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Noticing grammar in L2 writing and problem-solving strategies

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Abstract

Noticing plays an important role for second language acquisition. Since the formulation of the output hypothesis (Swain, 1985), it has been proven that producing output can lead to noticing. Studies on noticing have revealed little focus on grammar, and an in-depth investigation of grammar noticing has not been conducted so far. Studies into problem-solving strategies applied to resolve noticing in writing have provided differing classifications. The current study investigates the noticing of ten young learners (15 to 16 years) of L2 English while performing a writing task, with a special focus on grammar. The problem-solving strategies these learners applied are analyzed. With regard to the linguistic areas, results suggest that verb forms, especially the use of modals, and the choice of prepositions, are the main issues encountered in morphology. In syntax, learners mainly dealt with the length of sentences and the ways of connecting clauses. Learners relied on their intuition and existing knowledge, common sense and rephrasing as grammar problem-solving strategies. These results open a new area of study into noticing grammar and suggest some implications for teaching.

Keywords: L2 writing; noticing; output; problem-solving strategies; grammar

1. Introduction

Since the 1980s and early 1990s, the concept of noticing linguistic features in second language (L2) input and output has been investigated by a number of researchers (for a summary concerning noticing the gap while writing, see Williams, 2012). Due to its potential to facilitate second language acquisition (SLA), noticing and related concepts have found their way into SLA studies as well as pedagogically oriented research. The nature of noticing as well as possible ways to promote noticing L2 features have been investigated (e.g., Hanaoka, 2007; Qi & Lapkin, 2001; Williams, 2001). The studies so far have revealed a strong focus on lexical issues and much less focus on morphosyntactical features of the L2 (e.g., Hanaoka & Izumi, 2012; Williams, 1999).

Encountering a linguistic problem while producing L2 output may stimulate noticing when the learner is supplied with the respective L2 input (e.g., Qi & Lapkin, 2001). One of the possibilities to generate input is using problem-solving strategies such as dictionary search. Other problem-solving strategies which do not require external input are also available to learners. So far, not many studies have investigated noticing in L2 writing in connection with the application of problem-solving strategies. The current study has set out to analyze the linguistic problems learners encounter while producing a text in their L2 English and the problem-solving strategies they use in order to deal with their problems. The focus in the present study is on morphosyntactic issues which have so far received little attention in related research. An in-depth qualitative analysis of the nature of learners' focus on grammar is provided in a small-scale study with ten German teenage learners of English.

2. Noticing and related concepts

Learners' ability to reflect upon language and their own language use has been discussed and investigated using different concepts such as *language and metalinguistic awareness*, *noticing*, or *learner-initiated focus on form*. The concept of noticing dates back to Schmidt (1990), who pointed out the role of noticing in second language (L2) input for second language acquisition. Swain (1985) formulated the output hypothesis in which she states that noticing can also happen when learners produce output, which indicates that output also has a noticing/triggering function (see also Izumi & Bigelow, 2000, p. 244). According to the output hypothesis, noticing in output production can be triggered by external feedback (coming from an interlocutor) or internal feedback (initiated by the learners themselves). As a reaction to noticing, learners analyze the problem and either come up with a solution which leads to modified output, or they turn

to additional input in order to find a solution to their problem. A number of studies have been conducted which have attempted to verify the output hypothesis by testing the effect of noticing in output on second language acquisition (Adams, 2003; Hanaoka, 2007; Izumi, 2002; Izumi & Bigelow, 2000; Izumi, Bigelow, Fujiwara, & Fearnow, 1999; Uggen, 2012). Although much research still has to be done to prove the hypothesis that noticing in the output leads to acquisition, the research conducted so far has at least confirmed that noticing can facilitate the process of second language acquisition (Williams, 2012). This insight stresses the importance of investigating the nature of noticing in producing L2 output.

