



Learner engagement with corrective feedback using think-aloud protocols

 Castledown



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Online language learning environments where asynchronous communication is the main form of relation between learners and teachers require learners to use self-regulatory skills that help them control their learning process and compensate for the lack of interaction with their teachers (Fernández-Toro & Furnborough, 2014; Fernández-Toro & Hurd, 2014). In such a context, feedback can constitute a driver of self-regulation, facilitating information about the learning process that can contribute to the development of self-regulatory skills (Yu, Jiang & Zhou, 2020). The present article aims at providing insights about how online learners of German as a foreign language engage with written corrective feedback and co-construct meaning (Nicol, 2010). The eleven participants received two different types of corrective feedback: direct explicit feedback on one written assignment and indirect feedback using metalinguistic information and error categorization on the other. Upon receiving the feedback information, the learners were asked to carry out two screen-recorded think-aloud protocols. This article reports on the data obtained through these protocols after conducting thematic analysis (Brown & Clarke, 2006). The results show how learners engaged with each feedback modality and reveal that the feedback-revision generated expression of self-regulatory actions such as reflection on their performance, evaluation and planning.

Keywords: Computer-assisted language learning, corrective feedback, Self-regulated learning, learner engagement, direct and indirect feedback, second language writing

1. Introduction

Practitioners in the field of online language teaching and learning are concerned with the quality and the long-term effects of the feedback provided to their learners due to several reasons. Firstly, feedback should work as a key element in the learning process, giving orientation about the learners' performance and, above all, clues about how to improve. Secondly, because feedback is among the most important elements of social presence in the fully virtual learning environment in which we carry out our teaching (Butler & Winne, 1995). Finally, because giving feedback is an arduous and time-consuming task, especially in online language teaching where personalised and frequent feedback is hard to achieve, particularly in large groups (Nicol, 2010).

In the field of (online) language teaching and learning, considerable teachers' workload, large learner groups and time constraints, as well as inherited assumptions about what feedback should look like (Hyland, 2003; Mahfoodh, 2017; Martínez-Argüelles *et al.*, 2015) often lead to a practice that does not go much beyond the marking, the commenting and eventually the correction of incorrect forms. Adaptive or reflective elements, advice on possible strategies to avoid future errors, or help with the organisation of more effective learning based on the analysis of the assignments or formative assessment (Andrade & Cizek, 2010) are normally inexistent or far from comprehensive and detailed (Nicol, 2010).

In this given framework, our interest lies in how learners engage with two different feedback modalities, one of which has been related with deeper cognitive processing and reinforced autonomous learning (indirect feedback, Westmacott, 2017). The study aims to find out the extent to which the engagement with each of the feedback modalities reveals any information about learners' plans of how to further organise and articulate their learning in a self-regulated way.

2. Literature review

2.1 Learners' perceptions of and engagement with feedback

Feedback is understood as information given on the quality or accuracy of a piece of work or performance taking into account a previously established goal (Ferreira, 2006; Hattie & Timperley, 2007). However, the feedback cycle is only complete if the learner reacts to the provided information with new action aimed at a further approximation towards the previously stated goals or reformulating these goals in order to make them achievable (Black & William, 1998; Ellis, 2009; Hattie & Timperley, 2007).

Other authors (Ellis, 2009; Fernández-Toro & Hurd, 2014; Furnborough & Truman, 2009; Nicol, 2010; Nicol & McFarlane-Dick, 2006) claim that feedback can only be considered as such if it triggers actions that are directed towards an improvement in performance. Whether action is taken or not depends greatly on the way feedback is understood and perceived by the learners. It is therefore

crucial to identify parameters that define those qualities of feedback that help learners to “strengthen [their] capacity to self-regulate their own performance” (Nicol & McFarlane-Dick, p. 205).

Feedback can also have an impact on learners’ language learning development, confidence and motivation. Furnborough and Truman (2009) found that only those learners who used the feedback strategically and were able to integrate it in their learning process also showed benefits in other areas (motivation and confidence) which are crucial to achieve self-regulation. In a more recent study and after analysing the learners’ cognitive, metacognitive and affective responses to the feedback, Fernández-Toro and Furnborough (2014) concluded that learners’ responses mostly displayed elements that can characterize an effective feedback dialogue, such as the ability to integrate the feedback.

Learner engagement is a central aspect of the learning process especially when learners attend to the feedback provided by their teachers. Learner engagement with written corrective feedback has been examined from several perspectives. Some of the aspects which have been investigated have been focused on form (Han & Hyland, 2015; Hyland, 2003), the depth of processing (Leow, 2020), affective engagement (Mahfoodh, 2017), monitoring and editing (Ferris *et al.*, 2013).

Think-aloud protocols (TAPs) have also been used to examine whether teachers focus on formal language in their feedback and the use that learners make of it. Hyland (2003) revealed that language accuracy was a particularly important aspect in teachers’ feedback and that learners reported using that feedback to revise their drafts but to different extents, evidencing variability between individual uses of teacher feedback.

More recently, Han and Hyland (2015) have explored learner engagement with written corrective feedback and argue that the effectiveness of the feedback on revised drafts was not always consistent with the depth in which learner’s engaged with feedback. The findings of their study of Chinese learners of English highlighted again individual variation in all dimensions of the engagement examined (cognitive, behavioural, and affective). The authors indicated that this might be due to different learner beliefs and goals, the manner in which feedback was provided (interactionally) and the type of feedback (indirect feedback).

Finally, the relation between the emotional responses towards written feedback has also been examined. Specifically, Mahfoodh (2017) used TAPs and interviews to examine learners’ responses to teacher feedback and concluded that learners’ emotions determined to a large extent the understanding of the feedback and the success of later revisions.

2.2 Direct versus indirect feedback and think-aloud protocols

The effects of different types of feedback on error has been highly debated without reaching a consensus. Some authors argue that direct feedback is more beneficial because it provides more information on the exact error and the



correct form (Bitchener & Knoch, 2010; Nassaji, 2015), whereas other research indicated that indirect feedback helps engaging learners in deeper learning and thus become more self-regulated learners (Ferris & Roberts, 2001; Lalande, 1982; Westmacott, 2017).

Specifically, and in connection with the type of feedback that concerns us, Westmacott (2017) investigated six upper intermediate EFL learners' opinions about the affordances of direct versus indirect feedback by means of a questionnaire and semi-structured interviews. Most learners expressed their preference for indirect feedback as they found it more useful and they claimed it fostered deeper cognitive processing and reinforced autonomous learning while also strengthening grammatical knowledge. Similarly, we would expect that the indirect feedback teachers provided in the current study would lead to more substantial learner engagement with the feedback.

Some studies (Hyland, 2003; Sachs & Polio, 2007) used TAPs in order to investigate aspects of the provision or reception of feedback practices. These protocols were used with teachers in Hyland (2003) in order to find out the type of feedback they were providing and with learners in Sachs and Polio (2007) to examine attention processes and evidence of noticing (and focus on form). The current research uses TAPs with learners to fill a gap in the existing literature on learner engagement with different feedback modalities and learners' intentions of using self-regulation strategies.

2.3 Online-learning, feedback and self-regulation

In the context of this study, we understand online-learning as learning in computer-assisted learning environments, supported with asynchronous communication between learners and teachers and among peers, and enriched with a wide array of digital learning resources in different formats.

