

The Role of Written Corrective Feedback in Promoting Language Development: An Overview

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Abstract The provision of corrective feedback in instructed second language acquisition has always remained a highly controversial issue, both with respect to spoken and written foreign language production. When it comes to writing, this is evident in the fact that while there are specialists such as Truscott (1996, 1999, 2004), who call into question the effectiveness of this kind of pedagogic intervention, others (e.g. Chandler 2003; Hyland and Hyland 2006; Sheen 2010a, b, c; Ferris 2012) provide convincing evidence that it can have a positive contribution not only to foreign language development but also to learners' motivation. The present paper is intended as an overview of research into the effects of written error correction on the acquisition of different aspects of the target language system, an area that has been explored to some extent, but is clearly in need of further empirical investigation. In accordance with the model proposed by Ellis (2010), it focuses both on the findings of studies exploring overall effects of written error correction, the effectiveness of specific feedback options, the mediating influence of individual, contextual as well as linguistic variables, and the impact of learners' behavioral, cognitive and affective response. It also considers future directions of research into the role of written feedback in language development as well as the methodological challenges that such empirical investigations inevitably face.

1 Introduction

When discussing the conditions indispensable for successful acquisition of second and foreign languages, Gass (2003) stresses the need for the provision of positive evidence, negative evidence as well as opportunities for output production.

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As regards the first of these, it “(...) refers to the input and basically comprises a set of well-formed sentences to which learners are exposed” (2003: 225), and it takes the form of authentic or modified samples of the target language. The second is related to “(...) the type of information that is provided to learners concerning the incorrectness of an utterance” (2003: 225), and it may vary with respect to its explicitness, with direct rule explanation constituting one end of the continuum and increased exposure to instances of the targeted structure in meaningful spoken or written texts (i.e. input flooding) forming the other. The third is connected with performance in the target language (TL), preferably of the more spontaneous type, which can occur in the spoken and written mode, requires syntactic processing, and constitutes a crucial means of testing hypotheses and fostering automaticity (cf. Swain 2005). Even though the key role of positive evidence cannot be denied as “[o]ne must have exposure to the set of grammatical sentences for learning to take place” (Gass 2003: 226), negative evidence is now also regarded as facilitative or even indispensable for language development (cf. Pawlak 2006; Ellis 2008; Larsen-Freeman 2010; Nassaji and Fotos 2011). An important way in which such information can be conveyed is the provision of oral or written corrective feedback (CF), which is only possible when learners engage in target language production of one kind or another.

The focus of the present paper is on the contribution of written corrective feedback and in particular on its effect on the acquisition of specific linguistic features, a line of inquiry that has been pursued vigorously in recent years but is clearly in need of much further empirical investigation, specifically such that would be conducted with greater methodological rigor. At the outset, the definition, role and scope of corrective feedback will be presented, opposing views on its contribution will be outlined, and theoretical support for its provision will be discussed. This will be followed by the comparison of the main features of oral and written error correction as well as the consideration of the pedagogical concerns that are involved in responding to errors in learners’ written output. Subsequently, a framework for research into written CF will be presented, methodological issues related to such research will be tackled, and the key findings of studies in this field will briefly be presented, both with respect to the effectiveness of different techniques of error correction, the influence of mediating variables and learners’ response to the corrective information with which they are supplied. The paper closes with an evaluation of the existing research into the effects of written feedback on the acquisition of the TL system, a consideration of the future directions of such research, and a discussion of the methodological challenges that these empirical investigations must grapple with.

2 Corrective Feedback in Instructed Second Language Acquisition

In the words of Sheen and Ellis (2011: 593), “[c]orrective feedback refers to the feedback that learners receive on the linguistic errors they make in their oral or

written production in a second language (L2)". Such pedagogic intervention can be employed to address problems in the use of different target language subsystems, such as grammar, vocabulary, pronunciation (only oral CF), spelling (only written CF), or pragmatics, but most of the studies carried out so far have explored the first of these areas. What should also be emphasized is that corrective techniques can be drawn on to deal with a whole gamut of errors committed by learners, both those that are not immediately relevant to such a focus but are perhaps particularly serious or irritating to the teacher, and those that are involved in the use of TL forms that are currently the focus of instruction. In the latter case, they are applied in order to aid the accomplishment of specific pedagogic goals pursued in a lesson or a series of such lessons, thus becoming an integral part of form-focused instruction (FFI). While both approaches have an important role to play in foreign language pedagogy, the second appears to be more beneficial on theoretical, empirical and practical grounds since, as will be illustrated below, theoretical support for the value of CF derives in the main from theories and hypotheses seeking to account for the role of FFI, the vast majority of studies of CF have been inspired by the need to identify the most efficacious ways of teaching TL forms, and drawing students' attention to inaccuracies in the use of linguistic features taught in a given lesson is likely to be more efficacious than reacting to various errors in a random way. As Pawlak (2012: 52) notes, "[g]iven the ubiquity of error correction in the classroom and the importance attached to it by theoreticians, researchers, methodologists, teachers and learners, there is a clear need to stop considering it as an isolated phenomenon that just happens to be an inherent component of language teaching and to place it within a broader framework with a view to accounting for its contribution to the acquisition of the linguistic features which are the focus of pedagogical intervention".

