



Lexical Retrieval Processes and Strategies in Second Language Writing: A Synthesis of Empirical Research

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ABSTRACT

Lexical access and retrieval are essential processes in fluent and efficient second language (L2) oral and written productive uses of language. In the case of L2 writing, attention to vocabulary is of paramount importance, although the retrieval of relevant lexis while composing in an L2 frequently entails different degrees of problem-solving activity given the lack of (automatic) access to the necessary linguistic resources characteristic of L2 communication. When engaged in this problem-solving behaviour, L2 writers have been reported to deploy a range of L1-based and L2-based lexical retrieval strategies. After situating lexical retrieval processes in cognitive views of written production, the main part of this paper is devoted to a review of the available empirical evidence on lexical retrieval processes and strategies in L2 writing. The paper finishes with some conclusions at the levels of theory and research.

KEYWORDS: backtracking, dictionary use, lexical problems, lexical retrieval strategies, L1 use, output practice, transfer, second language writing.

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I. INTRODUCTION: SITUATING LEXICAL RETRIEVAL PROCESSES IN SECOND LANGUAGE COMPOSING ACTIVITY

Lexical retrieval is an essential process in fluent and efficient native language (L1) and second language (L2) oral and written productive language use. In the context of this paper, lexical retrieval processes refer to the access and selection of the relevant lexical items (including both individual words and multiword items. Sinclair, 2004:281) needed to express one's intended meaning in language production activity.

In the case of writing, access to vocabulary is crucial while engaged in the various writing processes propounded in the best known models of L1 or L2 composing (cf. Bereiter & Scardamalia, 1987; de Beaugrande, 1984; Flower & Hayes, 1980, 1981; Hayes, 1996; Kellogg, 1996). These models assume that various processes –basically, planning, formulation, and revision- are responsible for text-construction activity. During *planning*, writers “set goals and establish a plan to guide the production of a text that will meet these goals” (Hayes & Flower, 1980:12). During *formulation* writers transform ideas into language. Finally, during *revision* writers get a mental representation of their texts and also they attempt to solve the potential dissonance between their own intentions and their linguistic expression. As we shall see next, lexical retrieval processes are an integral part of these three macro-writing processes.

I.1. Lexical retrieval processes during planning.

Planning is a thinking process in which writers form a mental representation of the knowledge that they are going to use in their composition and of how they are going to go about the business of composing. Writers plan all the way through the composing process, hence the distinction between “pre-task planning” and “on-line planning” (see Ellis, 2005, and review in Manchón & Roca de Larios, 2007a). Global planning (dealing with ideational and/or textual issues) is frequent in the pre-writing stage, whereas during the writing phase, apart from engaging in global planning, writers also plan at more specific levels; for instance, they may take decisions about paragraphs, sentences, or words.

Lexical retrieval processes are particularly relevant when writers are engaged in what has been termed “text planning” (Hayes & Nash, 1996), which can take two forms: “abstract planning” and “language planning”. *Abstract planning* “leads to production of ideas, notes, and outlines that need to be expanded greatly to produce a finished text” (p. 43). The outcome of *language planning*, in contrast, is text in the form of “a string of words, often a clause or

two, in thought or in speech” which are later written down verbatim (Hayes & Nash, 1996:43). It follows that both abstract and language planning require the implementation of lexical retrieval processes.

1.2. Lexical retrieval processes during formulation.

As mentioned earlier, the process of formulation (or text-generating activity) involves the conversion of ideas into graphic language structures, or, to put it another way, the transformation from one form of symbolization (thought) into another (language). For this process to take place without overloading the writers’ attentional capacity, writers need to have a certain degree of automatic control over their linguistic resources, which includes (automatic) lexical access. However, the overloading of attentional capacities is rather likely due to the intensive problem-solving activity that goes into text generation, as confirmed by a large body of empirical research. For instance, formulation has been found to take up between 60% and 80% of total composition time (Roca de Larios, Manchón & Murphy, 2008; Roca de Larios, Marín, & Murphy, 2001; Wang & Wen, 2002) and to entail greater problem density than in L1 writing: Roca de Larios *et al.* (2001) found that the ratio between fluent and problem-solving formulation episodes was 5:1 in L1 writing as opposed to 2:1 in L2 writing.

This intensive problem-solving activity results in a much more fragmented writing process. As an example, Krings (1989, quoted in Krings, 1994) contrasted text production rates in L1 and L2 and found that the average number of words written per minute were 21.65 in L1 writing, whereas in L2 writing the average was 9.21. Whalen and Ménard (1995:406) also noted that their English university learners of French produced shorter transcription segments when writing in French than when writing in English (2.29 fewer words per segment), and their formulation processes were interrupted by other processes twice as often in L2 writing as in L1 writing. Further confirmation for the problem-solving and more fragmented nature of L2 writing is provided by the analysis of L2 writers’ pausing behaviour (Chenoweth & Hayes, 2001; Friedlander, 1987; Hall, 1990; Sasaki, 2000). Thus, Friedlander (1987) found that the number of words uttered without pauses was 6.33 in L1 writing, nearly 3 times as much as in L2 writing, a condition in which pauses occurred every 2.3 words. Similarly, the participants in Hall’s (1990) study paused significantly more in L2 writing (41 pauses) than in L1 writing (28 pauses), spending almost twice as long on pausing behaviour in the L2 condition (40 minutes) as in the L1 (23 minutes).

