

Welcome to the Jungle: An Empirical Study on Teaching Listening Through Songs

**Welcome to the Jungle: un estudio empírico sobre la
enseñanza de destrezas auditivas mediante canciones**

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Resumen: La comprensión auditiva es una de las destrezas más difíciles de desarrollar en una lengua extranjera, y sin embargo la práctica docente suele centrarse más en evaluar que en entrenar esta habilidad. El presente estudio analiza si una actividad de aprendizaje reflexivo basada en letras de canciones puede favorecer la decodificación auditiva, en particular la segmentación de palabras, en estudiantes de italiano como lengua extranjera. Noventa y siete estudiantes malteses de 1.º y 2.º curso de secundaria participaron en el estudio siguiendo una de tres condiciones de instrucción: canciones pop con música, versiones habladas de las mismas letras sin música o enseñanza tradicional. Todos los participantes realizaron pruebas pre- y post-tratamiento mediante mini-dictados centrados en la segmentación. Ambos grupos experimentales mostraron mejoras significativas, mientras que no se observaron progresos en el grupo de control (enseñanza tradicional). La música no produjo una ventaja significativa en general, aunque los resultados descriptivos sugieren que los alumnos más jóvenes podrían beneficiarse especialmente de las canciones. Estos resultados aportan evidencia preliminar de que las actividades de comprensión auditiva basadas en aprendizaje reflexivo y con materiales auténticos pueden potenciar la decodificación inicial y complementar la enseñanza de la comprensión auditiva.

Palabras clave: decodificación; comprensión auditiva; aprendizaje reflexivo; música; materiales auténticos.

Abstract: Listening is one of the most challenging foreign language skills to develop, yet classroom practice often prioritises testing rather than training. This study investigates whether an inquiry-based activity using song lyrics can support aural decoding, and specifically word segmentation, in learners of Italian as a foreign language. Ninety-seven Maltese students in Years 7–8 were assigned to one of three conditions: pop songs with music, spoken renditions of the same lyrics without music, or a control group following regular instruction. Participants completed pre- and post-tests based on mini-dictations targeting segmentation. Both treatment groups showed significant improvement, while no gains were observed in the control group. Music did not yield a significant advantage overall, although descriptive results suggest younger learners (Year 7) may benefit slightly more from songs. These findings provide preliminary evidence that inquiry-based listening activities using authentic materials can enhance early decoding skills and offer a valuable complement to instruction.

Keywords: decoding; listening skills; inquiry-based learning; music; authentic materials.

I

ntroduction

Listening has long been regarded as one of the most challenging skills to acquire in a foreign language (FL) (Vandergrift, 2007). The difficulty stems largely from the fleeting nature of aural input, which can trigger a negative emotional reaction (Zhang & Shen, 2022). Consequently, learners often experience reduced motivation and confidence (Graham, 2006), reinforcing the perception of listening as a demanding skill. Goh (2000) found that learners frequently attributed their difficulties to perceptual limitations, such as failing to recognise familiar words, losing track of incoming speech while processing previous segments, or difficulty distinguishing word boundaries, indicating that students themselves perceive aural decoding as an area requiring further development.

This study examines aural decoding in FL listening, and specifically in Italian as FL, through an inquiry-based activity using song lyrics to develop decoding skills. Although researchers agree on

the value of listening instruction (Field, 2008), empirical studies focusing on aural decoding, particularly on segmentation, remain scarce (Chobert & Besson, 2013; Leonard, 2019). One possible practical reason is that FL classroom practice still tends to prioritise testing over teaching (Field, 1998; Goh, 2008; Kaur, 2017), while strengthening learners' linguistic processing may have broader benefits for comprehension, as suggested by Karalık and Merç (2025), who conceptualise listening as the interplay of linguistic, cognitive, and affective components.

Previous studies show that music can reduce affective filters such as anxiety and foster engagement (Degrave, 2019; Dolean, 2016), though others caution that it may increase the cognitive load during speech processing (Racette & Peretz, 2007). Moreover, Hamilton et al. (2024) note that stronger empirical designs are needed to verify music's benefits in FL learning. The present study contributes to the under-researched area of aural decoding in second language listening (Leonard, 2019) by providing empirical evidence through an inquiry-based activity to enhance segmentation skills. Unlike Leonard's (2019) focus on comprehension, this study isolates decoding as its core focus. To our knowledge, no previous research has explored an inquiry-based approach using lyrics to target aural decoding in young FL learners.