The views on the role of error correction in foreign language pedagogy have undergone a considerable evolution over the last fifty years, which has been reflective of the dominant views on the nature of first and second language acquisition (cf. Roberts and Griffiths 2008). Thus, while behaviorists emphasized the need to avoid errors at any cost and to treat them as soon as they appeared, innatists were of the opinion that negative evidence was superfluous in view of the fact that exposure to samples of the TL was seen as sufficient to trigger internal processing mechanisms such as Universal Grammar, a position that found its reflection in Interlanguage Theory (Selinker 1972), Creative Construction Theory (Burt and Dulay 1980) or Krashen's (1981, 1982) Monitor Model, leading to the emergence of non-interventionist approaches to language pedagogy. The pendulum swung back once again with the revival of interest in form-focused instruction and the advent of interactionist theories, which view the provision of corrective feedback as an important tool in promoting language development and will be briefly discussed later in the present section. It is also warranted to take a closer look at the arguments for and against error correction, commonly advanced by its proponents and detractors, respectively. As for the former, Krashen (1982: 119) famously commented that "(...) even under the best of conditions, with the most learning-oriented students, (teacher corrections will not produce results that will

live up to the expectations of many instructors”. Such a stance is closely related to the assumption that error treatment is unlikely to affect learners’ implicit L2 knowledge (cf. Schwartz 1993), the existence of orders and sequences of acquisition that have been shown to be impervious to instruction (cf. Larsen-Freeman and Long 1991), the outcomes of research into first language acquisition and naturalistic discourse (cf. Majer 2003), affective concerns, as well as purely practical considerations related to the inconsistency and limited effectiveness of CF (cf. Truscott 1999, 2004). When it comes to the latter, it is fitting to quote Chaudron (1988: 133), who argued that “(...) from the learners’ point of view (...) the use of feedback may constitute the most potent source of improvement in (...) target language development”, as well as Larsen-Freeman (2003: 126), who pointed out that “(...) feedback on learners’ performance in an instructional environment presents an opportunity for learning to take place. An error potentially represents a teachable moment”. Such opinions appear to be fully justified in the light of copious empirical evidence that form-focused instruction, including different forms of oral and written corrective feedback, works for the acquisition of different aspects of target language grammar and its positive effects are retained over time (Ellis 2001; Norris and Ortega 2001; Pawlak 2006; Larsen-Freeman 2010; Nassaji and Fotos 2011; Spada 2011). In addition, it has been argued that the provision of feedback may speed up movement through developmental sequences, erroneous utterances can serve as input for learners (cf. Lightbown 1998), correction may be necessary to highlight some L1/L2 contrasts (cf. White 1991), such pedagogic intervention may be indispensable in contexts which offer little in- and out-of-class access to the target language, and it is often in line with students’ expectations (cf. Pawlak 2012).

The case for the beneficial role of feedback, whether it is provided in the oral or written mode, can also be made on the basis of a number of influential theories and hypotheses, both psycholinguistic and sociolinguistic in nature, that have considerably affected research in the field of second language acquisition (SLA) in recent years. One such theoretical position is the Noticing Hypothesis (Schmidt 1990, 2001), according to which language learning cannot take place without a certain degree of attention to linguistic features in the input to which the learner is exposed, as this allows him or her to make cognitive comparisons, and notice gaps and holes in the interlanguage system, processes which are indispensable for the restructuring of TL knowledge. Clearly, the provision of CF, irrespective of the form it takes, is one of the main ways in which such attention can be generated. This stance is adopted by the updated version of the Interaction Hypothesis (Long 1996) and the Output Hypothesis (Swain 1995, 2005), both of which emphasize the pivotal importance of reactive negative evidence as a way of getting learners to identify mismatches between their output and the target language norm, the key difference between them lying in the fact that the former favors input-providing CF, as exemplified by the use of recasts (i.e. corrective reformulations of an erroneous utterance or sentence that preserves its intended meaning), and the latter sets store by output-prompting CF, as implemented by different types of prompts (i.e. corrective moves intended to trigger self-repair). The positive contribution of