In a large body of research on noticing in L2 writing, the output hypothesis is tested by using external corrective feedback as linguistic input and investigating the learners' reaction to it. The point of interest is whether learners will notice the gap between their own formulations and some kind of input or feedback (implicit or explicit), be it error correction (Ellis, Sheen, Murakami, & Takashima, 2008; Heift & Rimrott, 2008; Varnosfadrani & Basturkmen, 2009), a native speaker reformulation of the learner text (Adams, 2003; Lázaro Ibarolla, 2009; Qi & Lapkin, 2001), or a text written by a native speaker of the target language on the same topic, but independently of the learner text (Hanaoka, 2007), and how this noticing will influence subsequent output and language acquisition. Another approach to investigating noticing after output production is presenting learners with input in the form of a reading text containing a certain target structure (Uggen, 2012). The possibility of consulting reference materials to resolve linguistic problems is mentioned by Williams (2012), but research so far has not investigated this option. The present study attempts to fill this gap by having learners deal with their noticing in the process of writing without teacher intervention and by using problem-solving strategies to generate additional linguistic input, including external resources such as dictionaries and the internet.

A pedagogical approach related to the notion of noticing and language awareness is *focus on form* (e.g., Doughty & Williams, 1998), which is investigated as teacher-initiated and learner-initiated focus on form. Studies into learner-initiated focus on form in communicative tasks and its possible effects on SLA were conducted by Williams (1999, 2001). Williams (1999) analyzed the linguistic focus of learner-initiated attention to form (lexis or grammar), the ways learners draw attention to form, the activity types during which learners attend to form, and the influence of proficiency on learner-initiated focus on form. Williams (2001) investigated the effectiveness of spontaneous attention to form by using tailored tests and spontaneous production. In addition, she compared the effects of learner-initiated and teacher-initiated attention to form.

Various methodologies have been used to measure noticing or linguistic awareness. In quasi-experimental studies with a pretest-posttest design, quantitative

measures such as grammaticality judgments or correction tasks are used (e.g., Ammar, Lightbown, & Spada, 2010; Masny, 1997). More qualitative and descriptive measures include think-aloud protocols while conducting a task (Armengol & Cots, 2009; Swain & Lapkin, 1995), recorded interaction (Kiely, 2009; Kormos, 1999), learners' written notes about noticing (Edstrom, 2006; Hanaoka, 2007), or qualitative or retrospective interviews (Dégi, 2010). Each of these methods has its strengths and drawbacks concerning the completeness and quality of the collected data (for some discussion, see Bowles, 2010; Hanaoka, 2007).

Noticing and related concepts are often operationalized as *language related episodes* (LREs) (see, e.g., Qi & Lapkin, 2001; Shekary & Tahririan, 2006; Swain & Lapkin, 1995). Swain and Lapkin (1995, p. 378) identify a language related episode as "any segment of the protocol in which a learner either spoke about a language problem he/she encountered while writing and solved it either correctly . . . or incorrectly . . ., or simply solved it (again, either correctly or incorrectly) without having explicitly identified it as a problem." Some studies use different terminology such as, for example, *hypothesis-testing episodes* (Shehadeh, 2003), *form-focused episodes* (Zhao & Bitchener, 2007) and *awareness episodes* (Armengol & Cots, 2009). The classifications of LREs offered by the studies strongly differ, ranging from a distinction between form, lexical and discourse LREs (Qi & Lapkin, 2001) to various differentiations of linguistic levels such as orthography, punctuation, morphology, and so on (e.g., Armengol & Cots, 2009; Whalen & Ménard, 1995).

3. Noticing grammar

Studies into noticing linguistic features in the output so far have revealed that learners mostly focus on lexical and other surface levels of linguistic processing, with little focus on grammar (Hanaoka & Izumi, 2012; Qi & Lapkin, 2001; Swain & Lapkin, 1995; Whalen & Ménard, 1995; Williams, 1999). They also suggest that with increasing proficiency, the frequency of morphosyntactic LREs increases (Williams, 1999). An in-depth analysis of which grammar-related features learners spontaneously attend to has not been conducted so far. The current study aims to offer some insights into the nature and quality of morphosyntactic LREs and shed light on the problem-solving strategies learners employ to resolve these LREs in the process of writing.