1. Theoretical background

It is important to note that the theoretical literature reviewed in the sections that follow draws largely on research conducted with English as a second language (L2). While this reflects the predominance of English in SLA research, the cognitive processes underlying L2 aural decoding, and segmentation in particular, are not language-specific and have been shown to operate across different languages (Chobert & Besson, 2013; Leonard, 2019). The principles discussed here are therefore considered applicable to Italian, which is the target language examined in this study.

Following the convention widely adopted in the SLA literature (e.g., Vandergrift, 2007), L2 is used throughout this paper as a broad umbrella term referring to any language acquired after the L1, particularly when discussing cognitive processes and skills (e.g., L2 listening, L2 decoding) that apply across second and additional language contexts. FL (foreign language) is used when referring to the instructional context, characterized by limited target language exposure outside the classroom, and to learners and learning environments (e.g., FL learners, FL classroom, Italian as FL). This terminological distinction maintains consistency with established SLA research while acknowledging the specific pedagogical setting of this study.

1. 1. *Listening as a unique skill*

Despite its distinctive features, FL listening has often been treated as comparable to the other skills (Cauldwell, 2018) and reading in particular, because both aim at “comprehension” (Field, 2008). Yet, while both involve understanding a message, the cognitive processes involved differ substantially. First and foremost, the mentioned intrinsic transient nature of listening (Zhang & Shen, 2022) poses unique cognitive and affective challenges, absent in reading. From a cognitive point of view, learners have to rely heavily on narrow memory capacity, as they cannot revisit the message once the audio ends, a challenge noted by participants in Goh’s (2000) study, who struggled to remember what was heard. Moreover, in reading, the message is already divided into words by blank spaces, while segmenting the aural message is a key decoding skill that Vandergrift (2007) pins as one of the main deficiencies leading to poor FL listening skills. Goh (2000) found that half of the listening challenges in a group of Chinese learners of English stemmed from segmentation issues. Poor FL segmenting skills might also explain one of the most often mentioned problems when it comes to listening, which is the perception that the speed rate of the FL audio is too fast (Cutler, 2012; Renandya & Farrell, 2011). This specific issue has also been referred to as the “Gabbling Foreigner Illusion” and Cutler (2012) contends

that this perception arises more from the listener's limited proficiency than from the actual rate of speech.

In L2 listening, decoding refers to the overall bottom-up process of transforming the speech signal into recognisable linguistic units, while segmentation represents one of its core components, involving the “ability to distinguish word boundaries” (Field, 2008, p. 101) in the continuous flow of speech. Drawing on Richards’ (1983) taxonomy of micro-skills required for general listening expertise, Field positions segmentation as an essential sub-skill for successful decoding and comprehension. Two main types of processes underlie L2 listening: top-down and bottom-up. The former involves drawing on contextual cues and background knowledge, whereas the latter relies on linguistic knowledge (Conti & Smith, 2019; Vandergrift, 2007). While foundational, these concepts remain influential. For example, Martín del Pozo (2017) draws on Richards’ (1983) microskills and frames L2 listening as an interaction of top-down and bottom-up processing to argue that English instructors should explicitly focus on developing listening skills as well, by learning lecture conventions.

Leonard (2019) explored the link between aural decoding and L2 listening comprehension, emphasising the central role of bottom-up processing. She found that comprehension problems often stem from difficulties in recognising words, segmenting speech, and managing its speed. While top-down strategies help, they cannot compensate for weak decoding. Leonard calls for decoding-focused instruction to strengthen segmentation and word recognition, thereby improving overall comprehension.

1. 2. Inquiry-based teaching and learning

Inquiry-based learning (IBL) is both a cognitive framework and a teaching method encouraging a shift from traditional lecturing to interactive, student-centred learning (Lee, 2014). Central to IBL is the use of questioning, consciously involving students in the learning

process, fostering skill development and metacognitive awareness (Caputo, 2014). Rooted in constructivist theories such as Vygotsky's (1986), IBL views learning as an active, social process of knowledge construction.

Lee (2014) argues that IBL shares principles of prominent language teaching approaches such as Communicative Language Teaching (CLT) and Task-Based Instruction (TBI), since it also introduces questions in a meaningful context with a natural flow and implies an active role by the learner. Originally developed for disciplines such as Mathematics and Science (Lee, 2014), the IBL approach remains most widely implemented in these areas, as highlighted by Dobber et al. (2017). However, it can also be applied in the FL classroom (Lee, 2014), depending on the type of IBL route chosen. Banchi and Bell (2008, p. 27) identified four different levels of inquiry, ranging from maximum to minimum teacher guidance: *confirmation*, *structured*, *guided* and *open*. *Confirmation* inquiry is when, through an activity with known results, students verify a principle given by the instructor. *Structured* inquiry is when students investigate a question given by the teacher using a defined procedure, while in the *guided* one, pupils get to decide the process to choose to address the issue. In the case of *open* inquiry, the students are free to select both the question and the method to answer it. In FL contexts, complete autonomy may be unrealistic given learners' linguistic limitations; thus, *structured* or *guided* inquiry tends to offer an optimal balance (Caputo, 2014).