corrective feedback is also posited by Skill-Learning Theory (DeKeyser 1998, 2001), according to which such intervention, be it oral or written, assists the conversion of declarative knowledge into procedural knowledge, and connectionist theories (Ellis 2005), where error correction is believed to foster associative learning by, for example, sensitizing learners to the occurrence of specific linguistic features in the input, stimulating the noticing of non-salient and semantically redundant items, or ensuring the fine-tuning of the interlanguage system. Support for error correction also stems from the Delayed-Effects Hypothesis (Lightbown 1998), which is based on the assumption that, although not immediately visible, the benefits of such intervention can be reaped at a later time thanks to the priming effect (cf. Doughty 2001), and the Counterbalance Hypothesis (Lyster and Mori 2006), which claims that different types of CF may come in handy depending on the overall pedagogic orientation of language instruction (i.e. communicative or form-focused). Finally, the positive role of feedback is recognized by Relevance Theory (Nizgorodcew 2007), where it is regarded as a mechanism for ensuring optimal relevance of information about the formal aspects of the TL, and Sociocultural Theory (Lantolf and Thorne 2007), which stipulates that appropriately pitched correction, falling within a learner's zone of proximal development, can contribute to the processes of internalization and self-regulation.

3 Pedagogical Concerns in Written Corrective Feedback

Before taking a closer look at the pedagogical choices involved in responding to inaccuracies in learners' writing, several comments are in order on the similarities and differences between oral and written corrective feedback. As can be seen from Table 1, compiled on the basis of the discussion of relevant issues included in Pawlak (2006), Sheen (2010b), Sheen and Ellis (2011), this comparison can be conducted with respect to such key areas as the salience of the corrective force of the response to inaccurate output, the availability of feedback, the timing, type, explicitness, character and complexity of the correction, and the contribution of CF to the development of explicit and implicit knowledge. In the first place, while, depending on the corrective technique used (e.g. a recast or some kind of meta-linguistic feedback), oral CF may not always be interpreted as negative evidence, such problems usually do not occur in the case of written CF, which is conspicuous to the learner by its very presence in a piece of writing. This issue is closely tied to the explicitness of the intervention, since, due to limited attentional resources, oral correction can be more explicit (overt) or implicit (covert), thus resulting in different levels of learners' awareness that they are being provided with corrective information, while written correction can only be explicit as the intervention is evident and permanent. Other differences are related to the fact that oral CF is typically available to other students in the classroom whereas written CF is limited to errors committed by a particular learner, the former can be both immediate and delayed while the latter can only be delayed, perhaps with the exception of

Table 1 Key differences between oral and written corrective feedback (based on Pawlak 2006; Sheen 2010b; Sheen and Ellis 2011)

Oral corrective feedback	Written corrective feedback
Corrective force may not always be clear	Corrective force is usually clear
The feedback is publically available	Feedback only on one's own errors
The feedback is provided online and offline (i.e. immediate and delayed)	The feedback is provided only offline (i.e. it is delayed)
Relatively straightforward focus (i.e. target language form)	Considerable complexity of focus (i.e. many aspects of second language writing)
Both input-providing (e.g. recast) or output-inducing (e.g. clarification request) corrective techniques are available	Both input-providing (direct correction) or output-inducing (indirect correction) corrective techniques are available
The feedback can be explicit (overt) as well as implicit (covert)	The feedback can only be explicit (overt) as the intervention is evident
The correction can be conducted by the teacher, the learner who erred, or a peer	The correction can be conducted by the teacher, the learner who erred, or a peer
Metalinguistic information possible	Metalinguistic information possible
Conversational or didactic	Mostly didactic
Possible direct impact on implicit, procedural knowledge	Only explicit, declarative knowledge affected in the main

synchronous text-based computer-mediated communication, and the focus of oral correction is much more straightforward when compared with written correction, which is often directed not only at TL forms, but also many other aspects of L2 writing. Additionally, oral corrective feedback can be both conversational and didactic, which means that it can be employed to respond to genuine communication breakdowns or with the purpose of drawing learners' attention to an erroneously used linguistic feature, and written corrective feedback mainly serves the second of these functions since, due to its timing, it is of little relevance to ensuring a smoothness flow of interaction. From a pedagogic perspective, perhaps the most crucial difference between CF supplied in the two modes is that while oral error correction, particularly when it occurs during communicative activities and lead to the processes of cognitive comparison and noticing the gap, can possibly trigger the development of implicit, procedural knowledge (i.e. such that can be accessed in real-time processing and underlies spontaneous communication), the contribution of written correction is confined to stimulating the growth of explicit, declarative knowledge (i.e. such that is conscious, rule-based and available only when there is sufficient time). As regards the similarities between oral and written CF, both of them can be input-providing and output-inducing, depending on whether the correct form is provided or self-repair is required, they can rely on metalinguistic information to a greater or lesser extent, and their source can be the teacher, the learner who has erred or another student.