Such environments allow for increased flexibility and access to a large amount of information and resources, even beyond the core learning materials provided as course contents. At the same time, the technologically mediated communication lacks face-to-face interaction and can lead to time-delays in teacher response.

Online-learning, feedback and self-regulation can be seen as strongly inter-related concepts. Fernández-Toro & Hurd (2014) consider feedback in online-learning environments as particularly important. The authors claim that an effective feedback dialogue between teachers and learners is essential to successful learning. Jensen, Bearman and Boud (2021) see feedback in online learning as "one of few processes that connects individual learners to instructors and peers" (p. 1).

Regarding the potential to generate meaningful interpersonal communication and interaction, Ice, Swan and Díaz (2010) report claims that asynchronous online learning-environments are unfit to provide a sufficiently rich environment to trigger socially mediated learning in a constructivist sense because they lack social presence. However, the authors defend that social presence can be seen as a perceptual instead of just a physical quality that can

be achieved by projecting oneself into the virtual environment via forums or other means of communication, such as audio-files (Ice *et al.*, 2010, p. 114). The authors examined the learners' perceptions of text-based and audio feedback and came to the conclusion that the combination of text and audio-feedback was the most positively valued feedback-method in general, while feedback at the micro-level received more positive response when it was only written.

In addition to the notion that feedback plays an eminent role due to its capacity to cover the need for communication and support in the face of non-existent face-to-face interaction, the literature also reveals the importance of self-regulation in online learning. Hartely and Bendixen (2001) argue that computer-based learning environments with their increased flexibility and access to media-rich sources of information require higher order thinking-skills similar to the self-regulation strategies described above. Artino and Stephens (2009) see the need for self-regulation skills in online teaching and learning in the "the relatively autonomous nature of online learning environments compared to traditional classroom contexts" (p. 147).

Similarly, Bol and Garner (2011) claim that the ability to use self-regulation strategies in an effective way is especially important in online-learning due to the largely autonomous nature of online-learning and the relative lack of the type of support and scaffolding that could be provided by a teacher in a face-to-face environment.

From a different angle, online-learning can also be understood as an opportunity to promote and enhance self-regulation by integrating SRL-elements in the course design (Triquet, *et. al.*, 2017).

Existing models of self-regulated learning (SRL) (Panadero, 2017; Zimmerman & Moylan, 2009; Winne, 2008; Schmitz and Wiese, 2006; Pintrich, Wolters & Baxter, 2000; Zimmerman, 2000) place activities in three main areas, namely cognition, motivation and emotion, and identify different phases in which self-regulation unfolds, such as (a) planification, (b) execution and (c) self-reflection (Zimmerman & Moylan, 2009) or (a) Forethought, planning and motivation, (b) monitoring, (c) control and (d) reaction and reflection (Pintrich *et al.*, 2000)

Current research converges in the idea that feedback plays an important role in the development of self-regulated learning (Fernández-Toro & Furnborough, 2014; Nicol, 2010; Nicol & McFarlane-Dick, 2006). Butler and Winne (1995) call self-regulation "a pivot upon which students' achievement turns" (p. 245). Zimmerman (1990) claims that "virtually all researchers assume that self-regulation depends on continuing feedback of learning effectiveness." (Zimmerman, 1990, pp. 5–6)

According to Leow (2018; 2020) the processing of the feedback, its depth and level of awareness are reflected by several cognitive actions such as the activation of accurate prior knowledge, analysis, comparison, hypothesis testing and rule formulation. These actions also appear in the specific literature about self-regulation as self-regulating strategies (Oxford, 2010; Pintrich *et al.*, 2000; Zimmerman & Moylan, 2009).

3. Aims and research questions

The objective of the present research is to examine how learners work through different corrective feedback modalities on written assignments and to find out to what extent this feedback generates examples of self-regulatory actions or shows learners' expressions of intention to apply self-regulation strategies. In this sense, the present article examines the relationship between learner engagement with feedback and self-regulation in foreign language learning which has been largely overlooked in earlier research on corrective feedback. Therefore, there is a need to consider contextual factors, such as the learners' beliefs and attitudes towards feedback, their feedback-preferences or the underlying teaching method, among others, that seem to have a significant modulating influence on how learners benefit from feedback (Chen, Nassaji & Liu, 2016; Ellis, 2010; Fernández-Toro & Hurd, 2014; Han, 2019)

A comparison of the learners' engagement with different types of feedback intends to inform about possible differences in the way the applied feedback-modalities are received by the learners, and to identify their affordances to foster a meaningful approach that generates ideas about the application of self-regulation strategies with the aim of future performance improvement.

The following research questions will guide our research.

1. How do online language learners engage with different modalities of written corrective feedback?
2. To what extent do learners express self-regulation aimed at improving their writing-performance when engaging with the feedback?

4. Method

4.1 Context

The study was conducted at a fully online university in Spain which delivers courses of German as a foreign language following a task-based language teaching methodology based on asynchronous communication and collaboration.

The German courses cover levels A1 to B2 of the Common European Framework for Languages (CEFR) with about 250 enrolled students per semester and a maximum ratio of 50 students per classroom. Learners have access to course content and learning resources and have to carry out a total of five complex assignments which are assessed. Each assignment consists of written, oral and interactive tasks. The learners are permanently supported and assessed by their online teacher. The resources and tasks aim to recreate everyday communicative situations, therefore written assignments are normally letters, emails or other communicative texts that have a clear addressee and a concrete communicative goal.

4.2 Participants

We received a total of eleven complete responses on our call for participation in the project. Consequently, our multiple case study was carried out with 11 learners of German as a foreign language in the A2 (N = 4) and B1 (N = 7) CEFR levels. The instructor who provided the feedback is an experienced online language teacher who has taught A2 and B1 German courses at the above-mentioned institution for four semesters. The participants were nine females and two males with ages ranging between 23 and 53. All but one participant had previous experiences in online learning. The levels were chosen to make sure the learners had the necessary level of language skills and to be able to work with more content-rich written assignments than in lower levels.

4.3 Feedback modalities

The learners receive personalised feedback for every individual language production included in the continuous assessment system. The feedback modalities we adopted in the present study coincide with the ones identified by Ellis (2009):

- a. Text-based direct feedback providing the correct form
- b. Text-based indirect feedback providing error codes and metalinguistic information

Both modalities indicated the exact location of the error (explicit feedback; Westmacott, 2017). We provided focused feedback concentrating only on errors which were not beyond the learners' proficiency level and which were related to the specific requirements of the task (Ferris, 2015 referring to Lalande, 1982; Horbačauskienė & Kasperaviciene, 2015; McMartin-Miller, 2014).

The annotation tool MARKIN (<https://www.cict.co.uk/markin/>) was used to homogenize the indirect written feedback among teachers. The tool allowed us to predefine error codes and associate them to buttons that were used after marking the incorrect word or passage in the text. Buttons could also provide additional information about the error type and links to websites that offered further explanations. The resulting HTML-document had simple navigation functions that allowed learners to open and close boxes with metalinguistic information next to the marked error and provided a table with an error count.