Across all levels of IBL, there is an emphasis on shifting the teacher's role to that of a "facilitator" (Lee, 2014), a concept that was also highlighted by Field (2008) to describe the function of the educator during FL listening activities within a skills-based approach. Both scholars advocate for the teacher to be a guide rather than an instructor. This focus on facilitation links IBL with a skills-based approach to listening, as explored by Field (2008) and Goh (2000), since both methods also prioritise the learning process over the final product. Goh (2008) notes that classroom listening activities often

involve simple correction of exercises, while a diagnostic perspective, as suggested by Goh (2000), would shift the focus from listening outcomes to the underlying process (Field, 1998; Vandergrift, 2007), respecting the “tentative” nature of listening (Field, 2008). Similarly, IBL encourages students to form hypotheses and test them through trial and error, rather than being evaluated on a final result.

1. 3. *Pop songs as authentic materials*

Pop songs are widely used in FL classrooms (Pavia et al., 2019) and are valued for lowering anxiety and fostering a positive atmosphere (Degrave, 2019; Dolean, 2016). Beyond affective benefits, Degrave (2019) notes that music’s diverse classroom uses (background music, songs or rhythmic activities) enhance both linguistic and non-linguistic learning. Moreover, songs can be considered authentic materials, whose role is considered useful in the development of FL listening skills (Field, 1998; Kaur, 2017) and their lyrics can be considered as literary texts, comparable to poetry (Astori, 2024). Likewise, Toscano Fuentes and Julián de Vega (2018) demonstrated that the use of music videos in primary English classes had a positive impact on reading fluency and decoding skills, suggesting that music-based activities can support bottom-up processing in FL learners.

Sun et al. (2024) reviewed studies from 2002 to 2022 to determine how music and songs promote FL learning. The authors report that although teachers often believe in its benefits, researchers (Shahriari et al., 2019) and learners (Tsang & Paran, 2021) have questioned its effectiveness. In general, research on songs has focused on vocabulary learning (Mannarelli & Serrano, 2024; Odo, 2022; Werner, 2021). However, there are some studies that have also examined how songs contribute to the development of listening skills, with some conflicting findings. For instance, Schön et al. (2008) analysed how participants listened to a continuous sequence of syllables and broke it down into words or part-words from a made-up language and found that music aided segmentation skills in early

language learning. Results showed that when syllables were constantly associated with a tone, it was easier for learners to segment speech. In contrast, Racette and Peretz (2007) found that multimodal input with music hindered verbal recall instead of boosting it, due to an increased processing load. The different results reported in the literature might be due to the methodology employed in the studies. Hamilton et al.'s (2024) review suggests that, among the articles examining the impact of music on listening skills, only two employed sound designs, and neither found any advantage in using songs over recorded speech. More recently, Pitychoutis et al. (2026), in a mini-review of empirical ELT studies published between 2020 and 2025, identified three main mechanisms through which music supports FL learning: affective regulation, rhythmic-prosodic entrainment, and memory enhancement through lyric repetition and retrieval. Vocabulary interventions showed the most consistent benefits, particularly when lyric exposure was combined with structured retrieval practice, which is consistent with the chorus-reconstruction approach adopted in the present study.

As for pop songs in particular, Murphey (1992) found that their discourse is simple and repetitive, which is ideal for memory recall, a concept supported by the song-stuck-in-my-head phenomenon (Murphey, 1990). Pop songs were selected over other musical genres for several interconnected reasons. First, their discourse structure (Murphey, 1992) and predictable verse-chorus format make them particularly well suited to a chorus-reconstruction activity targeting segmentation, since the repeated exposure to the same phonological material across the chorus facilitates bottom-up processing (Schön et al., 2008). This is further supported by Larroque (2025), who demonstrated that pop songs and spoken language share fundamental prosodic and rhythmic structures, including stress patterns, intonation, and timing, suggesting that exposure to pop song lyrics may help FL learners internalise the rhythmic properties of the target language and thereby support segmentation. Second, pop songs represent the genre most widely used and researched in FL classrooms (Pavia et al., 2019; Sun et al., 2024), making the findings of this study more directly comparable to the existing literature. Third, Italian pop music provided

relevant authentic input in the target language, precisely the kind of real-world "jungle" speech that Cauldwell (2018) argues learners must be trained to process. Finally, pop songs are generally familiar and motivating for secondary school-aged learners, which helps reduce the affective barriers associated with FL listening (Degrave, 2019; Dolean, 2016).