Worth mentioning at this juncture is the study undertaken by Sheen (2010b) which is, to the best knowledge of the present author, the only attempt to date to explore the contributions of the mode of error correction, on the acquisition of a specific target language feature. More precisely, the research project sought to

compare the differences in the impact of oral recasts and direct written correction, as well as oral and written metalinguistic CF on the acquisition of English articles. The 177 participants, who were university-level ESL students, formed one control group and four treatment groups which differed with respect to the CF strategy used in response to errors when retelling a story in groups of three or in written summaries of this story, namely oral recasts, oral metalinguistic correction, written direct correction, and written metalinguistic correction. The data on the application of the targeted feature were collected on pretests, immediate and delayed (by four weeks) posttests, which involved a speeded dictation test, a writing test, and an error correction test, with the subjects being requested to fill out an exit questionnaire immediately after the last posttest which aimed to tap their awareness of the focus on the corrective interventions and the tests they had completed. It was found that: (1) written direct correction proved to be superior to oral recasts, which is related to the students' failure to notice the corrective force of recasts, (2) oral metalinguistic correction and written metalinguistic correction proved to be equally effective in promoting learning, which seems to suggest that the level of explicitness is more important than the timing of correction, and (3) irrespective of the medium, CF accompanied by metalinguistic information generated higher levels of awareness than feedback that did not contain information of this kind. On the basis of these findings, Sheen concludes that "(...) it is not so much the medium of the CF as the degree of its explicitness or the extent of information provided that is important" (2010b: 228), a comment which is a cautionary note against making too much of the differences listed in Table 1. In fact, as has been demonstrated above and will be shown in the remainder of this paper, there are many issues that are common to the study of oral and written feedback, such as the overall contribution of this type of intervention to second language development, the effectiveness of different types of corrective techniques, the role of individual, linguistic and contextual variables, the nature of learner response to the corrective information, as well as the choices made with respect to research methodology.

The common ground between oral and written corrective feedback is also evident in the fact that the decisions that need to be made in both cases are by and large the same and reflect the questions posed by Hendrickson (1978) well over three decades ago. They are as follows:

- *whether learner errors should be corrected*—on a more general level, it is reflective of the debate between Truscott (1999, 2007), Ferris (1999, 2004) as to the effect of CF on acquisition and subsequent writing, but, more narrowly, it is related to the decision as to whether a particular error in a particular piece of writing should be treated or left uncorrected because the learner is not familiar with the structure or it is not relevant to the pedagogic goals of a given lesson;
- *when learner errors should be corrected*—although, with the exception of synchronous computer-mediated communication, written CF is almost always provided offline (i.e. it is delayed), the issue of timing becomes relevant in the case of process writing as errors can be treated at different stages of drafting and redrafting (cf. McGarrell and Verbeem 2007);

- *which learner errors should be corrected*—there is a clear preference for *selective CF* rather than responding to every single error; although it is possible to propose a number of criteria that could inform the decision which inaccuracies should be reacted to (e.g. errors vs. mistakes, global vs. local errors, simple vs. complex structures), particularly promising appears to be *focused error correction* (cf. Sheen 2010c), in which a specific category of errors, such as articles, the past simple tense or passive voice, is the target of pedagogic intervention; many studies have also drawn a distinction between *treatable* and *untreatable* errors (cf. Ferris 1999), or such that occur in a pattern and can be easily related to specific rules (e.g. subject-verb-agreement, articles, pronouns), and such that cannot be accounted for in a straightforward way and their occurrence is idiosyncratic (e.g. prepositions, word choice);
- *how should learner errors be corrected*—a distinction can be made here between *direct corrective feedback*, in which case the correct version is provided by the teacher, with or without metalinguistic information (e.g. crossing out the unnecessary element, inserting the missing element, writing down the correct form above or near the error), or an entire sentence or paragraph is reformulated, and *indirect corrective feedback*, where the error is highlighted for the learner and this indication is often accompanied by metalinguistic information as well (e.g. underlining, circling, highlighting, indicating inaccuracies in the margin, introducing a correction code) (Harmer 2007; Bitchener and Knoch 2010);
- *who should correct learner errors*—although *teacher correction* is the most common in the majority of general foreign language classes, in many cases it is possible to increase learner involvement through reliance on *self-correction* or *peer-correction*, particularly when entire courses are dedicated to developing writing skills and the process approach to writing can be implemented; what should be taken into account, however, is the fact that learners cannot be expected to self-repair errors on TL features they are unfamiliar with and weaker ones might even experience difficulty in fixing problems in the use of forms that are currently focus of the instructional agenda; also of great relevance here is students' marked preference for being corrected by the teacher rather than other learners (cf. Hyland and Hyland 2006).

Clearly, as is the case with oral corrective feedback, all of these decisions are intertwined in intricate ways and the availability of some options hinges upon the previous decisions made, a good case in point being self-correction, which can only be attempted when the teacher falls back upon indirect corrective techniques.

