Enhancing Metalinguistic Awareness Through Microlearning: A Comparative Analysis of Catalan Acquisition Between Multilingual French and English Learners

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Abstract

Knowing that previously learned languages may influence and support language learning among multilingual learners, equipping educators with diverse tools and resources empowers them to make more informed decisions in facilitating language learning. This holds particular significance in the case of minority languages like Catalan, where resource availability tends to be more restricted. This paper presents the findings of a project aimed at identifying the specific needs of multilingual B1 learners of Catalan. Using a comprehensive five-way classification system, the study compares the written productions of multilingual learners from different linguistic backgrounds (English and French L1 learners of Catalan). Analyses revealed a similar pattern regarding the nature of the errors, with incorrect word selections at the lexical-semantic, syntactic, and orthographic levels being the most frequent. Both groups differ significantly in terms of the distribution of errors; however, they did not differ when the analyses were conducted by error types. In both cases, the most frequent error was the lexical-semantic misselections, with false analogies and incomplete applications of rules explaining the errors. These findings led to the creation of just-in-time microlearning capsules tailored to address these issues. The microlearning capsules were designed to enhance students' metalinguistic awareness. Students' and teachers' perceptions of the tool were also assessed, and both groups predominantly viewed interlinguistic information as beneficial to language learning. This project highlights how microlearning, tailored to frequent errors, can bolster multilingual learners' acquisition and provides promising tools for language teaching.

Keywords: crosslinguistic perspectives, foreign language learning, language acquisition and learning, support for foreign language teachers, technological tools in foreign language teaching

1. Introduction

Learning a third or additional language (L3/LA) differs from learning a second language (L2) (Bardel & Falk, 2020), and similarities and differences between languages tend to affect the nature of possible interlanguage influences (De Angelis, 2007; González Alonso et al., 2017; Perić & Mijić, 2017; Puig-Mayenco et al., 2018; Salaberry & Kunitz, 2020). Moreover, representations and systems may influence and support language learning in multilingual learners (Puig-Mayenco et al., 2020).The link between research and practice is essential to optimize the selection of appropriate material in the classroom (Haukås, 2016). This is particularly relevant in the context of minority languages, where the availability of resources is more limited (Behney & Marsden, 2021; Gujord, 2021; Tracy-Ventura et al., 2021).

2. Objectives

Current research focuses on Catalan learners as an additional language from diverse backgrounds to better understand how we can support teachers and multilingual learners. As Catalan is often learned as an additional language (Bach et al., 2021), learners can either learn more rapidly or make mistakes based on their linguistic background (Clua, 2007; Joan Casademont, 2020a, 2020b; Martín Peris et al., 2004). In this paper, we present an overview of the architecture of a project that aims to identify the specific needs of multilingual language learners. This involves considering the linguistic backgrounds of learners and comparing learning paths from different L1 (French and English) speakers in the target language production (Catalan) to create microlearning capsules that foster metalinguistic awareness, which will be available in open access to support the learning process. Teacher feedback and perception are also presented and will be used to enhance the resources.

3. Methodology

We collected texts written by Catalan intermediate (B1) learners with different linguistic backgrounds: L1 French speakers from Belgium, France, and Canada (Québec) (n = 40), and L1 English speakers from the United Kingdom and the United States (n = 52). These written productions were part of a standardized exam administered by the Institut Ramon Llull. Using a qualitative labelling methodology, the corpus was annotated using NVivo and Atlas.ti, providing a comprehensive examination of each error found in each text and examining different perspectives such as linguistic aspects, type of modification, interlinguistic influences, intralinguistic causes, and communicative consequences (see Table 1).

Table 1.
Annotation system of errors and examples

LINGUISTIC ASPECTS (Alexopoulou, 2006; Corder, 1973; Ellis, 1997)

- **Orthographic** (how a word is written): **t'avindras* (*t'avindràs*) (you will accept).
- **Morphological** (word formation, affixes and root word): **sortem* (*sortim*) (we go out).
- **Syntactic** (presence or absence of mandatory elements; sequence in a sentence): **venir visitar-me* (*venir a visitar-me*) (come to visit me).
- **Lexical-semantic** (misuse of a word for a specific meaning; use of a foreign word)*: *família de recepció* (*família d'acollida*) (host family).
- **Cohesion and coherence** (above sentence level, e.g. sequencing of sentences): *Acabo d'arribar a X. *Vaig mudar-me aquí…* (*Acabo d'arribar a X. M'he mudat aquí…*) (I have just arrived in X. I moved here…).
- **Pragmatic** (in discourse; e.g. conventions, implications, innuendos): Formal expression **Ben atentament* (Yours sincerely) in an informal letter or email to a friend.
- **Typographic** (conventions): Unnecessary capital letters.