Nevertheless, teachers seldom use pop songs systematically (Emerick, 2019), often preferring recorded speech. Pérez Aldeguer and Leganés Lavall (2011), in a qualitative analysis of music use in primary English textbooks, found that music is underrepresented in instructional materials, which may partly explain why teachers lack a clear theoretical basis for integrating songs consistently. Degrave (2019) attributes this to difficulty finding suitable materials (Engh, 2013; Tegge, 2018) and the lack of a strong theoretical basis, while teachers remain cautious about using authentic input with beginners (Emerick, 2019). Martín del Pozo (2017) also highlights the issue of authenticity in listening materials even at university level.

This detachment between classroom practice and everyday life was explicitly theorised in Cauldwell's Botanic Metaphor (2018), where the author describes three listening conditions: the *greenhouse*, the *garden* and the *jungle*. The *greenhouse* is uncommon in everyday spoken language and refers to listening to a word on its own, in its citation form, while the *garden* is the type of language found in textbook materials or slow speech, where listeners deal with phrases and sentences. Finally, the *jungle* is "the domain of fast, unruly and messy speech" (Cauldwell, 2018, p. 13). These three circumstances also reflect a different relationship between what the person hears and how such a message is spelt in writing. If in the *greenhouse* there is a direct connection between the two forms, in the *jungle* such association is not as easily made.

2. The present study: aims, research questions and hypotheses

The present study seeks to address the research gap in aural decoding within L2 listening by empirically examining how a focus on segmentation skills can support language processing. At a broader level, the literature points to three interconnected challenges that have shaped both research and pedagogy in this field: the limited use of authentic listening materials, an emphasis on outcomes rather than processes, and a tendency to frame listening primarily through comprehension-oriented approaches borrowed from reading research.

In response, this study explores the impact of a process-oriented approach that prioritises the development of L2 decoding skills over comprehension outcomes, thereby helping to bridge the persistent divide between theoretical research and classroom practice. Decoding, and segmentation in particular, was selected as the focal skill because it reflects one of the key distinctions between listening and reading: in spoken language, word boundaries are not explicitly marked. By directing learners' attention to the processes underlying speech segmentation, this study aims to promote listening as an active, trainable skill within an IBL framework rather than as a passive test of comprehension. In particular, it examines the effect of an inquiry-based task with an authentic material such as pop song lyrics on FL learners either in their first or in their second year of approaching the target language.

Considering how students typically deal with heavily modified materials in FL listening activities (Cauldwell, 2018), we checked for differences between Year 7 and Year 8 cohorts to examine whether an additional year of exposure to the language impacts their ability to manage authentic materials. This distinction allows us to assess the progression in listening decoding skills and to determine the earliest point at which authentic input can be introduced without hindering learning. This research has important pedagogical applications and at the same time it contributes to the educational debate on the acquisition of FL listening skills in instructed settings.

Specifically, our goal is to answer the following research questions:

1. Can a guided inquiry-based activity with song lyrics effectively develop L2 decoding skills in the case of FL secondary school learners?
2. Does the presence of music enhance L2 decoding skills in this FL context?
3. Are there differences between Year 7 and Year 8 students?

Based on the literature reviewed, we formulate the following hypotheses. First, we expect that an inquiry-based activity with song lyrics will be beneficial for the learners, given the evidence supporting focused listening instruction (Field, 1998; Leonard, 2019). Second, we hypothesise that songs will lead to more significant learning gains, as musical support has been linked to enhanced segmentation in early language learning (Schön et al., 2008), although we acknowledge that the evidence on this point is mixed (Hamilton et al., 2024; Racette & Peretz, 2007). Third, we expect Year 8 students to demonstrate stronger baseline decoding ability than Year 7 students due to an additional year of exposure, though we make no directional prediction regarding differential responsiveness to the treatment across year groups.

3. Methodology

3.1. *Participants*

This study was set in a private comprehensive school in Malta and included FL learners of Italian in Year 7 and 8 classes (11-13 years old). In both the British educational system and the Maltese system, which follows a similar structure, secondary education is divided into year groups numbered sequentially. Years 7 and 8 correspond to the first two years of secondary school, with students aged 11–12 and 12–13 respectively (Eurydice, 2024). The official

languages in Malta are English (Indo-European) and Maltese (Afro-Asiatic Semitic). In strict acquisitional terms, Italian represented a third language for these learners, who came from diverse bilingual backgrounds reflecting Malta's Maltese-English bilingualism, with varying degrees of proficiency in both languages, and limited exposure to Italian outside the classroom. In the 1970s and 1980s, Maltese students were highly fluent in Italian before formal schooling, largely due to the island's proximity to Italy and the popularity of Italian television (Caruana, 2013). However, this trend has declined. Despite this shift, Italian remains the most popular FL choice among secondary school students (Caruana, 2013), with instruction typically starting in Year 7. Participants received three 40-minute lessons of Italian per week.