4 Investigating Written Corrective Feedback

As can be seen from a framework for investigating corrective feedback, both oral and written, put forward by Ellis (2010) and presented diagrammatically in Fig. 1,

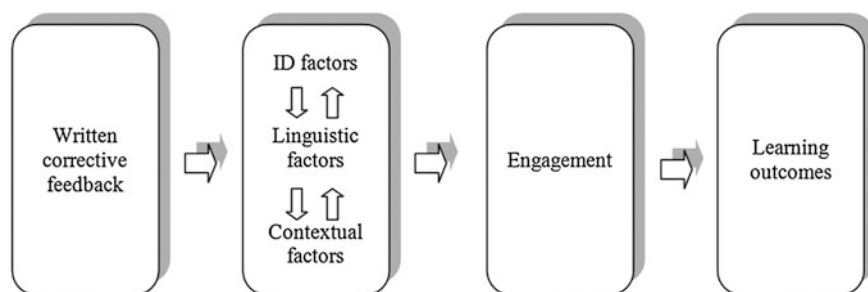


Fig. 1 A revised framework for investigating corrective feedback (adapted from Ellis 2010: 336)

four aspects of error correction can become the object of empirical inquiry, with the crucial caveat that interfaces between them are also of considerable interest for researchers. The first of these is connected with the *effectiveness of different written CF techniques*, with researchers channeling most of their energies into comparing the contributions of different types of *direct* and *indirect options* as well as various constellations thereof (see the discussion in the previous section). Whatever form the response in learners' written output may take, the effects of this response are bound to be impacted by a wide range of *moderating variables*, which can be reflective of *individual differences between learners* (e.g. age, aptitude, attitudes, anxiety, motivation, learning style), *linguistic factors* (e.g. developmental readiness, complexity, the extent to which a particular TL feature is treatable), and *contextual factors* (e.g. the specificity of the instructional context, the presence of previous instruction, the stage in the instructional cycle). Equally significant is *learners' engagement* with the feedback they are provided with, the third component in the framework, which can be investigated with respect to the *behavioral response* (i.e. self-repair of the errors indicated by the teacher), the *cognitive response* (i.e. interpreting the teacher's feedback in the correct way or understanding the nature of the correction), and the *affective response* (i.e. learners' attitudes towards being corrected or the type of written CF employed). Finally, studies of written corrective feedback also have to address the critical issue of how to measure learning outcomes in order to offer insights into the contribution of different types of such pedagogic intervention. Even though tapping learners' implicit knowledge may not be of primary concern in the light of the fact that written CF is expected to mainly influence explicit knowledge, it is of paramount importance to go beyond looking only into immediate revisions of the same texts and to determine improvement in students' ability to apply what they have learnt to new pieces of writing, composed some time after the provision of feedback, which, in effect, boils down to reliance on pretest–posttest–delayed posttest experimental designs. The following subsections provide an overview of key issues in the methodology of research into written CF and outline the most important findings of empirical investigations of this kind.

4.1 Methodology of Research into Written Corrective Feedback

When discussing methodological issues involved in empirical investigations of written CF, a key distinction has to be made between *L2 writing research* and *second language acquisition research*, as they pursue quite disparate goals, which has a bearing on the ways in which they are designed and conducted. As Sheen (2010b: 204) explains, “(...) whereas SLA researchers have been primarily concerned with CF in relation to how it affects learning processes and outcomes, such as noticing and changes in linguistic competence, L2 writing researchers have been primarily concerned with how CF can improve writing performance”. As a consequence, the former, who are mainly preoccupied with demonstrating that corrective feedback can aid language learning in general language classrooms, opt for experimental or quasi-experimental designs which are currently the norm in research in oral CF (e.g. Sheen 2007). The latter, in turn, are mainly preoccupied with the realities of composition classes, and are fully content with showing that feedback on different aspects of writing has the immediate effect of eliminating the inaccuracies from the original text (e.g. Ashwell 2000), an approach similar to that adopted in descriptive research on oral CF, where success is measured in terms of uptake and repair (cf. Ferris 2010; Pawlak 2012). Such differences notwithstanding, it has to be admitted that the methodology of research into written error correction has undergone an evolution that is reminiscent in many respects of the transformation that has affected empirical investigations of the effects of oral corrective feedback. This is evident in a gradual shift of emphasis from examining learners’ ability to introduce modifications into their texts in response to CF on a variety of features, both linguistic, content-related and organizational in nature, to exploring the impact of error correction, frequently confined to one or a clearly defined set of items (i.e. focused), on their ability to compose new texts, also some time after the errors are treated.