In order to investigate noticing grammar forms by learners, communicative tasks such as the *dictogloss* are used to push the learners towards the use of a specific grammatical item (Nassaji & Fotos, 2004). The focus of studies into noticing grammar or grammar teaching is often on a discrete grammar point such as conditionals, past tense, questions, the plural, or the use of articles (e.g., Izumi & Bigelow, 2000; Mackey, 2006; Song & Suh, 2008). The interest of the

current study was to find out which grammatical features learners notice if they are confronted with a spontaneous written production task without selecting an explicit target form. Thus, it is possible to see which forms learners actually notice, and these can be compared with the forms used in studies on grammar.

4. Problem-solving strategies

Strategies have been classified in various ways in L2 research. Cohen (1996, p. 2) distinguishes between *language learning* and *language use strategies*. In contrast to language learning strategies, language use strategies do not have learning as their primary goal, but they can still lead to learning. In the area of spoken language use or *communication strategies*, *reduction* and *achievement strategies* are distinguished (Færch & Kasper, 1983). When using reduction strategies, a learner changes the communicative goal (functional reduction) or the structure of the utterance (formal reduction) in order to avoid the problematic linguistic feature. When using achievement strategies, learners solve their problems by expanding their communicative resources (Færch & Kasper, 1983, p. 45). A similar distinction is provided by Uzawa and Cumming (1989) for writing, who distinguish between *keep-up-the-standard strategies* (as compared to L1 writing) and *lower-the-standard-strategies*.

To my knowledge, there have been two attempts to qualitatively classify problem-solving strategies used by L2 writers. Cumming (1989) distinguishes between *knowledge-telling*, which does not involve any problem-solving processes, and *heuristic search strategies*, which are applied when a problem has been encountered by the learner. The heuristic search strategies are further divided into the following strategies: engaging a search routine; directed translation or code-switching; generating and assessing alternatives; assessing in relation to a criterion, standard, explanation, or rule; relating parts to whole; and setting or adhering to a goal. Swain and Lapkin (1995) identified the following problem-solving behaviors in their qualitative study of young L2 writers: sounds right/doesn't sound right; makes sense/doesn't make sense; lexical search (via L2); lexical search (via L1 or both L1 and L2); translation (phrase or greater); and applying a grammatical rule. Some of the strategies identified in the two studies correspond to each other, but the differences in the classification, in the terminology as well as the fact that there are just two studies of this sort, suggest that some further research into the use of strategies in the L2 writing process is needed.

The current study is an attempt to connect the above-mentioned areas of research, investigating grammar noticing in writing and, at the same time, linking it with the problem-solving strategies learners apply to resolve their problems.

5. Research questions

The aim of this study is to offer a qualitative investigation of how learners reflect on grammatical phenomena when asked to compose a text. Through an in-depth analysis of learner-initiated noticing in a writing task with a given topic, it can be seen which phenomena are noticed by the learners. The strategies learners use to deal with their grammar-related queries are investigated to see how they deal with their problems if there is no intervention, but sufficient linguistic resources (i.e., dictionaries, internet access) are available. The analysis is based on the following two research questions:

1. Which grammar-related features do young (15- to 16-year-old) L2 learners notice when writing in English?
2. Which problem-solving strategies do young (15- to 16-year-old) L2 learners of English use to deal with their grammar-related noticing in English?

6. Research design

6.1. Participants

The participants were ten 15- to 16-year-old learners of English at German schools who all shared German as their mother tongue. Two of the participants were growing up bilingually (German plus another language) and the number of foreign languages learned ranged from two to five. Most of the participants attended German secondary school (called Gymnasium),[1] and two of them the German Realschule.[2] The participants' grades in English ranged from 1 to 4 (1 being the best grade, 6 the worst). Considering the expected proficiency level in this age group at German schools, the learners were at the B1 level of the *Common European framework of reference for languages* (Council of Europe, 2001). There were five male and five female participants. The objective of the research study was explained to all participants and their parents, and they were asked to sign an informed consent form.