The direct written feedback was provided by means of a word document with footnotes addressing the mistakes the teacher chose to correct. As illustrated in Table 1, the feedback was provided on two different subsequent written assignments. In level A2 the first assignment received indirect feedback and the second one received direct feedback. In level B1, the first assignment received direct feedback, while the second one was treated with indirect feedback. The pairing of assignments and feedback-modalities is based on the given reality in the courses where forum-texts (assignment B in level A2.2 and assignment A in level B1.1) are usually commented by the teacher within the same forum while text-files are run through the annotation-tool MARKIN. In such circumstances it seemed to be preferable to apply direct feedback for the

forum-based assignments and indirect feedback with the help of MARKIN for the individually delivered WORD-based texts in assignment B, level A2.2 and assignment A, level B1.1. Although the topic was different, the assignments had similar length requirements.

Table 1

| | Assignment #1 | Topic | Assignment #2 | Topic |
|----|----------------------|---|----------------------|--|
| A2 | Indirect feedback | A written description of a family photo (text-file) | Direct feedback | A description of a holiday (forum-text) |
| B1 | Direct feedback | Story of an event (forum-text) | Indirect feedback | Hypothetical events: what would have happened if...? (text-file) |

4.4 Instruments

We chose think-aloud-protocols (TAPs) as our instrument for data collection. TAPs have their basis in the field of psychology and were initially described and developed by Ericsson & Simon (1984). According to Ericsson and Simon (1993), the think-aloud technique can capture what is held in the short-term memory while the participants are completing a given task and reflects what happens cognitively during the completion of this task. During TAPs, the participants are required to continually speak aloud their thoughts while they are engaged with a determined activity, task or problem (Young, 2005).

In a fully virtual asynchronous environment, our approach of screen-recorded TAPs with the help of a simple screen-recording program (screen-castomatic.com) seemed to be the most appropriate way of observing how the learners work through the feedback, how they react to specific feedback items and how they process the feedback as a whole.

The participants received instructions about how to install and use the program (see Appendix A), alongside guidelines about the think-aloud-process itself that included a recorded example of the process. The TAPs were transcribed, and data were properly anonymised in order to comply with regulations on data privacy and the ethics committees' regulations.

4.5 Data treatment and coding process

We applied thematic analysis, a qualitative analytic method (Braun & Clarke, 2006), in order to identify, isolate and interpret commonly recurring themes in our data set. The transcribed protocols were broken down to single quotations. Quotations represent single acts (statements, reflections, expressions of thoughts and ideas, hypothesis, etc.), differentiated by breaks in the stream of the revision process. The 22 analysed documents generated a total of 892 quotations. Each of these quotations include instances of actions, thoughts, ideas and comments that were labelled with a specific code (see below). Two additional

coders were employed in order to determine inter-coder agreement regarding categories of actions which reached on average 90 percent.



4.5.1 Coding reaction to feedback. The inductive coding allowed us to establish 53 codes that described basic actions and thoughts or ideas expressed by the learners while they worked through the feedback. The codes were grouped under eight categories of actions:

- a. Orientation: The learner carries out actions that lead to a better orientation within the feedback document and the containing information, such as examining the design and functionalities of the feedback, looking up the number of errors, checking the list of marked error types or identifying where the feedback document displays relevant information.
- b. Information seeking: The learner seeks further information about the marked elements, for example by looking up the correct form or checking the metalinguistic information about an error, but also by looking for additional information from external sources. Information seeking can occur before any kind of reflection about the error or marked passage or in order to confirm an already pronounced hypothesis about the error.
- c. Identification: The learner's utterances give information about his/her attempts and success in identifying the type of error.
- d. Correction: The learner tries or declines to correct the highlighted error and succeeds or fails in doing so.
- e. Reflection: The learner's utterances indicate reflective actions, such as thinking about the reasons for an error, commenting on a rule related to the error, pronouncing hypothesis about the nature of the error, etc.
- f. Intention: The learner expresses his/her intention to do something about the error/his/her performance, for instance by repeating a specific language point, looking up error-related information, trying not to repeat the error, etc.
- g. Self-judgment: The learner pronounces judgements about his/her performance, about the number and nature of the committed errors, about his/her insecurity and knowledge, etc.
- h. Feedback evaluation: The learner judges the quality or usefulness of the received feedback.

4.5.2 Self-regulation codes. In order to determine if the above-mentioned actions contained examples of self-regulation, we considered it important to compare our codes or labels with actions that are claimed to reflect self-regulation strategies in the corresponding literature, so that the discussion about our research topic would be based on common terminological ground.

The comparison between the terminology and examples provided by a number of studies related to the field of language teaching and learning and our codes lead us to a selection of three categories containing actions that are

terminologically close to reflect self-regulation strategies in the terms the literature suggests (Table 2).



Table 2. Self-regulation strategies in the literature

| Code | Duncan <i>et al.</i> , 1991 | Bimmel & Ramillon, 2000* | Pintrich, Wolters & Baxter, 2000 | Zimmerman & Moylan, 2009 | Oxford, 2010 |
|---------------------------------|--|---|--|--|--|
| Category "Intention" | Regulating Help seeking | Use help/ resources Ask questions Clarify intentions | Increase effort | Self-reaction (adaptive/ defensive) Self-instruction Task-strategies | Monitoring Evaluating |
| Category "Reflection" | Critical thinking (?)** Rehearsal (?) Elaboration | Analyse and apply rules (?) Create mental relations Use previous knowledge (?) | Attributions | Causal attribution | Conceptualizing (?) Reasoning (?) |
| Category "Self- judgment" | Self-appraisal Self-judgments | Register and express feelings | Cognitive judgments Affective reactions | Self-judgment Self- satisfaction | Activating supportive emotions Generating and maintaining information |

* The original study by Bimmel & Ramillon is in German.

** Question marks indicate reservations against equivalence (explained below)

Some concrete examples might serve to illustrate the relations between our codes and the self-regulation strategies provided by the literature:

- a. Intention
 - ▶ Code: "Expresses intention to write down relevant information" similar to "Use help/resources"; "Increase effort"; "Self-instruction"
- b. Reflection
 - ▶ Code: "Reflects about cause of error" similar to "Causal attribution"
 - ▶ Code: "Relates with L1 or other languages" similar to "Create mental relations"; "Attributions"; "Causal attributions"
- c. Self-judgment
 - ▶ Code: "Expresses knowledge/security about the error" similar to "Self-appraisal"; "Register and express feelings"; "Cognitive judgments"; "Self-satisfaction"; "Activating supportive emotions"

In order to interpret the observed learner behaviour correctly, we have to keep in mind that our TAPs do not show the participants engaged with the initial

writing task but with the feedback revision of that task. Consequently, we had to adapt the identified actions and the different phases in which self-regulation unfolds according to the literature, to our context of feedback revision.

Self-regulating strategies within our research setting could manifest themselves (a) as applied to the task of feedback revision, (b) as a delayed self-reaction and/or retrospective ideas about how the learner could or should have proceeded during the initial writing-task and (c) as prospective ideas about how to improve the learners' performance in future writing-tasks. Only (b) and (c) are relevant within our study as our intention was to establish if the learners' utterances reflected self-regulation strategies related to the writing-task, either retrospectively projected on the previously finished task or prospectively related to subsequent writings.