As is the case with oral error correction, there are different approaches to the study of written corrective feedback, which are reflective of the specific goals that researchers wish to accomplish. When the goal is to tap into teachers’ and students’ perceptions of the provision of CF (e.g. its presence, timing, source, or the ways in which it is supplied), it is only natural to rely upon different types of *surveys* generating *self-report data*, which can take the form of *more or less structured questionnaires* or *interviews* (e.g. Hedgcock and Lefkowitz 1994; Lee 2008). In cases, in which the aim is to determine the effectiveness of written error correction, both in general terms and with respect to specific CF techniques, researchers can carry out (cf. Hyland and Hyland 2006; Pawlak 2012):

- *revision studies*, which focus upon students’ ability to edit their pieces of writing on receiving expert CF (e.g. Ferris and Roberts 2001); the main drawback of research of this kind is that it fails to provide conclusive evidence for the mastery of the targeted features over time;

- *experimental studies*, which seek to appraise the value of different types of written CF; while *early experimental research* did so without the inclusion of a true control group or delayed posttests and focused primarily on the broad distinction between direct and indirect correction (e.g. Landale 1982; Semke 1984), *recent experimental studies* are carefully designed, include a control group, examine the durability of treatment gains, and typically look into the effects of various subtypes of the direct and indirect CF options (e.g. Bitchener et al. 2005);
- *reformulation studies*, in which students first compose a text, individually or in pairs, the piece of writing is revised by a proficient language user, who makes sure that it complies with native speaker norms but at the same time preserves the original ideas expressed by its authors, which is followed by the discussion of the changes among the learners and subsequent revisions of the first draft (e.g. Sachs and Polio 2007).

There is also a possibility of complementing research aimed to establish the value of different CF types with self-report data, thereby gaining insights into how learners perceive different corrective techniques and determining the extent to which they fit in with their preferences, a good example being the study by Lee (2008), who augmented the analysis of revisions with the perceptions of the participants. When it comes to the impact of mediating variables on the effects of different types of written CF, it is necessary to opt for much more complex research designs, draw upon instruments needed to obtain data about a factor under study, and often employ more advanced statistical procedures or some kind of combination of quantitative and qualitative methodologies, which perhaps accounts for the paucity of studies in this area. One example of such an investigation is the study conducted by Sheen (2007), who explored the interfaces between the efficacy of written corrective feedback, with or without metalinguistic information, and language aptitude in the acquisition of English articles. Learner engagement with written error correction has mostly been investigated in terms of the behavioral response (i.e. the presence or absence of a revision) and the cognitive response (e.g. the occurrence of noticing and the depth of awareness), and this has mainly been done within the framework of reformulation studies, such as that carried out by Sachs and Polio (2007). Similarly to oral CF, there is a marked paucity of studies examining the affective response, a notable exception being the research project conducted by Storch and Wigglesworth (2010), who compared the contribution of direct and indirect CF, but at the same time adopted the analytical apparatus of Sociolinguistic Theory (Lantolf and Thorne 2007) to look into interactions between learning outcomes, the nature of engagement with correction, and students' beliefs and goals, thereby forging a crucial link between products, processes and learner-related factors.

4.2 Main Findings of Research into Written Corrective Feedback

Since a detailed discussion of the findings of research into written corrective feedback cannot be accommodated within the confines of this paper, the present section only highlights the most important tendencies identified by researchers, focusing on the perceptions of this type of pedagogic intervention, the overall effectiveness of written CF, the value of particular corrective techniques, the influence of mediating variables, and learner engagement with the corrective information. As regards teachers' and learners' views on the need for written error correction, most of the available research indicates that students want to have inaccuracies in their writing corrected and they may even manifest frustration when they are deprived of such assistance. This is well evident, for instance, in the studies conducted by Leki (1991), which showed that the majority of learners display a strong preference for teacher correction, and Hedgcock and Lefkowitz (1994), who identified similar beliefs among learners of English as both a foreign and second language, an additional finding being that the former preferred to be corrected on grammar, lexis and mechanics of writing, while the latter favored feedback on content and organization. The empirical evidence also indicates that many learners are in favor of comments dealing with specific difficulties, concrete suggestions for improvement, indirect ways of responding to errors which foster greater involvement, and a combination of CF with other sources, such as individual conferences (e.g. Hedgcock and Lefkowitz 1994; Leki 1991; Saito 1994; Hyland 1998). Similar findings have been reported for practitioners, with the studies by Lee (2004, 2008) demonstrating that, similarly to their students, teachers in Hong Kong manifest a predilection for comprehensive correction (Lee 2004), and that they tend to focus on grammatical errors, and their decisions are impacted by a myriad of contextual factors, related, among others, to their beliefs, knowledge, institutional policies, etc. (Lee 2008). Also of interest is the research project conducted by Montgomery and Baker (2007), which proved that there was a gap between teachers' perceptions and their actual practices, but also showed that there was much overlap between the way learners perceived feedback and teachers' self-assessments of how they conducted error treatment.