MODIFICATION TYPES (Alexopoulou, 2006; Fernández Jodar, 2006; James, 1998, 2013)

- **Omission** (a necessary element is missing): *no *tan com ella* (*no tant com ella*) (not as much as her).
- **Overinclusion** (an extra element is present): *et podria presentar *al meu cap* (*et podria presentar el meu cap*) (I could introduce you to my boss).
- **Misselection** (an incorrect element is used): **nadar* (*nedar*) (swim).
- **Misordering** (elements are correct but in the wrong sequence): *m'agradaria *et veure* (*m'agradaria veure't*) (I would like to see you).

INTERLINGUISTIC INFLUENCES (Alexopoulou, 2006; Dulay et al., 1982; Fernández Jodar, 2006; James, 1998, 2013)

- **L1:** **climat* (*clima*) (climate).
- **Other L:** *no he *tingut que pagar* (*no he hagut de pagar*) (I haven't had to pay).
- **L1 and other L:** **communicat* (*comunicat*) (communicated).
- **Multiple other L:** **estic a Londres* (*soc a Londres*) (I am in London).
- **Interlinguistic N.A.:** No possible other language influences are detected during annotation.

INTRALINGUISTIC CAUSES (Alexopoulou, 2006; Dulay et al., 1982; Fernández Jodar, 2006; James, 1998, 2013)

- **Incomplete application of rules** (rules are only partially applied or not applied at all): **nuvols* (*núvols*) (clouds).
- **Non-application of exceptions to rules** (exceptions of rules are not applied): *la *história* (*la història*) (story).
- **False analogy** (applying a rule when it does not apply; incorrect word or expression in a context): *el pis *es queda a la segona planta* (*el pis queda a la segona planta*) (the flat is on the second floor).
- **Intralinguistic N.A.:** No possible interference with what has already been learned in the target language (Catalan) is detected during annotation.

COMMUNICATIVE CONSEQUENCES (Dulay et al., 1982; Gozali, 2018)

- **Causing miscommunication:** *la meva *company de pis* (*la meva companya de pis*) (my roommate).
- **Not causing miscommunication:** *una per dormir i *l'altre (habitació) per* estudiar (*una per dormir i l'altra per estudiar*) (one for sleeping and the other (room) for studying).

Note. Source: (Gagné & Joan Casademont, in press).

Subsequently, statistical analyses of the annotated corpus were conducted using SPSS and SAS to identify the most frequent errors for each L1 group and to understand their etiology. We created the variable LAMT, which combines Language Aspect and Modification Type to target the most frequent language issues. These analyses allowed us to determine what to incorporate into the microlearning capsules to be developed in the subsequent stage.

Previous research results conducted on the LAMT variable for Francophone learners revealed issues with incorrect selections of words at the lexical-semantic, syntactic, and orthographic levels, as well as omissions at the orthographic level (see Joan Casademont et al., 2022 for an extensive review). On the other hand, the analysis of LAMTs for Anglophone learners (Gagné & Joan Casademont, 2023) showed incorrect selections of words in terms of cohesion and coherence, as well as at the lexical-semantic, morphological, and syntactic levels. The next step was then to conduct an analysis to compare the challenges faced by these two types of learners (See Table 2).

Using the most frequent common errors, we created microlearning capsules. To develop the capsules, we went through the corpus to identify examples of the most frequent errors and provided explicit instruction on the targeted structures, along with comparisons to the L1 to support metalinguistic awareness. Microlearning is considered an effective reinforcement method to support learning (Hug, 2007; Leong et al., 2021; Torgerson & Iannone, 2020). Based on the model Form-Meaning-Use, the capsules consist of tasks addressing specific grammatical or lexical needs (Larsen-Freeman et al., 2015). Capsules also provide automatic corrective feedback (Angelovska, 2018; Festman, 2021; Huang et al., 2020; Jessner, 2008; Roehr-Brackin, 2018; Sharwood Smith, 2017; Trimasse, 2019). Automatic feedback was chosen due to its demonstrated effectiveness compared to simple correction (indicating correct or incorrect answers) as it promotes learning and prevents the internalization of errors (Bovolenta & Marsden, 2021; Ferris & Kurzer, 2019; Potts et al., 2019).