This problem-solving activity that characterises L2 writing text-generating processes affects all levels of linguistic processing, and particularly the area of lexis. In fact, even in L1 writing lexical retrieval processes during formulation have been reported to entail a certain degree of cognitive expenditure (Kellogg, 1994). One could expect this to be even more the case in L2 writing given the lack of availability and/or (automatic) accessibility to relevant linguistic knowledge. In this respect, Roca de Larios, Manchón, and Murphy (1996) contend that semantic processing in L2 writing may be subjected to more fragmentation processes than in L1 writing as the sets of options at the writer's disposal in the L2 may be narrower and less consolidated than those in the L1. These expectations have been empirically confirmed in a study in which lexical retrieval was found to correlate far less with writing proficiency in L1 than in L2 writing (Schoonen *et al.* 2003).

1.3. Lexical retrieval processes during revision

We stated earlier that revision is a writing process in which writers have a double goal: they form a mental representation of the text they have produced and attempt to detect problems in it (Hayes, 1996). In this context, part of the possible "dissonance" between intentions and their linguistic expression may be related to lexis. For instance, the participants in Porte's research (Porte, 1996, 1997) reported that the main concern guiding their revision behaviour was vocabulary, and Hall (1990) found that 62% of his participants' (4 advanced, adult ESL writers) L1 revisions and 59% of their L2 revisions focused on single words. In a similar vein, the participants in Whalen and Ménard's (1995) study revised mainly at the language level both in L1 and L2 writing (although the ratio of language-level revisions increased by 10% in the L2 condition), and also they revised most at the word level. More recently, Stevenson, Schoonen and De Gloper (2006) not only showed that more language revisions were made in the L2, but also that there were far more vocabulary revisions..

It is worth mentioning in passing that these findings concur with the research evidence on the most common errors marked by teachers when providing feedback on their students' essays. In her review of the issue, Ferris (2002) reports that lexical errors (which comprise various subgroups related to word form, meaning, and use) amounted to a total of 22% of total errors, thereby forming the second most important group of errors marked (sentence structure being the top priority). It is also worth mentioning that students do not always find it easy to self-correct their vocabulary errors, as noted, for instance, in Kubota's (2001) study of Japanese ESL learners' error correction strategies.

In short, lexical retrieval processes are essential components of all stages of composing. Krings (1994) went as far as suggesting that “when writing in a foreign language, the wide field of lexico-semantic problems plays a much more important role than that of morphosyntax” (p. 109). The aim of this paper is to present a narrative review of the empirical research on writing conducted within the process-oriented paradigm in the last 20 years (1987-2007) in order to synthesise what this research has uncovered regarding lexical retrieval processes and strategies in L2 writing, and to ascertain what this empirical evidence adds to key issues of debate in both second language acquisition and second language writing theory and research. The research synthesis, therefore, serves just the first of the three basic functions of literature reviews: “to get a sense of what we already know about a particular question or problem, to understand how it has been addressed methodologically, and to figure out where we need to go next with our research” (Norris & Ortega, 2006:5).

In the next section an account of the methodology of the research synthesis is presented. This is followed by a narrative review of empirical findings on both the type of lexical problems L2 writers pose themselves in L2 writing, and the lexical retrieval strategies used in their solution. In the final section, some conclusions at the levels of theory and research are presented.

II. METHODOLOGY OF THE RESEARCH REVIEW

The present research synthesis took as its basis the outcome of the manual and electronic search processes used in another recent research review of L2 writing strategies conducted by the authors (Manchón, Roca de Larios, & Murphy, 2007)¹. Four data sources were used. First, we checked the ERIC electronic data basis. Second, we searched –both manually and electronically- the relevant journals in the field, which included *Annual Review of Applied Linguistics*; *Applied Linguistics*; *Assessing Writing*; *ELT Journal*; *English for Specific Purposes*; *Foreign Language Annals*; *International Journal of Applied Linguistics*; *International Journal of Lexicography*; *The Journal of Second Language Writing*; *Language Learning*; *Language Teaching*; *The Modern Language Journal*; *System*; *TESL-EJ*; *TESL Canada Journal*; *TESOL Quarterly*; *Written Communication*. Third, we consulted previous bibliographies, including those published in the *Journal of Second Language Writing* up to 2006, Silva, Brice, Kapper, Matsuda, and Reichelt (2001), and Silva and Brice (2004). The final data source used was represented by available research syntheses of L2 writing research conducted within the process-oriented paradigm (Krapels 1990; Krings 1994; Manchón 1997,

2001a; Cumming 1998, 2001; McDonough 1999; Roca de Larios, Murphy & Marín 2002; Silva & Matsuda 2002; Silva & Brice 2004).