6.2. Think-aloud protocols and stimulated recall interviews

An individual data collection session was conducted with each participant. In order to acquire rich data on noticing in the process of writing and problem-solving

[1] A type of school which covers school grades 5 to 12 and ends with a maturity examination which enables a person to start university studies.
[2] A type of school which covers school grades 5 to 10 and ends with a school leaving certificate which enables a person to take up vocational education.

strategies, a combination of two data collection methods was used. First, the participants were asked to think aloud while composing a paragraph on the following topic: "If you could restrict the school subjects to two, which would you choose and why?" They were allowed to choose the language in which they verbalized or to switch between the two languages. They were provided with bilingual and monolingual dictionaries as well as a computer with internet access to use for any type of query. There was no time limit to the tasks and the participants were asked to write a paragraph which they would also hand in at school for grading. The think-aloud session was recorded on video which captured the task sheet. The video recording allowed the researcher to determine whether the participants were only verbalizing or also writing at the same time, and whether they were writing without verbalizing. Any nonverbal behavior which was not captured on the video recording (this was mainly dictionary and internet search and the retrieved results) was noted by the researcher and later included in the transcripts. The think-aloud protocols were chosen among the methods mentioned above because they have been the most widely used method to capture learners' mental processes (Uggen, 2012, p. 509).

As recommended by Ericsson and Simon (1993), the concurrent think-aloud protocols were combined with retrospective reports to counter the issue of incompleteness of the reports. For this reason, a stimulated recall interview took place immediately after the think-aloud session in which the video recording of the think-aloud session was used as a stimulus. The researcher stopped the video at points where the participant stopped verbalizing (suggesting that some thinking took place at this point which could be recalled and verbalized in the stimulated recall interview) and at points where some noticing was obvious, but it was not clear what was noticed and how the participant arrived at a specific decision. The participant was then asked to recall and verbalize their thoughts at that moment of the recording. The participants were also explicitly allowed to stop the recording at any time and comment on their thoughts. The stimulated recall interviews took place in German and they were audio-recorded.

As there was no time limit set for the writing task to account for the fact that thinking aloud may slow down the execution of a task (Bowles, 2010), the duration of each session varied between 24 and 101 minutes (with 7 to 34 minutes for writing and 16 to 67 minutes for the stimulated recall interview), depending on the time the participants needed for writing.

6.3. Transcription and coding

The data was transcribed based on the VOICE transcription conventions (VOICE Project, 2007) which were adapted according to the requirements posed by the

particular types of data. The coding procedure roughly corresponds to the grounded theory coding (Glaser & Strauss, 1967) and was conducted according to the recommendations specified by Kelle and Kluge (2010). Starting with open, data-driven coding, a system of categories was developed and a hierarchy created. The developed categories were compared with existing research and adapted to it to ensure comparability. In the think-aloud protocols, the coding unit was a language related episode (LRE) in line with most of the previous studies (see above). The stimulated recall interviews did not receive their own codings but served to identify the LRE types and problem-solving strategies in the think-aloud protocols.

7. Results

7.1. Grammar LREs

This section presents results with regard to Research question 1 (Which grammar-related features do young [15 to 16-year-old] L2 learners notice when writing in English?). Among the LREs identified in the think-aloud protocols, morphological and syntactical LREs were selected for the analysis of grammar-related LREs, corresponding to the grammar or morphosyntactic episodes mentioned in the existing literature (Hanaoka, 2007; Swain & Lapkin, 1995; Williams, 1999). Pure lexical and spelling LREs were not considered as they involve only word choice (not word forms) decisions and LREs above the sentence level were also excluded due to the missing link to what is commonly subsumed under the term *grammar*. Of the 188 LREs produced by the ten participants, the majority (119) were related to lexis whereas only 36 were related to grammar.

Morphological LREs were defined as LREs in which the participant looks for the right form of a word. The following example from a think-aloud protocol illustrates a morphological LRE:

> which is spoken spoke (.) spoken all over the world (.) speaken nein spoken
> English translation: *which is spoken spoke (.) spoken all over the world (.) speaken no spoken*

There were altogether twelve morphological LREs in the whole data set. These were produced by five of the ten participants of the study, with two participants (M7 and F10) producing four morphological LREs each. The word classes which were the focus of the morphological LREs were verbs, nouns, prepositions, word class choice and one article. A list of the morphological LREs including precise information about the focus is shown in Table 1. As evident from the table, the forms and uses of modal verbs occurred three times. Other LREs which dealt with verbs concerned tense choice and the correct form of a past participle. Prepositions used together with specific nouns also were a matter of interest.