According to this focus, we did not carry out further analysis of actions that could be interpreted as self-regulation strategies but were clearly related to the revision task and almost entirely found in the category "orientation." Orientation is closely related to task analysis and self-control (Zimmerman & Moylan, 2009) and placed respectively in the planning phase and the execution phase. Concrete examples are identifying the feedback-characteristics, checking the technical elements of the feedback document, seeking orientation about the error types, gaining an overview of the number of errors etc.

5. Findings and discussion

In this section, we are going to offer the results of the thematic analysis based on the material gathered from the TAPs. We will first illustrate the manner in which learners engage with different feedback modalities (direct and indirect) on their written assignments (RQ1). In a second step we are going to determine the extent to which the observed patterns of engagement displayed examples of self-regulation (RQ2).

5.1 RQ1. *How do online language learners engage with different modalities of written corrective feedback?*

As mentioned above, the engagement with the feedback generated a flow of statements, expressions of thoughts, and hypotheses which can be structured into different categories. Overall, utterances that indicate reflection were the most common (204), followed by information-seeking (181), self-judgment (107), error identification (96), and error correction (90). The feedback triggered relatively lower numbers of utterances related with intention (58), orientation (55) and feedback evaluation (26) as shown in Figure 1. These numbers have to be interpreted carefully as they do not necessarily indicate the importance or weight of one category in comparison with another (Braun & Clarke, 2006). The low occurrence of orientation, for instance, can be explained by the fact that learners invested relatively little time to check feedback functionalities and the overall number of errors almost exclusively at the beginning of their revision, while opportunities to express an intention about how to articulate

further learning were given throughout the whole revision process. Feedback evaluation was not very frequent because it was not a necessary part of the revision process and many learners might have considered it neglectable.

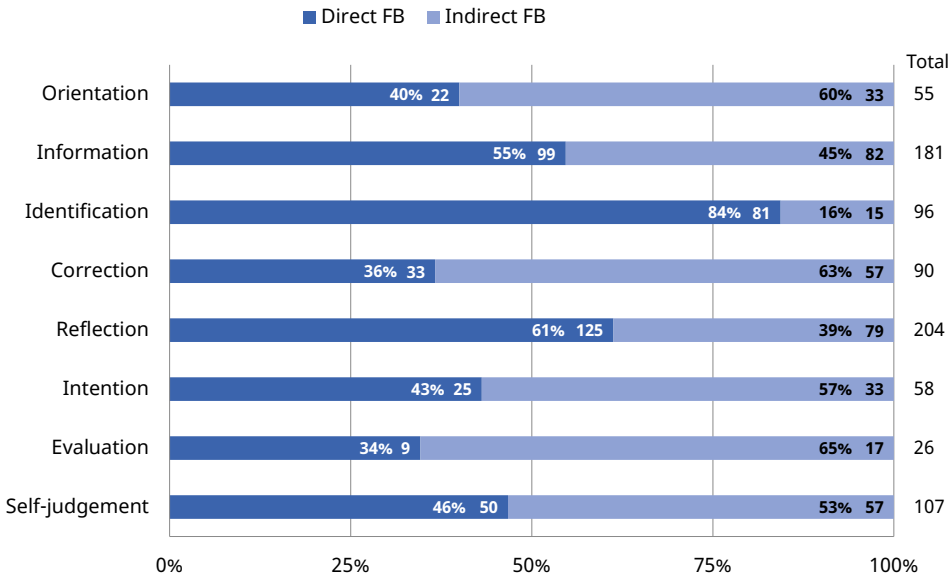


Figure 1. Total of instances by categories

If we compare the two feedback modalities, we can conclude that unlike one would expect according to the existing literature (Westmacott, 2017; Wigglesworth & Storch, 2012), overall, learners engaged more with direct feedback ($N = 444$) than with indirect feedback ($N = 373$). Specifically, we can observe that indirect feedback triggered more instances of orientation, error correction, intention, evaluation and self-judgement, whereas direct feedback generated more information seeking, error identification and reflection. If we focus on the categories which show more discrepancies between the two feedback modalities, we see that error identification and reflection were more common when learners were engaging with direct feedback. On the other hand, the instances of error correction were more common when learners were engaging with indirect feedback. These three categories will be discussed in more detail in the next few paragraphs.

5.1.1 Error identification. The biggest difference between direct feedback and indirect feedback lies in error identification which occurred mostly in direct feedback ($N = 86$, 86%), as shown in Figure 1. This could be due to the fact that learners did not elaborate and express much information about the error type in indirect feedback, most probably because metalinguistic information was already given, whereas direct feedback only indicated the correct form, which, in turn, could motivate learners to give their opinion about the type of error.

The following quotation shows a participant identifying a verb-tense error marked in a direct feedback:

Wie sie gebaut werden, ist ein Rätsel. Okay, here it is a passive voice. That is, the *werden* ... I'm going to look at the notes. Okay, it would be present tense. And the past tense would be *wurden*, okay. Well, I've used the wrong verb tense. Yes. Really ... okay, yes: it has to be *wurden*.

[*Wie sie gebaut werden, ist ein Rätsel* = How they are built is a mystery]

[*werden* = auxiliary verb for passive voice in present tense]

[*wurden* = auxiliary verb for passive voice in past tense]

The participant identifies the error type before looking up the correct form provided by the teacher and only checks it after correcting the error by herself.

The few (N = 14, 14%) utterances reflecting error identification in the context of indirect feedback (see Figure 2), were mainly unsuccessful re-interpretations of the already given error-code in the feedback-document which could be related to difficulties in understanding the codes. Comprehension problems might be due to the relatively higher level of abstraction and complexity of error codes and metalinguistic information provided in indirect feedback in contrast with simpler corrections given in direct feedback.

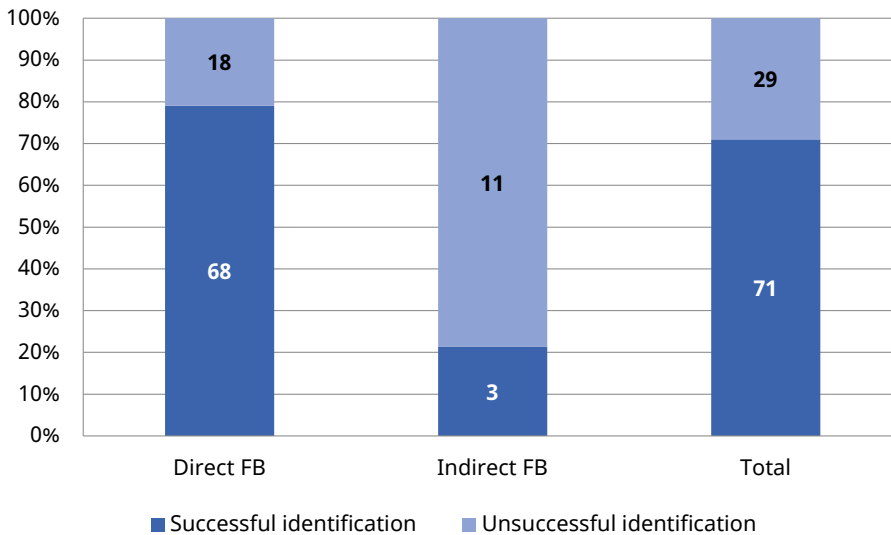


Figure 2. Percentage of successful and unsuccessful error identification by feedback modality

Metalinguistic information can be perceived as denser and more elaborate than an error correction, which might have hindered a thorough understanding of the provided information and lead to problems identifying the error. Our interpretation of the data in this specific case is very much in line with Mahfoodh (2017) and with Hattie and Timperley (2007) who claim that the effectiveness of task-related feedback is inversely proportional to its complexity (p. 92). In a study about the efficacy of various kinds of error feedback, Chandler (2013) observes that learners that had received “descriptions” of their errors were more likely to be discouraged by the feedback than the ones that

received feedback with underlined errors or feedback with corrections. The author also reports that learners needed substantially more correction time in the case of feedback with descriptions in comparison to feedback with corrections, feedback with underlined errors and feedback with underlined errors and descriptions. Both observations seem to indicate that descriptions or metalinguistic error-information can be an added difficulty, rather than an aid.