Given the focus of the present review on both lexical problems and lexical strategies, the search also involved looking into process-oriented empirical research that had not been covered in our previous research review. To this end, all the journals mentioned earlier were electronically searched, and the most important process-oriented studies in the field were manually searched again. The selection of the latter (which also included the recent line of research of goals in academic writing, cf. Cumming, 2006a) was based on the authors' familiarity with this field of enquiry, as well as on the cross-references in the studies reviewed.

The search through all these sources was restricted to empirical studies that focused on individual pen-and-paper writing processes, therefore not covering (i) computer-mediated writing studies; (ii) research on the writing activities that may follow the provision of feedback; (iii) studies of collaborative writing; and (iv) research on written products.

The studies selected were then manually searched in an attempt to locate references to writing problems, lexical problems, and lexical retrieval/search strategies. This process was not guided by an a priori operational definition of two of the key constructs in our research problem (Cooper, 1998, Norris & Ortega, 2006), namely, "problems" and "lexical problems". Rather, we just located references to these constructs in the studies reviewed. Regarding the third crucial concept in our research problem (i.e. "strategies"), we adopted a narrow definition of the construct and operationally defined "strategies" as cognitive operations engaged in while trying to solve lexical problems (see Manchón, Roca de Larios, and Murphy [2007], for a full account of different conceptualizations of strategies in L2 writing research).

III. LEXICAL CONCERNS AND PROBLEMS IN WRITTEN PRODUCTION.

The picture that emerges from the research reviewed is that vocabulary represents an important concern for L2 writers, both as a long-term learning goal in their educational experiences, and also when engaged in actual composing activity. In addition, learners have also reported their perception of the importance attached to vocabulary matters in the external assessment of their own writing (cf. Porte, 1996, 1997; Yang, Baba & Cumming, 2004). The first two issues are further discussed next.

III.1. Vocabulary and long-term learning goals.

A number of recent studies framed in goal theories in educational psychology and activity theory (Cumming, 2006a; Cumming, Bush, & Zhou, 2002; Yang *et al.*, 2004) have looked into the dynamics of the goals guiding the learning experience of a group of international students seeking higher education in Canada. One of the basic premises of this research is that, as writing is a goal-directed activity, “it makes little sense to document strategies for performing tasks like second-language writing or characteristics of the texts that people produce [...] unless they are analyzed in reference to the goals people have to motivate and guide their task performance” (Cumming *et al.*, 2002:193). Therefore, these researchers set out to analyse both students’ and teachers’ goals for the improvement of ESL writing and to do so from their own perspective as a necessary step to understand “how students can actually improve their writing in English and how their instructors can assist them to do so” (Cumming, 2006b:3).

Cumming and his associates gathered a variety of data sources (questionnaires, interviews, stimulated recalls, and samples of the students’ writing) at two time points: during the students’ language experience prior to starting their university studies (stage 1), and then a year later, when fully involved in the university studies of their choice (stage 2). The goals the students in Cumming’s research reported at both times of data collection were related to language, rhetoric or genres, composing processes, ideas and knowledge, affective states, learning and transfer, and identity and self-awareness. Interestingly, the category of language (which included both grammar and vocabulary) was among those that least changed from stage 1 to stage 2 (the others being rhetoric and ideas), and it was a top priority for all students at all times of data collection.

When reporting on their goals related to vocabulary, the participants in this research mentioned their attempts to “enlarge their English vocabulary to fill the gap between what they wanted to say and what they could express in writing” (Yang, 2006:83). The students also reported their perception of the need to enlarge their academic vocabulary in order to succeed in their university studies, as well as to increase their knowledge and use of more advanced, sophisticated vocabulary (Zhou, Bush, Gentil, Eouanzoui, & Cumming, 2006). In some of the studies in this programme of research, the participants even reported that the limitation of their vocabulary was one of the reasons for not being able to maintain the standards of L1 writing when composing in English/or to developing in full their identities as members of their new academic communities (Yang, 2006:89). The idea is clearly expressed in this extract included in Kim, Baba, and Cumming (2006:136):

[1]

Interviewer: Do you think your writing in English is different from your writing in Korean?

Jina: Yeah, of course. Because limited, of limited vocabularies. And even though I write, I write vocabularies or I use right vocabularies or right structure, it can be slightly different from what I meant.

The actions taken by these ESL writers to act on their vocabulary-related goals included (cf. Cumming *et al.*, 2002; Yang, 2006; Yang *et al.*, 2004; Zhou *et al.*, 2006) reading widely (newspapers, magazines, books), watching TV, analytic reading of relevant sources (course-related materials) as well as analytic listening while attending lectures in order to identify new (technical, discipline-specific) vocabulary, memorizing (including mnemonics) and using/practising the new vocabulary in their own writing, and using dictionaries.