Table 1 Focus of morphological LREs and the strategies used to resolve them

Broad focus	Narrow focus	Example/s from TA protocols	Problem-solving strategies
Verb forms (5)	Modality/Modals (3)	*Can* vs. *could* *Is* vs. *would be* Alternatives to the use of *can* after infinitive particle *to*	Reasoning (3) and/or Applying rules/explicit knowledge (3) Re-phrasing (avoidance strategy) (1)
	Tense choice (1)	Use of past simple for finished events (*we learned*)	
	Past participle (1)	Past participle of *speak*	
Prepositions (3)		Prepositions needed with *school, street, shower*	Intuition or Automatic application of knowledge (2) Re-phrasing (avoidance strategy) (1)
Nouns (2)	Plural/singular choice (1)	*One of the most important* + plural or singular	Reasoning (1) with Applying rules/explicit knowledge (1)
	Plural/singular form (1)	Spelling of *ability* (confused by plural *abilities*)	
Word class choice (1)	Adjective vs. adverb (1)	*Normal lesson* vs. *normally lesson*	Intuition (1)
Article choice (1)		Indefinite *a* vs. *an*	Intuition (1)

Note. The strategies relate to the broad focus of the LREs, not to the narrow focus or specific examples. The number of occurrences is shown in brackets.

Syntactical LREs were defined as questions of word order, sentence length, and punctuation. The following example from a think-aloud protocol illustrates a syntactical LRE:

> because i think that it's er late (.) necessary later (.) i think it's (2) later necessary erm (1) i think that it's (5) later necessary (.) necessary later (4) because i think that it's necessa- (.) later {adds "later" between "it's" and "necessary" }

In the data set, 24 syntactical LREs were identified. Most participants produced between one and four syntactical LREs, but participant F10 produced eight syntactical LREs. The focus of the syntactical LREs was mainly on sentence length and connecting clauses. Some of these issues were also combined in one LRE (e.g., a learner decided to make his or her sentence longer, which is why he encountered the issue of how to link the new clause to the existing one). In addition, three LREs were concerned with word order and four LREs with other syntactical issues. For an overview, see Table 2.

Table 2 Focus of syntactical LREs and the strategies used to resolve them

Broad focus	Narrow focus	Example/s from TA protocols	Problem-solving strategies
Sentence length (9)	Avoiding long sentences (5)	Splitting a complex sentence into two separate sentences	Re-phrasing (7) Applying rules/explicit knowledge (2)
	Creating long sentences (4)	Adding a new clause to a sentence which was already finished (connecting it with *because* or *and*)	
Connecting clauses (7)	Choosing conjunction or punctuation (5)	Deciding between using a comma, using a conjunction, finishing a sentence *Because* not at the sentence beginning	Re-phrasing (3) Re-phrasing (avoidance strategy) (2) Applying rules/explicit knowledge (1) with Reasoning (1) Intuition/automatic application of knowledge (1)
	Choice finite vs. non-finite construction (2)	. . . *we learned much about German history and this is one of the most important things* . . . vs. . . . *we learned much about German history, one of the most important things* . . . *Spanish is a language which is spoken* . . . vs. *Spanish is a language spoken* . . .	
Word order (3)	Position of adverbs (1)	*It's necessary later* vs. *it's later necessary*	Intuition (2) Re-phrasing (avoidance strategy) (1)
	Phrasal verb + object (1)	*Carry out experiments* vs. *carry experiments out*	
	Position numeral and possessive pronoun (1)	*My two favorite subjects* vs. *my favorite two subjects*	
Adapting sentence structure to the lexis used (1)		Using the word *duty* and building the sentence around it (choosing another word would have led to changing the whole sentence)	Intuition (1)
Checking reference of a pronoun (1)		*I also don't write much tests and they are not always so boring.* The learner is aware that *they* could be wrongly related to *tests* which was not intended	Re-phrasing (specifying what is meant by *they*) (1)
Checking the sentence flow (1)		Missing a word for a sentence to sound good	Intuition (adding the filler *even*) (1)
Clause structure (1)		Repeating subject in the second clause of a sentence	Reasoning (1)

Note. The strategies relate to the broad focus of the LREs, not to the narrow focus or specific examples. The number of occurrences is shown in brackets.