Zheng and Yu (2018) add another important perspective to effective interaction and uptake in the case of indirect, metalinguistic feedback. The authors claim that the learners' possibility to effectively benefit from metalinguistic information directly depends on their language competence. Similar interpretations can also be seen in Ferris (1995), Ferris and Roberts (2001) or Shintani and Ellis, (2013). According to Zheng and Yu (2018), a low language proficiency could also be the cause for taking a rather superficial attitude towards feedback-revision and problem solving which results in unresolved confusion and a low level of understanding of the feedback. However, our data do not indicate more unsuccessful attempts of error identification within the students belonging to level A2.2 in comparison to the B1.1-students.

Figure 3 shows a feedback-document created with the annotation-tool MARKIN.

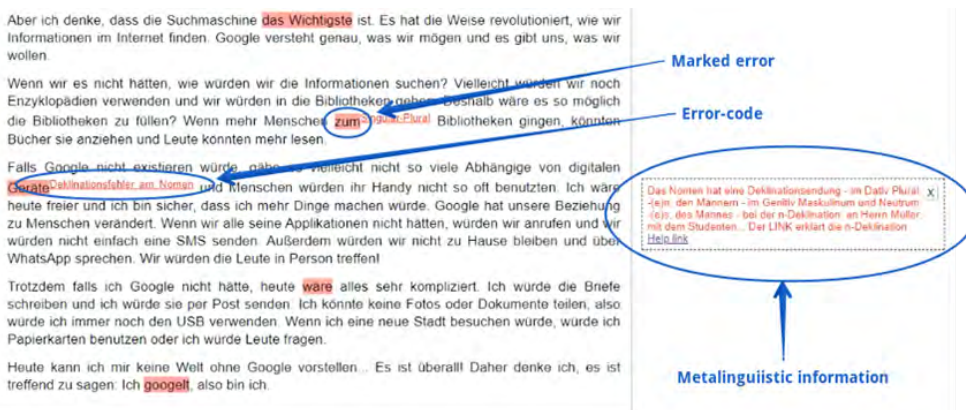


Figure 3. Feedback with MARKIN

The participant that is currently checking the error “Deklinationsfehler am Nomen” (error of declension in the noun) in this document comes to a wrong conclusion about the error despite (or maybe because of) the comprehensiveness and relative complexity of the metalinguistic information related with it. The noun “Geräte” (plural of “Gerät” = “device” is in dative which makes it necessary to add a final *-n*, as explained in the box at the right. The participant, however, comes to a different conclusion (German expressions remain untranslated):

The next error is *Geräte*. Ok this is an example from what I see. Of course, it would have to be plural, therefore *Geräten*, I suppose this is the plural with an *-n* because the other form is singular. This is what I understand here.

5.1.2 Reflection. Examples of reflection, which can be seen as representations of a deeper engagement with the error and the provided feedback information, were clearly more present in the revisions of direct feedback. Direct feedback generated more thoughts about the cause of the error, more contextual thinking by relating the error with the L1 or other languages or even with other, similar errors in the same composition, it leads to more reflection about the learners' assumptions or intentions when they committed the errors and it triggered more rule-formulation (see Figure 4 below). This result stands in clear contrast against research claiming that indirect feedback, rather than direct feedback, promotes reflection, noticing and attention which are crucial for long-term acquisition (Ferris & Roberts, 2001; Lalande, 1982; Westmacott, 2017).

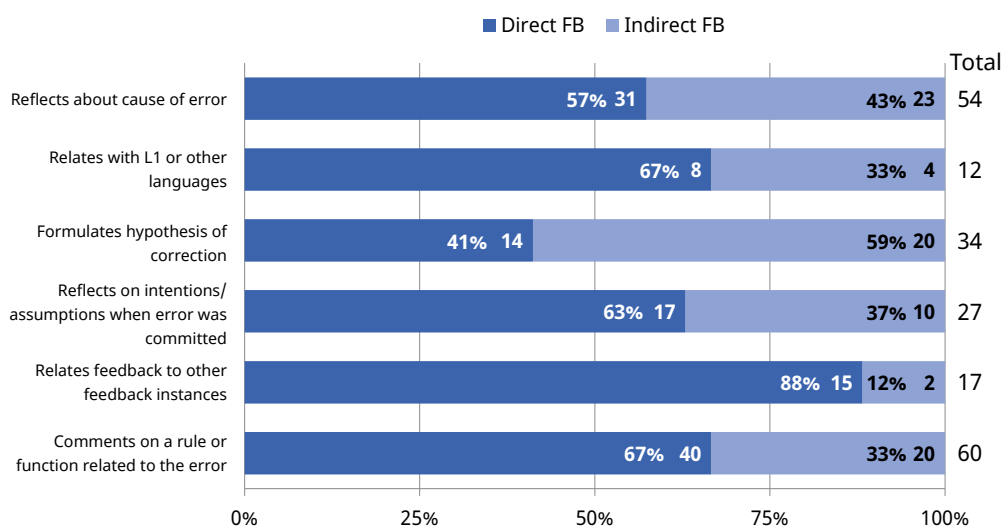


Figure 4. Examples of reflection by feedback modality

The only exception in this pattern was the formulation of a hypothesis of correction. Hypotheses of correction were utterances that rehearsed a possible error correction in the form of a guess or a question. These utterances were normally followed by a confirmation of the hypothesis by checking either the correct form in case of direct feedback or the metalinguistic information provided in the context of indirect feedback. In our view, it is not surprising that direct feedback generated fewer examples of hypotheses of correction than indirect feedback because the learners could just look up the correct form provided by the teacher. Nonetheless over 41% (N = 14) of the observed examples of correction hypotheses occurred in direct feedback, showing that learners made the effort of reflecting about the marked error before checking the correct form, making the exercise or reviewing direct feedback actually resemble indirect feedback.

Again, the apparent disadvantage of indirect feedback might be due to the complexity of the information provided that could have overwhelmed learners. The feedback document created with the annotation software MARKIN offers

information in three levels: (a) the coloured marking of the error, (b) the error-code and (b) additional metalinguistic information about the error (see Figure 3). In comparison, direct feedback looks simpler, offering only the highlighted errors in the text with attached footnotes that show the correct form.