The capsules' content uses explicit teaching principles to enhance the learner's ability to use this knowledge to reflect on the production in the target language. Consequently, explicit teaching may contribute to the development of metalinguistic awareness, a skill that helps individuals learn other languages in diverse contexts and promotes improvement in language proficiency (Hyland, 2022; Nassaji & Kartchava, 2021; Roehr-Brackin, 2018).The capsules are designed to facilitate learning through activities that address identified learning needs and present a gradual increase in difficulty and complexity. Initially, learners apply prior knowledge using everyday lexical items in straightforward tasks, focusing on a single aspect, drawing from examples and contextual models. Activities then progress in complexity, aiming for learners to integrate their learning into meaningful contexts. Employing two types

of scaffolding as identified by Bradley & Bradley (2004) and based on Bruner's 1978 framework (Bruner, 1978), the capsules offer simplification (avoiding complex language and idioms) and progression from simple to complex activities, ensuring that learners are guided progressively toward autonomous use. Finally, previous results have shown that negative transfer from the L1 and/or L2 could occur in the L3, which aligns with the Typological Primacy Model (Rothman, 2010, 2011, 2013, 2015). This model suggests that learners' minds unconsciously determine proximity based on linguistic clues and that structural proximity between the target language and the L1 and/or L2 may impact L3 transfer. Therefore, we included links between the previously known languages and the target language to raise metalinguistic awareness in an attempt to avoid negative transfer.

The capsules were made available for testing in collaboration with teachers. After providing the students with capsules, we wanted to explore their effectiveness regarding uptake and students' and teachers' perceptions. This phase was conducted using both scores from a pre- and post-test as well as a questionnaire. In addition to engaging with the capsules, learners completed a questionnaire covering three aspects: their perception of the micro-learning capsules, their views on the topics covered, and their self-assessment of competence, including their proficiency in their other languages and their use of these languages in daily life. Analyses of participant results and feedback surveys were conducted using correlation matrices.

A previous study assessed the effectiveness of this type of microlearning capsule for learners. Results have shown that the use of microlearning resources led to a 5.16% improvement in grades after using the capsules (Joan Casademont et al., 2023), measured by a Student's t-test: ($t(14) = 1.95$, *p (unilateral)* = 0.03; n=15). Participants were English L1 learners of Catalan (n = 15) who took a pretest of 40 questions about *ser* and *estar* (*to be*), experimented with the learning capsules created within the research framework, and then responded to the survey. Ten days later, they completed the 40-question exam again. The majority of participants found the exercises useful (completely agree (8), strongly agree (5), somewhat agree (2)). Results also revealed that the two participants who reported lower scores in terms of usefulness achieved higher results in both the pre-test and post-test.

For the project's current phase, surveys were also conducted with teachers to understand the resources typically used in their teaching (material) and to gather their perceptions of the effectiveness of the microlearning capsules. All surveys were administered using Lime Survey, enabling us to improve the microlearning exercises provided to teachers before a wider online implementation.

4. Results

Table 2 presents the analyses comparing the overall performance of Francophones and Anglophones and shows that the distribution of errors differs significantly between the two groups according to the L1 (p < .001). However, this difference is not significant when the LAMT is analyzed separately. We then wanted to explore the types of LAMT that seemed to cause more miscommunication.

Table 2.

Number of Errors and % by L1 (LAMT Causing Miscommunication)

	L1 = FRENCH		L1 = ENGLISH		Total
Causing miscommunication	**n**	**%**	**n**	**%**	
Cohesive and Coherence Misselections	41	15.41	74	15.88	115
Lexical-Semantic Misselections	76	28.57	102	21.89	178
Morphological Misselections	47	17.67	46	9.87	93

Note. Others: *n* = 346 (L1 French = 38.35%; L1 English = 52.36%).

A multinomial regression by GEE using only the errors causing miscommunication allowed us to see a significant difference between the two groups ($p < .001$). However, no group effect is significant if the analyses are conducted using the error type. The most frequent errors among the LAMT categories are lexical-semantic misselections. For this error type, both groups (Francophone and Anglophone learners) display a similar proportion of errors (5.5% vs 6.5%, respectively; p = 0.466).

Table 3 shows more details about these errors and gives more information for each LAMT associated with lexical-semantic misselection in order to understand the specific errors of each group of learners.

Table 3.

Lexical-semantic Misselections Causing Miscommunication: Examples

Lexical-Semantic Misselections Causing Miscommunication	**False analogy**	French L1 speakers	L1 and other Romance languages (Spanish, etc.)	*Anirem a visitar el palau **real**. (2009-01-CA-MON-02-001)* (We will visit the royal palace).
		English L1 speakers	Other L (Spanish, French and other Romance languages)	*Podriem anar a les montanyes junts i passar un **par** de dies esquiant a Escòcia, vine ja! (2015-01-GB-LON-02-002)* (We could go to the mountains together and spend a couple of days skiing in Scotland. Come now!).
	Incomplete application of rules	French L1 speakers & English L1 speakers	Influenced by L1 and sometimes also Other L (Spanish or other Romance languages)	*Jo ja no visc a Catalunya, ni a Espanya tampoc, arà **estic** a Alemnya, amb la meva xicota. (2015-01-FR-PAR-02-001)* (I no longer live in Catalonia or Spain; I now live in Germany with my girlfriend.)
				*Fa tres mesos, més o menys, **estava** a un bar amb els nens, (2015-01-GB-LEE-02-002)* (Three months ago, I was in a bar with the children,).