7.2. Problem-solving strategies

This section presents results with regard to Research question 2 (Which problem-solving strategies do young [15 to 16-year-old] L2 learners of English use to deal with their grammar-related noticing in English?). The strategies used to resolve morphological LREs are listed in Table 1. For the LREs related to verb forms and nouns, reasoning was the preferred strategy in which learners used their common sense, background knowledge and their intended message to decide about the solution. Alternatively, or in addition to reasoning, the learners applied

their explicit knowledge of rules, for example the knowledge of the infinitive, past, and past participle in verbs which are often learned together, or the knowledge about when a specific tense or verb form should be used. The questions about prepositions were solved either intuitively or the prepositional phrase was avoided and an alternative formulation was chosen (instead of opting for one out of several possible prepositions used with the word *shower*, the learner opted for the formulation *take a shower*).

The strategies used to resolve syntactical LREs are listed in Table 2. The main strategy used to solve issues of sentence length was rephrasing which, in these specific cases, meant that the learner either finished a sentence and started a new one instead of using a conjunction to connect a new clause, or that they added a new clause to a sentence which they originally intended to finish. In one case, a learner applied explicit knowledge stating that long sentences are criticized at school. The rephrasing strategy was used in two different ways to deal with connecting clauses. The first way corresponds to the rephrasing strategy as used for the issues of sentence length. The second way is using rephrasing as functional reduction strategy, hereby changing the content of the utterance. For example, one participant wanted to say that it is important to read books, especially German literature, but he was not able to put all the information into one sentence. As a solution, he decided to leave out the information about German literature, finished the sentence and mentioned the skipped information later in his text. Applying a rule (e.g., that the word *because* should not be used at the beginning of a sentence) was another problem-solving strategy used to solve issues of connecting clauses. Two questions of word order were solved intuitively, one by using rephrasing as a functional reduction strategy (writing *my favorite subjects* and leaving out the numeral *two*, because the participant was not sure about its position in the sentence).

8. Discussion

8.1. The role of noticing in producing L2 output

The finding that lexical issues are the most frequent ones corresponds to previous findings (Swain & Lapkin, 1995; Whalen & Ménard, 1995; Williams, 1999). However, as also noted in previous studies, noticing in other areas including grammar does take place. Based on the limited data gathered in the current study, it seems that learners are concerned more about syntax than about morphology. In addition, all learners encountered syntactical issues whereas just five learners encountered issues of morphology. A reason for this difference may lie in individual learner differences (e.g., their focus on fluency, accuracy or complexity, or their communicative confidence) which could be an area of future research.

The current study has demonstrated the issues which were relevant to learners when they composed in L2 English. In the area of morphology, the choice of correct verb forms was an issue which occurred five times (out of twelve), with the main focus on the use of modal verbs. Interestingly, the choice of a correct tense was an issue that occurred just once in the whole data set. There are two possible reasons for this finding: (1) The task prompted the learners to use mostly the present simple tense or modals (with sentences such as "I would choose subject xy, because it is easy and I could concentrate on my hobbies"); (2) The learners have mastered the tenses to an extent which they perceive as sufficient, which enabled them to notice other issues such as the forms and meanings of modals.

Another issue was the choice of the correct preposition. Even though it did not occur very often (three times in the whole data set), the fact that different participants encountered this issue speaks to its relevance. In two cases, the learners decided intuitively which preposition to use. In one case, the learner decided to choose a different phrasing in order to avoid using a preposition altogether. As the learners had dictionaries and the internet at their disposal, it is notable that they did not use them to clarify their problems, even though there was no time limit to the task. One reason can be that they were very confident about the solution they had come up with and another can be that the correct preposition was not so relevant for them.

The prevailing focus of syntactical LREs was on sentence length and the ways clauses can be connected. Basically, the learners who encountered these issues decided to use either a comma or the conjunctions *and*, *but* and *because* to connect clauses. Two participants decided to use a non-finite construction instead of a finite one. The LREs the participants encountered did not prompt them to look for other possible ways to connect clauses.