5.1.3 Correction. The correction category included four different actions as shown in Figure 5. Straightforward error correction means that learners attempt self-corrections based on the information given in the feedback. In the case of direct feedback, the error correction (19%) was done before checking the correct form provided by the teacher. The learners saw the error highlighted, attempted the correction and confirmed their correction afterwards by checking the teacher-provided correct form, again another example of the learners making the exercise of guessing the type of error committed which approximates to the rationale behind providing indirect feedback.

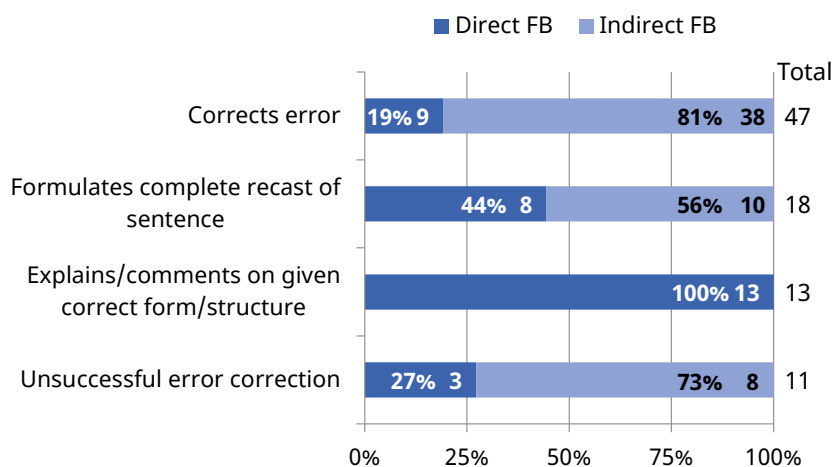


Figure 5. Corrective actions by feedback modality

In the case of indirect feedback, learners could directly see the error code next to the highlighted error, which is already a plus of information that can guide the subsequent correction of the error. In many cases, learners also checked the additional metalinguistic information that pops-up by clicking on the annotation with the error code. The absence of the correct form in the feedback document seems to have driven learners in many more cases (N = 38) to carry out the error correction by themselves with the help of the information provided.

The following quotation shows a participant carrying out a successful correction based on the error-code “declension” where she had used a dative-ending for a subject (German expressions remain untranslated):

[...] *steht meinem Vater Xisco*, ... let’s see ... *meinem*. Declension! Obvious! Here it might be that the thing would be ... Okay here *Vater* is the subject. He is. So, if he is the subject it would be *ein Vater* because he is nominative. I guess, yes, yes *mein Vater*. Nominative masculine.

[*steht meinem Vater = my father is standing]
[meinem/mein = my dative/nominative]



Giving explanations or comments on a corrected form or structure does not apply to indirect feedback as this modality did not provide explicit error corrections. It was included in the correction category because it showed learners' intention to somehow participate in the error correction process carried out by the teacher by adding additional information to the correct form, expressing understanding and agreement. Such comments or explanations often came in combination with reflections about a rule and/or about the cause of an error.

5.2 RQ2. *To what extent learners express self-regulation aimed at improving their performance when engaging with the feedback?*

As mentioned earlier in the coding process, we identified three categories of self-regulatory strategies in expressions of intentions, reflections and self-judgement which largely correspond to existing categories as detailed in the method's section. Overall, and as shown in Figure 1 at the beginning of section 5.1, expressions about reflections (N = 204) were twice as common as self-judgement expressions (N = 107), which in turn also doubled the amount of intentions (N = 58).

Comparing direct and indirect feedback, we could observe more examples of reflection in direct feedback than in indirect feedback (61% vs. 39%), more examples of intention in indirect feedback than in direct feedback (57% vs. 43%) and an almost equal distribution in the case of self-judgment with a slight tilt towards indirect feedback (53% vs. 46% approximately).

Expressions of self-judgement typically occur (a) when learners check the general quality of their performance by looking at the total numbers of errors or (b) when learners consider a specific error or the repeated occurrence of identical or similar errors especially unacceptable. Both actions do not seem to be significantly modulated by the feedback-modality.

5.2.1 Expressions of intentions as self-reaction. The 58 expressions of intention we identified could be seen in the context of self-control, self-instruction, help-seeking and self-observation, which are self-regulated learning strategies that appear in Zimmerman and Moylan's model (2009) in the performance-phase. The mentioned strategies are applied by the learner during the performance-phase with the aim of evaluating the adequacy of his/her work and eventually carry out necessary adjustments. Panadero and Alonso-Tapia (2014) see similarities between the self-control during the performance phase and a final self-evaluation.

The intentions expressed by the participants of our study occur within the task of feedback-revision and are therefore situated after the writing-task the feedback was given on, but also before the subsequent writing-task. They reflect what the learners see as necessary adjustments (and ways to enable themselves to carry them out) in view of the subsequent task.

At the same time, they have clear similarities to what Zimmerman and Moylan (2009) define as self-reaction – an affective and cognitive reaction to what the learner identified as success or failure in his/her performance. Self-reaction triggers the process of adaptive or defensive inferences. Adaptive inferences are the ones that seek an effective modification of the so far applied strategies in order to improve the overall result of the performance and reach the stated goals. All examples of intentions (except one) identified in our study can be seen as adaptive inferences.

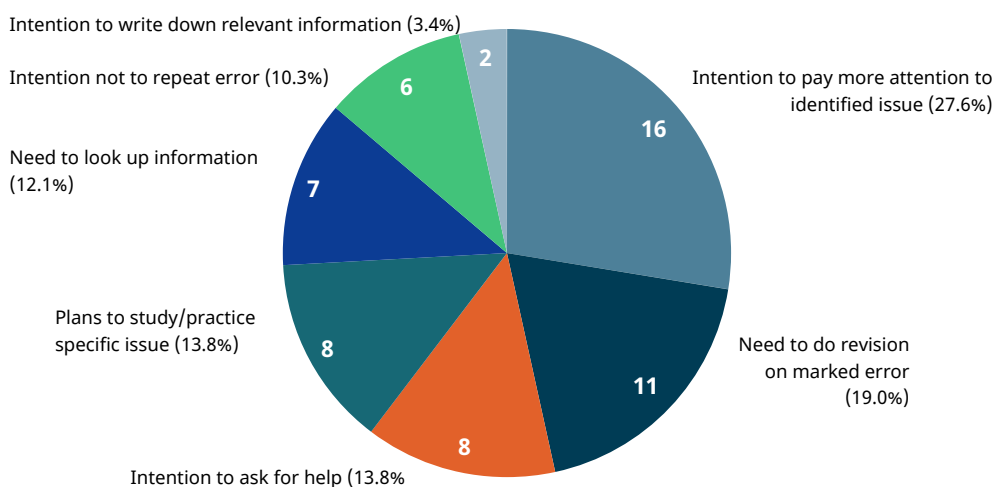


Figure 6. Instances of expressions of intentions

However, and as seen in Figure 6, the learners' expressions regarding possible future actions (intentions) in order to improve their performance were generally very vague. The highest scores could be found in the intention to pay more attention to the identified problem (N = 16, 27.6%) and the need to revise the topic related to the marked error (N = 11, 19%). Another five instances expressed the intention of not repeating the errors, another unspecific plan, therefore the feedback-revision seemingly did not trigger a considerable amount of concrete ideas about how to organise further learning in order to close the gap between the intended and the real level of performance.