In short, vocabulary became a primary goal and operational tool in the students' learning experience. In order to act on these goals they made use of mediating artefacts present in the culture of practice they participated in (general reading as well as reading course-related materials, attending lectures, and using dictionaries) and they also engaged in processes deemed to be conducive to L2 development (mainly noticing and practising. See DeKeyser, 2007; Robinson, 2003; Schmidt, 1990, 1993, 2001).

III.2. Vocabulary issues and the on-line production of writing.

In contrast to the research reviewed in the previous section, we shall now account for the empirical findings concerning L2 writers' attention to vocabulary matters as they actually engage in the act of writing. A few words about this strand of research are in order. Collectively, we are dealing with a group of studies framed in cognitive views of writing whose main aim has been to make visible what is otherwise invisible: the actual process of text construction (see Roca de Larios *et al.*, 2002, for a recent review). This exploration has required the use of introspection methodologies, particularly think-aloud (or concurrent) and retrospective protocols. In the case of concurrent protocols, the participants are instructed to verbalize their thinking while performing the writing task, whereas retrospective protocols require participants to reflect on their composing processes after performing the writing task.

In one of the few studies monographically devoted to lexical problems in writing (Roca de Larios *et al.*, 1996), the researchers collected think-aloud data in order to investigate attention to linguistic (lexical) problems in L1 and L2 writing. As shown in Table 1, the analysis of the data yielded four main types of lexical problems tackled by the 14 Spanish

beginner and intermediate EFL learners who took part in the study. The first two types of problems (P1 and P2) entail accessing the relevant lexical units needed to express one's intended meaning, either to find a language form that can materialize one's thoughts (P1), or an L2 form with which to convey a thought or idea already encoded in one's L1 (P2). The third category in the taxonomy (P3) entails upgrading one's lexical options, whereas P4 problems relate to doubts about linguistic accuracy and semantic coverage.

Given the nature of P2 problems and the attention they have received in theoretical and empirical L2 writing process-oriented research, we shall further elaborate on them.

Type	Description
P1.	The writer has constructed or is in the process of constructing a mental representation (at different degrees of complexity) and has to retrieve elements from long term memory to express it.
P2.	The intended meaning is encoded in the L1 and the writer tries to find a translation equivalent in the L2.
P3.	The writer has an option available that expresses or conveys the already constructed mental representation (or intended meaning) but tries to upgrade it in conceptual or linguistic (stylistic) terms.
P4.	The writer has an option available to express the intended meaning but has doubts as to its correctness or appropriacy (in conceptual or linguistic terms).

Table 1. Lexical problems in L2 writing (after Roca de Larios, Manchón, & Murphy, 1996).

As shown in Table 1, P2 are translation problems and, as such, they must be seen in relation to a widely reported phenomenon in process-oriented L2 writing scholarship: recourse to the L1 while composing in an L2 for the purposes of planning, text-generating and revising, as well as to monitor the writing process (see Manchón, 1997; Manchón *et al.*, 2007, for reviews). For instance, research shows that low proficiency L2 writers frequently resort to their L1 while text *planning*, whereas higher proficiency writers are more likely to generate their texts directly in their L2 (cf. McDonough & McDonough, 2001; Wang, 2003; Wang & Wen, 2002; Whalen & Ménard, 1995). This use of the L1 has been found to be particularly

useful when writing about L1 culture-bound topics (Friedlander, 1990; Lally, 2000; Lay, 1982). The argument is that the search for information stored in memory is aided when the search is carried out in the language of the topic. Lay (1982), for instance, found that her subjects (4 adult Chinese-speaking learners of English) were more prone to generating in their L1 when asked to write about a topic related to their L1 background, with the result that they wrote better essays in terms of ideas, organization and details. In another study of Chinese learners of English, Friedlander (1990) came to very similar conclusions: his participants' planning via their L1 resulted in longer and more detailed plans and drafts, as well as in better products.

However, there is also empirical evidence to suggest that text planning via the L1 is not always an asset in L2 writing, precisely because it may lead to P2 problems. For instance, the participants in Akyel's (1994) research were instructed to engage in abstract text planning in one of two conditions: planning in English (L2) or in Turkish (L1). When asked later about their perceptions of planning via their L1, they expressed their fear of making translation mistakes, in addition to the fear that the translation exercise that comes with L1 planning would take up part of their composition time. Interestingly, this perception was shared by both the higher- and lower-proficiency L2 writers in that research.

Similar to text planning, writers also resort to their L1 while actually *generating text*. In his study of Chinese EFL learners, Qi (1998) notes that L2 writers switch to the language in which ideas can be more quickly, more efficiently or more clearly expressed, and with "the least possible interruption in the process of thought development" (p. 426). Cohen and Brooks-Carson (2001) further argue that this use of the L1 "serves to reduce the load on working memory since instead of going from the concepts to their L2 representation, the L2 writers are first expressing the concepts in the L1 and then translating to the L2" (Cohen & Brooks-Carson, 2001:181).