Comparing the findings with the foci of the studies into grammar noticing reveals that there was not much correspondence between the issues learners in this study spontaneously focused on while writing and the foci selected in studies into grammar noticing and into teaching grammar such as the use of articles (Bitchener, 2008; Ellis et al., 2008), questions, plurals, or past tense forms (Mackey, 2006). The only slight correspondence is the use of modals by the learners in this study and the use of conditionals in some studies (Izumi & Bigelow, 2000; Song & Suh, 2008).

Regarding the use of problem-solving strategies, the data revealed that learners did not turn to additional resources to deal with their grammar LREs even though these would have been available and there was no time limit. Rather, they solved their problems intuitively, rephrased their utterances, or applied logical reasoning. The reason why grammar-related LREs are solved using the learner's own resources may lie in time management (finding a solution for a grammar issue may take longer than for a lexical issue), or in previous instruction (it cannot be excluded that the main focus in teaching how to use a dictionary is on finding single words).

Explicit knowledge was used seven times to find a solution. This provides insights into some of the rules apparently taught at school, such as "do not use *because* at the beginning of a sentence" or "avoid long sentences."

In morphological as well as in syntactical LREs, rephrasing occurred as avoidance strategy. In morphological LREs, it could be specified as formal reduction strategy where the content is kept, but a different formulation is chosen. In syntactical LREs, it was the functional reduction strategy where the originally planned utterance was not put on paper. However, the intended message was kept for later and used in a different sentence.

A comparison to the strategies identified by Cumming (1989), and Swain and Lapkin (1995) reveals that using intuition and applying rules occurred in the current study as well as in the two previous studies on problem-solving strategies in writing. Rephrasing and reasoning are strategies unique to the current study.

8.2. Limitations

Even though the current study has been able to offer some new insights into grammar-related noticing and problem-solving strategies, it has got a number of limitations. First, the number of participants was too low to allow for any generalizations. Also the number of grammar-related LREs was very small due to the number of participants and due to the fact that the majority of the LREs were lexical. Thus, the detailed analysis only revealed tentative tendencies regarding the focus of grammar-related LREs and the problem-solving strategies. In addition, the methodology does not capture all mental processes and even though care was taken to elicit as much data as possible, some relevant LREs may have been missed due to them not being verbalized. Although caution was taken in the stimulated recall interviews to ask only about the thoughts at the time of writing, it cannot be ruled out completely that the participants also reported some new thoughts which only occurred to them during the stimulated recall interview and not during the writing process.

9. Conclusions, further research and possible implications for instruction

The current study has been able to open a small window onto the grammar focus of 15- to 16-year-old writers. It has revealed linguistic areas these learners were concerned with when writing in L2 English and shown that some of these areas are not yet represented in research on grammar noticing and teaching. The analysis of problem-solving strategies has shown that these learners relied mainly on their own resources when trying to resolve their grammar-related problems, not using the external resources available. The strategies identified in this study complement the strategies identified in the previous studies.

The qualitative character of the current study with a low number of participants suggests that further research is needed to identify which grammatical features learners notice in a writing task. In addition, it would be interesting to see whether teaching the issues which the learners have encountered would bring about any change in their noticing and in their writing. In addition, some phenomena may be grounded in individual learner differences (for a study into the link between self-correction behaviors in speaking and individual learner differences, see Kormos, 1999). Kormos (2012) stresses the importance of investigating the role of individual differences in L2 writing. Therefore, further research is needed to see how individual learner differences influence noticing and self-correction behavior in writing.

In instruction, finding out which problems learners are concerned with in written language production may be a first step towards instruction which considers the learners' developmental stage (see the processability theory by Pienemann, 1998) and therefore is likely to be fruitful. As pointed out by Williams (2012), the relatively new approach of *writing to learn* looks at L2 writing as a possible instrument for L2 development. A grammar teaching approach which takes the learners' written output as the starting point for explaining grammar is the method of intelligent guessing (MIG) proposed by Angelovska and Hahn (2014). Focusing on the problems learners notice while writing, the teacher may provide them with strategies to deal with these problems, such as more sophisticated ways of connecting sentences or explicit instruction in the use of modals. As noted above, further research would be needed to find out whether there are more topics which the learners find relevant, and to what extent they are already considered in teaching.

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