A dissonant element within the category of intentions is help-seeking (N = 8, 13.8%). As mentioned above, help-seeking is generally considered a self-regulation strategy carried out in the performance-phase (Zimmerman & Moylan, 2009) where asking for help becomes a relevant strategy when the learner reaches a point where he/she does not know how to go on with the task (Panadero & Alonso-Tapia, 2014). The examples in our study are different in the sense that the help is neither needed for the execution of the writing-task, nor can it be seen as a prospective element for subsequent tasks. It merely looks for a better understanding of the feedback information. Our learners' help-seeking is clearly related to the feedback-revision as a task, which might also explain the difference in the number of instances in the two modalities. While

virtually non-existent in direct feedback, help-seeking intentions indicate that indirect feedback seems to have left the learners with more doubts about the errors and the feedback information itself.

The following quotation is an example for help-seeking in the case of a lexical error:

Why? Okay, *word-choice*. Well..., I don't know. I don't know what other verb it could be. I thought this was the correct one ... let's see if ... if I remember, I'll ask the teacher what verb it could be. Because I suppose that here, I only have this correction, that is, the feedback, this feedback does not tell me the correct option. It only points out my mistakes but not the correct option, so I will try if I remember to ask my teacher what it would be.

5.2.2 Reflections. Out of a total number of 204 reflections, learners commented on a rule or function to the related error (N = 60, 29%) as shown in Figure 7. This kind of reflection seems to be terminologically close to critical thinking (Duncan *et al.*, 1991), the application of rules and use of prior knowledge (Bimmel & Rampillon, 2000), conceptualising and reasoning in Oxford (2010) or to elaboration (Weinstein, Acee & Jung, 2011), where learners create connections between the new information and prior knowledge.

In the following quotation the participant activates his/her knowledge about the declension of articles after prepositions (German expressions remain untranslated):

Okay: *Meine Cousine Júlia steht neben die Pflanze und sie hat ihrem Katze Nami in den Armen halten*. Oh sure, *neben* is a preposition so this should be dative. *Pflanze* is feminine, come on, feminine... *neben die Pflanze* but we have this, so the dative would be *-r, der Pflanze*.

[**Meine Cousine Júlia steht neben die Pflanze und sie hat ihrem Katze Nami in den Armen halten* = My cousin Julia is standing next to the plant and she is holding her cat Nami in her arms]

[*neben* = next to]

[*Pflanze* = plant]

[**neben die Pflanze* = next to the plant]

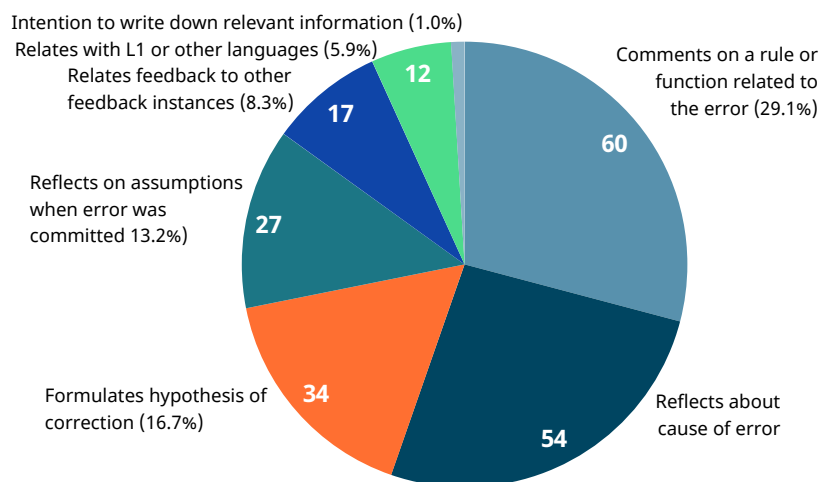


Figure 7. Instances of reflection

However, we should make a distinction between the observed learner behaviour and the self-regulation strategies as presented in the cited literature because the examples we identified do not seem to represent those higher order mental processes of critical thinking and rule application that occur during task engagement, but rather have the character of recalling or indicating a rule that should have been applied during the initial task. As such, they resemble Zimmerman & Moylan's (2009) self-instruction, representing a kind of self-directed orders that accompany the process of understanding and correcting the error.

In the following quotation, the participant displays a whole process of error understanding that implies the comparison with his/her L1, an elaboration on the teacher-provided correct form and the formulation of a rule regarding the verb-position in German main clauses.

The fifth mistake, this is where it is. And I see that there are 2 errors in the use of the comma after *heute*, well it is that in Spanish, for example it would be *Hoy, este coliseo es una visita obligada ...* well, *es una visita obligada en una visita turística*, well, for me in Spanish it would be a comma but, well, it seems not, that it is not correct. And then the use of the *ist*, the verb always in second position. The fifth error would be *heute*, after *heute*, without a comma, and then the *ist*, occupying the second position of the phrase.

[*heute* = today]

[*Hoy, este coliseo es una visita obligada en una visita turística* = Today this colosseum is a must see on a sightseeing tour]

[*ist* = is]

In our study, learners formulate language rules related to an error during feedback-revision after the completion of the writing task. We interpret this behaviour as a mental repetition of the initial engagement in the writing-task, a retrospective application of a strategy based on verbalisation that nonetheless

could have similar benefits in terms of learning and self-regulation as Schunk (1986) suggests.

The reflections about the cause of the error (N = 54) and the learner's intentions or assumptions when the error was committed (N = 27) represent almost 40% of the total amount of actions in the category "reflection" and can be interpreted as examples of causal attribution (Zimmerman & Moylan, 2009). With causal attributions, the learner formulates a reason as to why the error occurred (Panadero & Alonso-Tapia, 2014). As such, these explanations aim at linking the responsibility of the error to different factors, such as preconceptions about the target language, previous knowledge or proficiency level. Causal attributions activate emotions and have a direct influence on the motivation to carry out future tasks (Mahfoodh, 2017).

In the following quotation, the consciousness of the difficulty to deal with lexical issues very clearly leads to a certain amount of frustration that, nonetheless, does not seem to make the participant renounce to continue with his/her efforts to learn and improve (German expressions remain untranslated):

Okay, *dieses Ereignis hat seine Aufmerksamkeit gemacht*. Okay, here I wanted to put that ... that, well, that this caught his attention. So, okay, the word, well, is not correct ... Here, I suppose that what ..., that is, ... I put *gemacht* because I looked for the expression *attract attention* and well, I must have got *machen*, from *machen*, *gemacht* and... But this happens to me a lot, that, like... well, I lack vocabulary, because it depends on where you are looking for it, as German is a very precise language, of course, sometimes the word you choose is not correct. Here I do not know how I could say this *to attract attention* without the *machen*. Uh ... I'll look it up, I'll look it up.

[**Dieses Ereignis hat seine Aufmerksamkeit gemacht* = This event caught his attention]

[*machen*, *gemacht* = make, made]

The formulation of a hypothesis of an error correction (N = 34), apart from showing active cognitive engagement with the given information, appears to be a use of previous knowledge (Bimmel & Rampillon, 2000) and as such a self-regulation strategy. In our case, this happens during feedback-revision after the completion of the original task making it problematic to give these examples the same attributions as to the use of previous knowledge in the planning phase or during the execution of the task, where it aims at an accurate performance. Similar to the above-mentioned examples of rule-application, it could be seen as a retrospective application of a strategy.