These positive reactions to written correction, although frowned upon by some theorists and researchers (see the discussion above), can be regarded as extremely welcome in view of the fact that there is abundant empirical support for the overall effectiveness of written CF. For one thing, this support derives from revision studies, such as those undertaken by Ferris and Roberts (2001), Chandler (2003), or Ferris (2006), which showed that error correction has a positive effect on learners' ability to eliminate inaccuracies in their writing on being supplied with feedback on a wide spectrum of errors, with the caveat that although studies of this kind may be important for the development of writing strategies and processes, they provide little evidence for long-term acquisition of the targeted features (cf.

Sheen 2007; Ellis et al. 2008). The positive effects of written error correction have also been demonstrated in the outcomes of experimental studies, both the early ones, afflicted by methodological flaws (e.g. Landale 1982; Frantzen 1995), and those more recent, characterized by far greater rigor in their design (e.g. Sheen 2007; Bitchener 2008; Sheen 2010b). It should also be emphasized that the latter have mainly explored the effects of *focused feedback*, limited to a single linguistic feature or a set of such features, which seems to indicate that this kind of correction is particularly beneficial, an assumption that has been corroborated by Sheen et al. (2009), who provided evidence for its superiority over unfocused CF, which targets a wide range of TL features.

As far as the value of different types of written error correction is concerned, it has been shown that, on the whole, *direct feedback* is more effective than *indirect feedback* (Bitchener 2008; Bitchener and Knoch 2008, 2009, etc.), although the latter has been found to generate greater engagement on the part of learners (e.g. Ferris 2006). Irrespective of whether the CF is direct or indirect, its effectiveness also seems to be enhanced when learners are provided with metalinguistic information concerning the nature of the errors they commit, a finding that was reported, among others, by Bitchener (2008), Bitchener and Knoch (2010), and Sheen (2010b). In addition, somewhat in line with the preferences expressed by some learners, particularly effective may be combining different types and sources of written correction, as is evident in the study conducted by Bitchener et al. (2005), who demonstrated that it was direct feedback complemented with one-on-one conferencing that turned out to be the most beneficial. Attempts have also been made to compare the contribution of corrective feedback and reformulation, and it was found that the former is usually more effective than the latter (e.g. Qi and Lapkin 2001; Sachs and Polio 2007). Even though there is much theoretical justification for reliance upon peer-correction, stemming, for example, from process writing and collaborative learning approaches, as well as Sociocultural Theory and Interaction-based Theories (cf. Liu and Hansen 2002; Hyland and Hyland 2006), the evidence for its usefulness is tenuous. As Hyland and Hyland (2006: 90) write, “[s]tudies have questioned L2 students’ ability to offer useful feedback to each other and queried the extent to which students are prepared to use their peers’ comments in their revisions”, a situation which they account for in terms of students’ unfavorable perceptions of peer feedback (e.g. Nelson and Carson 1998) and serious reservations concerning the quality of such correction (e.g. Leki 1990).

The vast bulk of research on written CF has ignored the impact of individual, linguistic and contextual factors, on the effects of the intervention, giving priority instead to determining the value of specific corrective techniques (cf. Ellis 2010). Nonetheless, there is empirical evidence that the effectiveness of correction in the written medium is a function of such *learner-related variables* as motivation (e.g. Goldstein 2006), language aptitude (Sheen 2007), beliefs (Storch and Wigglesworth 2010), as well as the level of proficiency (Ferris and Roberts 2001). As to *linguistic factors*, they have seldom been included as a separate variable in

research on written CF and they have typically been interpreted in terms of the distinction between treatable and untreatable errors (Ferris 1999; see Sect. 3 above). It has been found, for example, that learners are much more successful in eliminating the former than the latter, although there are different levels of difficulty within these two categories (Ferris and Roberts 2001), and that direct correction might be more beneficial for untreatable errors while indirect feedback for treatable errors (Ferris 2006). The least is known about the impact of contextual factors, two important exceptions being the research projects undertaken by Bitchener and Knoch (2008), and Given and Schallert (2008). The former investigated the macro level and found that there existed only minor differences in the utility of different CF options between international and migrant students in New Zealand, whereas the latter focused on the micro level, providing evidence that the *rapport between teachers and students* may play a pivotal role when it comes to the actual use of written CF, because mutual trust translates into faithful employment of the suggestions made in revisions, thereby leading to greater improvement.