Some studies have found that the "more the cognitive processing is related to textual output, the less L1 is used" (Wang & Wen, 2002:240). That is, the more the writer is concerned with transforming ideas into language, the more the process is conducted in the language of the text (L2). This tendency, however, is not universal. A telling case is the one reported in Sasaki (2001), in which the researcher reflects on her own literacy experience in English and reports that her L2 professional writing is done through her L1 (Japanese). In her own words:

[...] I have written several papers in English, some of which have been published in professional journals [...] [A]lthough in the end those papers are written in English, all the other matters related to the writing process are conducted in my first language [...], Japanese [...] Through the entire research process I think in Japanese, take notes in Japanese, and write the first rough drafts in Japanese because I can't think thoroughly about any complicated matters in English. It is not until the last stage of the research process, when I put everything together into the form of a paper, that I start to use English. This may not be the most efficient way of writing an English paper [...], but this is the only way I can write in English.

As in the case of text planning, resorting to the L1 during formulation may also lead to P2 problems once the L1 term has to be translated into the L2, as noted in a recent study of Japanese learners of English (Sasaki, 2004) in which the participants reported that, although the L1 may be beneficial for generating content, translating may be less efficacious if time is limited, as extra time is required later to translate the generated content into the L2. This perception concurs with the empirical findings from studies in which recourse to the L1 was experimentally manipulated: positive effects for the use of the L1 have been reported in those studies in which the participants who were asked to write their essays in their L1 and then translate them into the L2 were allowed twice as much time as the participants who were asked to write directly in the L2 (cf. Kobayashi & Rinnert, 1992). In contrast, direct writing has been found to render better results when extra time was not allowed in the translation condition (Cohen & Brooks-Carson, 2001).

IV. LEXICAL RETRIEVAL STRATEGIES

In their attempt to solve the lexical problems they encounter while writing, L2 writers have been reported to use several strategies, among which three stand out: L1 use, backtracking, and use of dictionaries. In addition, reference is also made to postponing lexical problems and returning to the flagged items at a later stage in the writing process (Hall, 1990; McDonough & McDonough, 2001, Matsumoto, 1995), restructuring (Roca de Larios, Murphy & Manchón, 1999), reformulation (Cumming, 1989; Zimmermann, 2000), and rehearsal (Raimes, 1987). Due to space limitation, in what follows we shall focus on the first three strategies mentioned.

IV.1. The use of the L1

Jones and Tetroe (1987) characterized "the use of the first language in second language composing as being principally a matter of vocabulary. Where writers lack second-

language vocabulary, they naturally fall back upon their native language” (pp. 54-55), a contention that has received ample empirical support (cf. Cumming, 1989, 1990; Jones & Tetroe, 1987; Lay, 1988; Manchón, Murphy, & Roca de Larios, 2000; Qi, 1998; Sasaki, 2000, 2004; Smith, 1994; Wang, 2003; Wang & Wen, 2002; Whalen & Ménard, 1995; Wolfersberger, 2003; Woodall, 2002). This research shows that L2 writers deploy various L1-based strategies in the solution of most lexical problems depicted in Figure 1. Thus, they switch to their L1 in order to search for appropriate words or phrases (P1 and P3 in Table 1), as well as to assess and verify their lexical choices (P4), and this applies to writers at all proficiency levels.

IV.1.2. Retrieval of lexical items.

In their attempt to retrieve the lexical elements needed to express their intended meaning, L2 writers make use of various L1-based lexical strategies, some of which involve an a priori mental equation of semantic and lexical categories across languages (Cumming, 1990). Thus, L2 writers (1) reformulate their intended meaning in the L1 as a way of finding the L2 equivalent (Qi, 1998; Smith, 1994); (2) retrieve the L1 term that expresses their intended meaning and concentrate on/repeat it hoping that the L2 term will finally come to mind (Qi, 1998; Smith, 1994; Wang, 2003); (3) think of the L1 term that expresses the intended meaning, paraphrase it, and then translate the paraphrase into the L2 (Zimmermann, 1989); (4) start a search in the L1 (at times involving the generation of a range of synonyms [Wang, 2003]), *evaluate* the option found and if acceptable, finally translate it into the L2 (Cumming, 1990); and (5) “segment their intended meaning into pieces until finding a familiar lexical item” (Wang, 2003:364).

IV.1.2. Assessment of lexical choices.

In addition to resorting to the L1 to access lexical units, different studies have reported various cross-linguistic problem-solving devices used to assess and verify one’s lexical choices (cf. Cumming, 1990; Lay, 1982; Manchón *et al.*, 2000; Qi, 1998; Wang, 2003; Wang & Wen, 2002; Wolfersberger, 2003). More precisely, recourse to the L1 has been reported in connection with the solution of P4 problems in Table 1, i.e. with cases in which L2 writers have an L2 option available to express their intended meaning but may doubt its appropriacy or correctness in terms of meaning or use. In these instances, L2 writers have been reported to retrieve “a list of similar words or phrases in the L2 and to switch to the L1 for assessing and making a choice appropriate to contextual features” (Wang, 2003:363).