The relation of the identified error with the L1 or other languages (N = 12) or with other errors highlighted in the feedback (N = 17) seem to be in line with what Bimmel and Rampillon (2000) call "create mental relations" and with the concept "elaboration" in Duncan *et al.* (1991). The learners create internal connections between errors, as well as analogies between comparable structures in different languages. They use compare-and-contrast-strategies and integrate and connect the information given in the feedback with prior

knowledge. Elaboration requires active cognitive processing (Weinstein *et al.*, 2011). Expressed relations between different errors and, even more so, between comparable phenomena in different languages could be seen as a self-regulation strategy triggered by feedback.

However, we formulate this last claim with caution because the observed examples are lacking an element of intent. The learners did not seem to deliberately apply the strategy of elaboration with the aim of reaching a higher level of control over the errors so that subsequent writing tasks could be better performed. Instead, in the case of comparison with other feedback-instances, the predominant point seems to be detecting repeated examples of the same type of error, while the instances of comparisons with the L1 or other languages in almost all cases (10 out of 12) appear as part of reflections about the cause of the error or about L1-influence.

5.2.3 Self-judgment. Self-judgment as a self-regulation strategy is expected to emerge in the self-reflection phase according to Zimmerman and Moylan (2009). Self-judgment refers to the way learners judge the quality of their performance modulated by the level of perfection the learners intended to achieve (Panadero & Alonso-Tapia, 2014).

In our case, out of the 104 cases of self-judgement seen in Figure 8, the learners did not use the achievement criteria given in each assignment as a reference to measure their performance, but usually expressed satisfaction or dissatisfaction with the number of errors, the repetition of errors, the level of understanding of the error or the failure to avoid an error in a field that should already be assimilated. This can be seen as in line with what Winne (2011) describes as the learners' own level of requirement, an element that also modulates judgment.

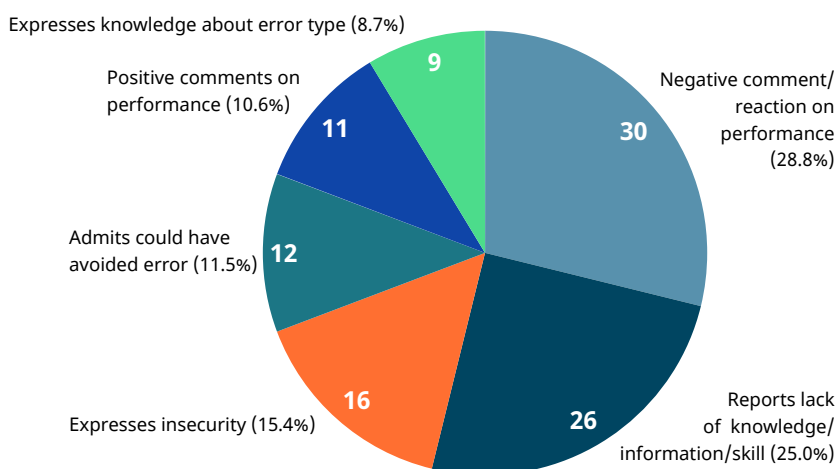


Figure 8. Instances of self-judgement

Feedback based on error-correction or error identification has a predominantly negative look (see Figure 1) and feel as it concentrates solely on the

discrepancies between the employed forms, vocabulary and expressions and the use of the language that is commonly accepted as adequate or correct. Positive comments on the correct use of forms and expressions are possible but happen very seldomly. And although corrective feedback is considered as potentially powerful and as a “pedestal on which the processing and self-regulation is effectively built” (Hattie & Timperley 2007, p. 91), in our study it seems to have generated more examples of negative self-judgement (N = 87), corresponding to the first four types of expressions shown in Figure 8, than positive ones (N = 20, 19%), corresponding to the last two types.

6. Conclusions

In this article we examined the manner in which learners engage with different feedback modalities and were able to find several differences. While direct feedback generates mostly information seeking, error identification and reflection, indirect feedback prompts more orientation, error correction, intention, evaluation and self-judgement. This runs counter to the existing arguments which favour indirect feedback over direct feedback (Ferris & Roberts, 2001; Lalande, 1982) regarding its capabilities to generate reflection which can lead to more accuracy. Bitchener and Ferris (2012), however, indicate that other authors claim that direct feedback may help learners understand the feedback better and avoid the confusion that indirect feedback can cause which seems to be the case in the current study.

In addition, and regarding the self-regulation observed when learners engage with the two types of feedback, our findings point to the fact that self-regulation manifests itself in expressions of reflection to a large extent, self-judgement to a certain extent and less frequently with intentions. The two feedback types produced similar patterns of behaviour regarding intentions and self-judgement which were slightly more common during indirect feedback as it could be expected due to the nature of indirect feedback itself which prompts this type of behaviour. However, and contrary to the expectations, reflections about the error type were more common during the learners engagement with direct feedback, although we found that rather than critical thinking and rule application they constituted a recall of their initial engagement in the writing-task, a retrospective application of a self-regulation strategy, similar to the self-instruction category proposed by Zimmerman and Moylan (2009).

In sum, the current study allowed us to observe instances of learners engaging with feedback, allowing them to reformulate their initial writings in order to improve their texts (Ellis, 2009; Hattie and Timperley, 2007). Therefore, it also provides evidence of the way in which learners express their intentions to conduct actions that are directed towards an improvement in performance, something considered as a fundamental aspect of feedback (Ellis, 2009; Fernández-Toro & Hurd, 2014; Furnborough & Truman, 2009). Finally, several of the observed patterns of behaviour constitute examples of internal feedback, a pre-condition for self-regulation (Butler & Winne, 1995).

This paper has also applied existing self-regulation categories to a new

context other than the usual engagement with tasks, that is, feedback-revision, thereby contributing to the existing body of knowledge about self-regulation applied to feedback reception.

With the aim to show how learners engage with different types of feedback in a real-world teaching and learning environment, we were concerned with the ecological validity of our study. Hence, we tried to retrieve data in a setting as unaltered as possible which took us to observe the learners' actions and engagement within an unmodified time-frame, working on original assignments and revising feedback-documents that did not differ from the modalities that are usually applied in this specific learning-context. This led to some limitations, as for example the reduced control over specific aspects of the assignments, the widely uncontrolled action of the teacher as a feedback-provider and our renouncement to further invade the course of the participants' learning process, for example with focused interviews that could have provided more insights into the learners behaviour and could have helped us discern whether the observed actions were triggered by the feedback or by individual factors such as specific motivations of the learners or TAPs, previous knowledge about self-regulating learning strategies among others.

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Appendix A

Instructions on how to conduct the TAPs

It's now time to review your assignments and record this review with Screencastomatic. During the review, we will ask you to speak aloud to record the immediate and spontaneous thinking generated by the review process.

Attached you can find a document in which I explain how to use Screencastomatic and how to upload the video generated on YouTube. The document includes:

- a. a link to a video with a simple example of how to record your reflection on the feedback and create a “think-aloud-protocol”
- b. another link to a video example of a “think-aloud-protocol”
- c. a link to a Screencastomatic video-tutorial

Please let me know if you have any problems.