As mentioned above, most of the research on learner engagement with written CF has focused on the behavioral and cognitive response to the corrective information, although it has to be admitted that the distinction between the two may often be blurred, particularly in cases when learners are requested to discuss and reflect on the direct or indirect feedback they receive on their writing or the reformulations of their initial texts, a task that is an integral part of reformulation studies. This is because the occurrence, nature and outcome of a language-related episode (i.e. a segment of interaction with an explicit focus on linguistic items) can be viewed both in terms of a behavioral response, since a particular issue is raised and dealt with, and a cognitive response, as the ways in which learners interact and go about collaboratively solving the problem is indicative of the level of noticing and awareness of a specific linguistic feature. Moreover, in such cases, the behavioral and cognitive response may merge or at least interact with the *affective response* as well as individual and contextual factors on account of the fact that the depth of processing is likely to vary depending on the attitudes towards the interlocutors, personality and learning styles, or the conditions in which the reflection occurs (cf. Pawlak 2012). Qi and Lapkin (2001), for instance, demonstrated with the help of think-aloud protocols that *substantive noticing*, in which the rationale for particular decisions is articulated, is superior to *perfunctory noticing*, where no justification is provided, because it has a bearing on the quality of the revisions later made by learners, with this finding having been corroborated by the research projects carried out by Sachs and Polio (2007), Brooks and Swain (2009), and Storch and Wigglesworth (2010). As regards the affective response, Storch and Wigglesworth (2010) provided convincing evidence that uptake and retention of CF as well as the ensuing improvement in writing skills are a function of learners' attitudes, beliefs and goals.

5 Future Research on Written Corrective Feedback

As can be seen from the foregoing discussion, the last two decades have witnessed an increase in the number of studies addressing the effects of written corrective feedback on second and foreign language development, which has been the corollary of the changing views on the role of form-focused instruction and, in particular, the contribution of oral error correction. As a result, our knowledge has considerably been extended in such areas as teachers' and learners' perspectives on written feedback, the contribution of specific corrective techniques, and even the ways in which their effects are shaped by mediating variables as well as the presence and nature of learner engagement. Looking at the available empirical evidence, though, it becomes obvious that researchers have barely begun to scratch the surface in some areas and further research is necessary to offer insights into the conditions that have to be met for written error correction to produce tangible learning outcomes in different contexts and situations, thereby providing a basis for clear-cut pedagogical recommendations. In particular, it is necessary to conduct studies that would continue to explore the value of different types of written CF, not only in relation to the distinction between direct and indirect error correction but also various subtypes thereof, also taking into account the different contexts and populations in which they can be provided. Given the scarcity of research in these areas, equally important are research projects that would tap the impact of mediating variables and the role of learner engagement, also paying attention to the intricate interactions between the types of written CF, as well as various constellations of individual, linguistic and contextual factors. It would be interesting to see, for example, how learners representing different characteristics (e.g. age, motivation, aptitude, anxiety, learning style, proficiency) respond to different CF options within the direct and indirect categories, the extent to which the value of such options is affected by linguistic factors (e.g. treatable vs. untreatable errors, level of difficulty in terms of explicit and implicit knowledge), and the likelihood that their use will trigger the desired level of engagement in terms of the behavioral, cognitive and affective response.

Although major strides have been made with respect to the methodology of research on written error correction, further improvement is clearly indispensable in this respect. More precisely, there is a need to involve larger numbers of participants, extend the duration of the instructional treatments, isolate the contribution of separate feedback variables, and devise more innovative ways of examining the impact of individual, linguistic and contextual factors, as well as the nature of learner engagement. It is also advisable to place greater emphasis on exploring the longitudinal contributions of pedagogic interventions, trace learners' progress through developmental stages, and perhaps include outcome measures that would tap both explicit and implicit knowledge, particularly in the long term. Without doubt, there is also a place for *process-product studies* that would connect what transpires in a lesson, individual learners' interactions with feedback or collaborative discussions of the possible revisions, and the impact of different CF

techniques. Of particular interest is also the proposal put forward by Ferris (2010), who argues that L2 writing research and SLA research should be viewed as complimentary rather than mutually exclusive, and thus distinctive features of their design could be combined to provide more valuable insights into the contribution of written CF. This would involve investigating the effects of different written feedback options, first, on learners' ability to revise their initial texts and, second, the impact of such correction and revision on the composition of entirely new pieces of writing. Ferris (2010: 194) writes that "(...) analysis of response, revision and subsequent texts could be roughly compared to an experimental pretest-posttest-delayed posttest design that would thus be both contextualized and longitudinal". What is of particular significance, the adoption of such *blended research designs* would allow researchers to gain a more differentiated and multi-faceted perspective on the effects of different types of written error correction, to establish the value of focused or unfocused feedback on various types of errors, and to consider the influence of moderating variables. This does not mean of course, that other research designs should be abandoned, as it is clear that questionnaire, revision, experimental and reformulations studies also have the potential of providing us with important pieces of the puzzle concerning the impact of written corrective feedback on the development of different aspects of second and foreign languages. The more of those pieces fall into place, the easier it will become to offer feasible guidelines for classroom practice.

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