Results highlight some patterns that align with previous research findings indicating that learners' knowledge of other languages may positively or negatively affect their language learning, such as the Typological Primacy Model (TPM) proposed by Rothman (2010, 2011, 2013, 2015). This model suggests that at the B1 level, crosslinguistic influence (CLI) is shaped by the learners' background language, which their internal mechanisms perceive to be most similar to the target language (Rothman, 2010: 246). According to this model, transfer

will occur from the closest language in terms of typological proximity. False analogies are great examples of errors influenced by other Romance languages to illustrate the current results. Whether it is the learner's first language or not, learners use cognates or words that do not exist in the target language or that are based on another Romance language. Also, regarding instances where an incomplete application of rules causes errors, we can use the example of *ser* and estar (both referring to the verb "to be" in English). As a result, the TPM model also supported the creation of the capsules. For example, we used cognates to enhance the comparison between the languages and support metalinguistic awareness.

Twenty teachers responded to a survey regarding the use and effectiveness of microcapsules and the material used in class in multilingual settings. They all teach Catalan as a foreign language abroad, in adult settings, at more than one level (mainly from A1 to B2 levels), and have been teaching for 5 to 20 years. Interestingly, among these teachers, most report they have to create (14 out of 20), adjust (18 out of 20), or complete (16 out of 20) existing material. Half of them report a lack of variety in the existing material or how the material does not consider their learners' heterogeneity.

Results related to the microlearning capsules show that teachers seem to consider that interlinguistic influences (previous linguistic backgrounds) are mainly positive for students' learning (completely agree (5) and agree (8), neutral (4)).

5. Implications

The analyses demonstrate the existence of various interlinguistic influences (725 of the 1591 errors analyzed are considered to be a consequence of other language influences), sometimes leading to accurate predictions in the target languages and sometimes not. As false analogies and incomplete application of rules are associated with the majority of errors causing miscommunication in the corpus, current results seem to align with the general tenets of the TPM model. This model suggests that in the initial stages of L3 acquisition, learners may rely on their L1 and/or L2 to produce (accurately or not) the target language. The results also highlight the need for more research on the impact of the proficiency level acquired in other languages learners possess to see if the level in the other languages known could affect the nature of transfer in the L3. Results suggest that it would be beneficial for learners to develop their metalinguistic knowledge and explicitly establish connections between the knowledge they possess and the target language. Previous research has shown that this could potentially improve their learning (Cook & Han, 2007; Herdina & Jessner, 2002; Kerz & Wiechmann, 2021; Orcasitas-Vicandi, 2019).

Previous results have also shown that students acknowledge that the other languages they know influence their learning of Catalan as an additional language (Joan Casademont et al., 2023). Learners, however, tend to perceive positive influences more readily than negative influences from the other languages they know. Once again, better metalinguistic awareness could benefit all learners and approaches, and considering previously learned languages in learning seems to be an interesting avenue to explore. In terms of classroom implications, the findings can inform Catalan teachers in various ways. First, as many language teachers promote the exclusive use of the target language in the classroom and communicative approaches, results suggest that other languages cause learners to make false analogies based on their L1 (and other languages they know and perceive to be close to Catalan). Comparing languages can help students make more effective connections and predictions in the target language. Given that most groups are heterogeneous, it might be challenging for teachers to consider all the languages known by their learners. Microlearning might be a good way to support learning in this context. By providing just-in-time capsules to support learners and

personalizing their learning paths, teachers can give their learners the resources they need when they need them. This approach also has the advantage of making more effective use of class time. Teachers can use a placement test to offer students only the capsules they require and grant access to the capsules based on the students' results from the placement test. Alongside our research and recognition of the necessity for enhanced language learning accessibility for all learners, the dissemination of the tools created marks the next step. This involves sharing the microlearning capsules and their exercises for free through a community of practice, such as H5P.cat (Viladrich Castellanas, 2021). Following an ecological perspective, the project strengthens the links between theoretical and practical research. It also offers Catalan teachers and students from different linguistic backgrounds access to applied material from research, thereby encouraging the empowerment of both Catalan teachers and learners (Joan Casademont et al., 2022).

6. Conclusion

The current project sheds light on how microlearning based on common needs can support the learning and teaching of multilingual learners. Spada (2019) emphasized the importance of striking a balance between the quality of research results (with experimental control) and their application in natural contexts (ecological validity). Creating microlearning resources on specific topics targeting frequent errors in an accessible manner should enable teacher, especially in the case of minority languages, to propose more personalized reinforcement tasks to their students when appropriate.

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