Another L1-based problem-solving strategy used in the assessment of one's lexical choices is to backtranslate the problem item. Cumming (1990: 495) described the phenomenon as follows:

If unsure of linguistic (especially lexical) items in the second language, these writers frequently back-translated (from their second language to their mother tongue) to verify their intended sense. The tendency of writers to do such back translation confirms that conceptual relationships were equated, cognitively, across first and second languages.

Similarly, in his study of Japanese learners of English in an intensive English programme in USA, Wolfersberger (2003) reports that his subjects resorted to backtranslations "to verify that the English they used conveyed the ideas they intended" (p.11), a behaviour also observed in Wang's (2003) study in which the participants translated words and phrases from their L2 (English) into their L1 (Chinese) "in order to verify whether their text production in the L2 was in accordance with their intended meaning in their L1" (p. 361). Lay's (1982) writers also resorted to backtranslations in order to verify the connotation of words.

According to Cumming (1990), this assessment of lexical choices via the L1 is further evidence that L2 writers use "standards of mother tongue knowledge as a reliable test of linguistic validity" (Cumming 1990:495) and that in doing so they "proceed from the cognitive principle of assessing unfamiliar knowledge against elements of existing knowledge" (Cumming 1990:495).

IV.2. Backtracking

Backtracking is a writing strategy widely reported in the literature, which involves rescanning the wording of the assignment, one's own pre-writing notes or stretches of the growing text, for various purposes and involving both L1-based and L2-based ways of rescanning (cf. Manchón *et al.*, 2000; Raimés, 1987; Smith, 1994; Wolfersberger, 2003. See Manchón 1997, Manchón *et al.*, 2007 for a review).

While engaged in text generation processes, L2 writers resort to Backtracking as a way of accessing the lexical items needed to express their intended meaning (P1), as vividly exemplified in Wolfersberger (2003:4):

Being unable to think of the word mid-sentence also causes Katsue to reread what she had written, occasionally make revisions, and rehearse words to match the idea. In one section of the protocol, Katsue was in the middle of writing the sentence "However, neither of these apply to my approach". She stopped writing and wondered what word to use

halfway through the sentence. Then she read the sentence and came up with the right word, “apply”. As soon as she had thought of this word, she continued to write her sentence.

The following extracts (unpublished data from Authors) exemplify the use of rescanning one’s own text in order to move forward in text-generating activity and, more precisely, to solve P2 (extract [2]) and P4 (extract [3]) lexical problems¹:

[2] *family is the center until they go to school and it’s obvious parents are* um (6) ay no sé cómo ponerlo *parents are* [...] en español sería un ejemplo a seguir pero es que en inglés [...] *family is the center of their life until they go to school and it’s obvious parents are* ... no bueno lo que sea... y si no lo pongo en español y luego... [...] bueno pongo un asterisco porque tengo que seguir

[*family is the center until they go to school and it’s obvious parents are* um (6) uff I don’t know how to say it *parents are* [...] in Spanish it’d be an example to follow but in English [...] *family is the center of their life until they go to school and it’s obvious parents are* ... well whatever.. or else I’ll put it in Spanish and then... [...] well I’ll put an asterisk because I have to go on].

[3] I cannot agree with the idea of a ¿cómo es en inglés que hay un..? ¿cómo se pondrá eso? *I cannot agree with the idea of a* no sé si es control uncontrolled uncontrolled... que eso no sé si existe .. sí uncontrolled .. um .. Es que no sé cómo poner esto *change students’attitude and of course I cannot agree with the idea of an uncontrolled um uncontrolled* es que no es eso es como que .. *no puedo estar de acuerdo con la idea de una* esta cerrada una .. (5) *I cannot agree with the idea of an uncontrolled* voy a poner education pero no es ésta la idea que quiero poner

[I cannot agree with the idea of a How do you say in English that there is a .? How do you sau that? *I cannot agree with the idea of a* I don’t know if it is control uncontrolled uncontrolled...that I don’t know if it exists.. yes uncontrolled .. um .. The thing is that I don’t know how to say this *change students’attitude and of course I cannot agree with the idea of an uncontrolled um uncontrolled* it’s not that it’s that .. *no puedo estar de acuerdo con la idea de una* this closed a.. (5) *I cannot agree with*

¹ Notation: Segments in italics represent rescanning. Underlined segments correspond to the text actually written. The remaining text comprises other verbalizations. Numbers in brackets represent the duration of pauses in seconds.

the idea of an uncontrolled I'm going to say education but this is not the idea I want to write]

It is worth mentioning that in excerpt [3] Backtracking is implemented both via the L2 and then via the L1 (“I cannot agree with the idea of a”/ “no puedo estar de acuerdo con la idea de una”), one more indication of the important role that the L1 plays in the process of L2 writing (see Manchón, Murphy, & Roca de Larios de Larios, 2000, for L1-based and L2-based backtracking behaviour).

