and problem areas characteristic of its own level. In such a situation, the success rates in handling errors need not be related to levels of L2 proficiency.

Another issue that seemed worth investigating was the types of rules learners were successful with, as well as the strategies they employed in providing them. According to Green and Hecht, their subjects had the most success with rules that referred to easily recognizable categories and those that could be applied mechanically, an example being the choice between "some" in affirmative sentences and "any" in questions and negatives.

In this study, the subjects were often able to provide rules which did not refer to easily recognizable categories and required familiarity with fairly complex structural and semantic notions. One such example involved conditional sentences:

Test item:

I forgot to set the alarm clock and overslept. If I didn't take a taxi, I would have missed my plane

Correction:

If I hadn't taken a taxi I would have missed my plane.

Rule:

The sentence should contain the 3rd Conditional, since it refers to a past situation.

Also, in a number of cases, the rules contained fairly sophisticated metalinguistic terminology; the example below shows how a student dealt with verb patterns:

Test item:

I suggested to leave very early in the morning.

Correction:

I suggested leaving very early in the morning.

Rule:

The verb 'suggest' is followed by a gerund

In situations where the learners had problems formulating typical textbook rules, they resorted to other strategies, such as providing rules of thumb, which

can be described as “informal pedagogical formulations of limited validity and scope” (Westney, 1994: 77). A typical example was the way students dealt with conditional constructions:

Test item:

Thank you for agreeing to look after my dog. If you will have any problems with it, please call me.

Correction:

If you have any problems with it, please call me.

Rule:

“If” cannot be followed by “will”

Where the students lacked metalinguistic terminology, they tried to make sense of the target grammar by referring to L1 based explanations, and forming a link between their knowledge of Polish and English structures. This was the case with, for instance, combinations of verbs and prepositions:

Test item:

I can't go out now. I am waiting to an important phone call.

Correction:

I can't go out now. I am waiting for (...)

Rule:

It should be “czekać na”= wait for, and not “czekać do”

A thorough discussion of the present data in relation to rule difficulty is beyond the scope of this paper. Below, translated examples of rules from three top scoring categories in each group are given. In our view, this issue certainly merits further investigation.

Table 5. Group A – top scoring categories and examples of rules

1. Simple Present for routines (success rate 82%)	2. Simple past for actions at a specified past time (74%)	3. Do-support (48%)
simple present is used for repeated actions simple present is used for routine actions	'go' in the past tense changes to 'went' time of the action is given so we use simple past	in questions in the present simple we use 'do' in the present simple 'do' and 'does' are operators

Table 6. Group B – top scoring categories and examples of rules

1. Simple past for actions at a specified past time (70%)	2. Subject-verb agreement (66%)	3. Modal past (66%)
if a specific point in the past is given, the simple past is used exact time of the action is given, so we use the simple past	'many teenagers' is plural so we must use have the subject is in the plural	'must' is not a past tense form the past tense form of 'must' is 'had to'

Table 7. Group C – top scoring categories and examples of rules

1. Verb + gerund (84%)	2. Inversion in questions (80%)	3. Present continuous for change in progress (78%)
'prevent' is used with 'from', it is not used with the infinitive 'prevent' is used with the preposition 'from' and a gerund	we need inverted word order in a question it is a question so we invert subject and verb	when talking about a change in progress we use present continuous the phrase 'at the moment' indicates an action happening now – continuous aspect must be used

4. Conclusions

The study reported here indicates that correcting errors in written texts is a difficult task for Polish foreign language learners. However, what is particularly interesting is the interplay of explicit knowledge and the ability to correct grammatical mistakes. As DeKeyser (2003) points out, tests of implicit and explicit knowledge are not equally sensitive. Implicit knowledge is often overestimated, because learners can guess answers or corrections; explicit knowledge is underestimated, since formulating rules is difficult. Also, explicit rules taught in the initial stages of instruction may simply be forgotten after years of using the language, which may have been the case with advanced learners in Green and Hecht's study: some of the errors they were asked to correct were of a rather basic nature. It seems to us that through making it difficult to guess corrections and through asking each group of learners to handle errors pertaining to their own proficiency level, the measurement of implicit and explicit knowledge in this experiment was more accurate than in the original study.

The present study uncovered a significant correlation between explicit knowledge and correct corrections. It does not follow from that, of course, that there is a causal relationship between the two. However, since the correlation is strong, it does not seem unreasonable to assume that at least in some cases a causal link is present and that explicit knowledge of rules plays a more significant role in error correction than claimed by Green and Hecht (1992).

Which rules should be selected for explicit instruction, and which for implicit, has been a matter of debate (e.g. Krashen, 1982, 1994; Green and Hecht, 1992; Hulstijn and de Graff, 1994, Hulstijn, 1995, Robinson, 1996; Housen et al, 2005; R. Ellis, 1997, 2006; DeKeyser, 1998, 2003). The prevailing view seems to be that it is easy rules that should be focused on in explicit teaching. Yet, in this study, learners at different proficiency levels were often capable of handling relatively complex linguistic notions and metalanguage. Additionally, although rules of thumb and simple metalinguistic formulations can be found in Polish textbooks for SLA students, comparisons between L2 and L1 are fairly uncommon. It seems to us that all of these phenomena are legitimate targets for instruction, particularly in view of the fact that, our learners were able to relate the rules concerning them to the relevant sentences.

Another pedagogical implication of the study is that if explicit knowledge is beneficial to students in the task of correcting errors typical for their level, it should prove useful for self-correction as well. As a result, teaching explicit grammar ought to accompany teaching writing skills, as it consequently might result in helping learners to draft more accurate texts in terms of the target code.

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Notes

1. Information about the Polish sub-corpus of ICLE can be found at the following address: <http://www.staff.amu.edu.pl/~przemka/picle.html>. Access to the error concordancer: http://ifa.amu.edu.pl/~kprzemek/PICLE_search.php
2. The values of the Phi coefficient are not provided by Green and Hecht (1992), so they were calculated for their groups by the authors of the present study.