In addition to being used during formulation, Backtracking is also used during revision processes in order to solve P3 lexical problems, as exemplified in extracts [4] and [5] (unpublished data from Author):

[4] The issue under consideration (9) no *the issue under consideration* no *the issue* considering this ... essay (6) no I dont like don't include the word essay (4) *the issue the issue* (9) *the issue* concerning [...] let's see the issue under consideration in this piece of writing let's see if it works (1) so *the issue under consideration in this piece of writing*.

[5] Different opinions can be gathered from different people I don't like this repetition see if I can find something better *different opinions can be gathered* when asking no I like from *different opinions can be gathered from different people* okay I have to leave it see if I can find something better *different opinions can be gathered from different people* (3).

IV.3. Dictionary use

Scant attention has been paid in L2 writing process-oriented research to when, how, and why L2 writers make use of dictionaries or which dictionaries they use, which is not surprising given that most L2 writers in the research reviewed were not allowed to use dictionaries while composing their L2 texts (although in some cases they voiced their wish to have access to one, cf. Cumming, 1990; Swain & Lapkin, 1995). However, this is a methodological decision that can be easily justified if we bear in mind that most L2 writing process-oriented research is based on time-compressed writing, and dictionary use is time-consuming (see Christianson, 1997).

The lack of attention to dictionary use in writing contrasts with the attention it has received in reading and vocabulary strategy research (see Nyikos & Fan [2007] for a recent

review). In fact, we have only located two writing vocabulary studies, one devoted to vocabulary retention (Bruton, 2007) and another one to dictionary look-up strategies (Christianson, 1997).

Reference to dictionary use in the solution of lexical problems is made, however, in some process-oriented empirical studies. Thus, in her study of error correction strategies, Kubota (2001) affirms that her participants corrected 48% of vocabulary errors by using dictionaries. Wolfersberger (2003) reports that when the participants in his research used backtranslations to verify meaning (see IV.2. above), they did so by “using an English to Japanese dictionary or asking the researcher for the Japanese equivalent” (p. 11). This is understandable when we take into account that over 75% of L2 students use bilingual dictionaries (Atkins & Knowels, 1990, quoted in Rundell, 1999). Without entering into the debate as to the advantages and disadvantages of monolingual or bilingual dictionaries (see Christianson, 1997), it could be speculated that bilingual dictionaries may be more useful in the solution of P2 problems, whereas resorting to monolingual dictionaries would make more sense in the solution of P3 and P4 lexical problems because, as Bruton (2007) rightly argues, “monolingual L2 dictionaries are virtually useless for locating unknown target language items in the productive L1-L2 direction”, which would be the case with P2 problems. However, as noted by Rundell (1999), “bilingual dictionaries are perceived as easy to use, yet often fail to provide the range and subtlety of information needed for effective production”, as would be the case with the lexical issues subsumed under the P3 and P4 categories.

Another study in which reference is made to dictionary use is McDonough and McDonough (2001). In this study the researchers examined the writing processes of an adult learner of Modern Greek (one of the authors) over a period of 5 months on the basis of the participant’s tape recorded think-aloud protocols while performing homework tasks. One of the strategies employed by this learner was the use of reference books and, among them, dictionaries, which were used both to check spelling and appropriacy of meaning (p. 237). It was also observed that during the course of the investigation the participant’s dictionary use behaviour changed quantitatively and qualitatively. Thus, the time spent on detailed dictionary use decreased over the 5 months of the research. In addition, the student could not get started on writing unless she had access to two dictionaries (a pocket bilingual and a larger Greek-English dictionary), in addition to other reference materials (such as a textbook, a book of verb conjugations, or verb form lists), although this behaviour eventually became “more relaxed”. These resourcing strategies are vividly explained by the learner herself in excerpt [6] with respect to vocabulary matters (McDonough & McDonough, 201:243):

[6] Since I frequently inveigh, with great frustration, against my poor memory for vocabulary, it is as if these sources provide a reassuring generalised memory bank where the specifics are lacking, i.e. I don't remember it but I know exactly where I can find it

V. SUMMARY AND CONCLUSIONS

The body of research reviewed in this paper confirms the importance of lexical retrieval processes in second language composing. We have learned that L2 writers tackle a variety of lexical problems whose solution requires the deployment of various lexical search strategies.

Perhaps one of the most conspicuous findings of the literature search conducted is the important role that the L1 plays in the solution of lexical problems. In fact, the empirical evidence reported in this paper comes to reinforce the idea that L2 writing is a “bilingual event” (Wang & Wen, 2002:239). As far as lexical retrieval processes and strategies are concerned, this bilingual experience entails tackling translation problems derived from planning and generating via the L1 (P2 problems). However, the association between the use of the L1 and the word “problem” should not be interpreted as pointing to a negative influence of the native language in the process of L2 composing. Quite the contrary: the empirical evidence reviewed in the preceding sections shows that, as noted by Qi (1998), “language switching facilitates rather than inhibits L2 composing processes” (p. 429), at least as far as solving lexical problems is concerned. We have seen that L2 writers find it helpful to resort to their native language both for accessing lexis and for assessing and verifying their lexical choices.

This use of the native language in L2 composing should be linked to two issues of contention in second language acquisition (SLA) research. One is the whole debate on the transfer phenomenon in SLA (see Manchón, 2001b; Odlin, 2003 for two recent reviews). More precisely, the deployment of L1-based lexical search strategies should be linked to the phenomenon of “strategic transfer”, defined by Faerch and Kasper (1986) as a problem-solving procedure intentionally used by L2 users to overcome problems in L2 learning and use. It is also worth adding that, following Cumming (1990), in many of the instances of strategy transfer reported in the research reviewed, L2 learners employed their L1 as the yardstick against which to judge their lexical choices. This use of the L1 comes to support the view that L2 writers's should be seen as possessing a “psycholinguistically distinct form of ‘multicompetence’” (Ortega & Carson, In press) that allows them to switch among the various

languages that form their linguistic repertoire (for instance, to assess and verify lexical choices) and to use their accumulated explicit or implicit language knowledge in their attempt to find the best possible way of achieving a match between communicative intentions and linguistic expressions.

The second area of SLA in which the research reported is relevant is the long-standing debate as to the nature of the bilingual mental lexicon and, more precisely, the debate as to the integration or separation of the L2 and L1 mental lexicons. In his recent review on the issue, Singleton (2007) argues that “at some level, and in some sense, there must be separation between the lexicons associated with different languages known to the individual” (p. 3). He also argues that “there is a dimension to the process of lexical activation that has to do with attributes and perceptions at the language level rather than at the level of lexical items; this in turn implies a degree of psychological differentiation and therefore separation between different languages and their associated lexicons (Singleton, 2007:13). Albeit tentatively, we would suggest that the strand of research reported in this article could be taken as further evidence against a purely unitary view of multilingual lexical knowledge.

Another conclusion to be drawn from the research reviewed is the scant attention paid to the ways writers make use of dictionaries while composing in their L2. In addition to the light that this research could shed on the debate referred to earlier about the usefulness of monolingual or bilingual dictionaries, it seems to us that it would be worth expanding the empirical inquiry in this area in connection with another topic that has recently attracted considerable attention in SLA studies: the role of output practice in L2 development (see Manchón & Roca de Larios, 2007b; Muranoi, 2007, for two recent accounts). Basically, the argument is that the production of output can contribute to language acquisition given that the activity of producing language entails the activation of certain processes that are thought to be conducive to language development, in particular the processes of attention, noticing, hypothesis testing, cognitive comparison, and practice. More precisely, it has been suggested that the beneficial effects of output practice could be related to both the increase in language resources, and/or the development of control over the use of available resources. It would seem to us that, if, as various authors have suggested (cf. Harklau, 2002; Manchón & Roca de Larios, 2007b), in many L2 instructional contexts (particularly foreign language settings) writers “write to learn” (rather than “learn to write”), it is pertinent to investigate further whether or not the use of dictionaries while writing can help to increase L2 learners’ lexical knowledge and/or their control over the use of their lexical resources, and, if so, why, how, when and for whom. It would also make theoretical and pedagogical sense to delve further

into the language learning potential of engagement with the various lexical problems (P1, P2, P3 and P4) that L2 writers have been reported to face in L2 writing. Interestingly, the empirical research on the role of output practice in promoting language development (see reviews in Muranoi, 2007; Shehadeh, 2002) has paid scant attention to lexical issues as it has mainly focused on grammar. In addition, as uncovered in recent research (Snellings, Van Gelderen & De Gloper, 2004), even receptively known lexis will not be used in writing unless it has received focused and repeated practice, a finding with important classroom implications. As is also relevant from a pedagogical perspective the empirical evidence concerning how lexical retrieval processes can be specifically addressed and improved (Snellings, Van Gelderen, & De Gloper, 2002).

To conclude, the findings from the studies reviewed above shed light on both the complexity and the bilingual nature of lexical access and retrieval while composing a text in a second language, a phenomenon which is, in turn, linked to important issues in SLA and writing research, particularly the phenomena of transfer in second language use, the nature of the multilingual's mental lexicon, and the language learning potential of output practice. This paper has provided a summary of the main findings of disciplinary inquiry in this field and has indicated areas in which there is scope for further research.

Acknowledgments

We are very grateful to the two reviewers who read our article for their insightful comments. The research reported in this article is part of a wider programme of research into second language learning and language use strategies financed by the Spanish Ministry of Education (Research Grant n° SE2005-04266).

NOTE

1. The research synthesis referred to was intended as a thorough review of empirical research on writing strategies. It did not focus specifically on lexical search strategies.

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