Six intact classes participated in the study (three in Year 7 and three in Year 8) each of them randomly assigned to experimental or control conditions. Year 7 students were in their first year of learning Italian, whereas Year 8 students were in their second. The initial sample included 115 students, but 18 of them were excluded for absences, leaving 97 participants: 52 students in Year 7 (24 boys and 28 girls), and 45 in Year 8 (17 boys and 28 girls). Parental and participant consent was obtained prior to data collection. Permission to conduct the study in the school was granted by the headteacher and senior management team. Furthermore, the study received a favourable report from the Ethics Committee of the Universitat de Barcelona. All procedures complied with the ethical standards established by the institution for research involving minors.

3. 2. *Treatment*

The study followed a pre-test/treatment/post-test design. During the week prior to treatment, all participants completed proficiency tests and a mini-dictation pre-test. The following week, the two experimental groups received three treatment sessions, after which the post-test was administered. The control group completed only the tests, following their regular Italian lessons throughout.

The study focused on developing a specific decoding sub-skill (word segmentation) while listening to Italian as a FL. The treatment, administered by the first author and another Italian teacher during regular Italian lessons, lasted three sessions, in line with school restrictions on non-curricular activities. Two experimental groups were considered: one listened to songs (song group), with 27 participants (15 in Year 7, 12 in Year 8) and another listened to a recorded speech version of the same song lyrics but without music (speech group), which included 28 participants (15 in Year 7, 13 in Year 8). Thus, both conditions used identical content, allowing isolation of the music variable. Additionally, there was a control group with 42 participants (22 in Year 7, 20 in Year 8) who only performed the tests, so as to analyse the effectiveness of the treatment itself. Table 1 outlines how participants were split into groups according to their condition.

Table 1

Distribution of participants across conditions

	Year 7 (11-12 years old)			Year 8 (12-13 years old)			TOTAL
	Girls	Boys	Total	Girls	Boys	Total	
Speech	8	7	15	7	6	13	28
Song	10	5	15	8	4	12	27
Control	10	12	22	13	7	20	42

Source: self produced

Students listened to the lyrics of three Italian pop songs, one per session (with or without music, depending on the condition) for three times and collaboratively reconstructed the chorus, an activity aimed at working on listening skills through music (Arnold & Herrick, 2017). The activity emphasised decoding over understanding the message (Cauldwell, 2018) and is an example of *guided* IBL, since the students could choose the method to complete the task and the main focus was on their processing. Moreover, discussing in a group the streamlining typical of authentic speech and songs also emphasised listening as a process rather than as a product (Goh, 2000). As for the groups who went through treatment without music, we referred to the concept described in Astori (2024) that the lyrics of a song can be

considered a poetic text to be used in the FL classroom even in absence of music. Therefore, the students in the speech group were still exposed to a literary authentic material presented by a native speaker and they still had to identify the chorus, the repeated part. Contrariwise, the control groups followed their regular lesson plan, which only involved listening in the form of correction of exercises from the textbook *Progetto Italiano I* (Marin & Magnelli, 2010).

The lesson plan was focused on the activity described above and one of its goals was for the teacher to be less and less the centre of the lesson and act more as a “facilitator”, as suggested by Field (2008) and the IBL approach (Lee, 2014). Specifically, the teacher would play the audio for the first time and the students had to try and jot down what they thought they heard in the chorus. After that, they would start sharing with the teacher and their classmates what they thought they heard and their hypotheses would be written on the board by the instructor. This procedure would be repeated twice, at which point the chorus would be mostly reconstructed and the whole class would listen to the chorus one last time to check the correspondence between what was heard and what was written. The following two sessions would follow the same lesson plan. Therefore, the teacher’s role during the three sessions would only be to play the audio and gather the students’ ideas about which words they heard.

The selected pop songs were *Torna a Casa* by Måneskin (pop ballad; 3:50 duration; 2018), *Cornici Bianche* by MyDrama (electronic pop; 2:50 duration; 2020) and *Hanno Ucciso l’Uomo Ragno* by 883 (classic pop; duration 4:12; 1992). Such tracks were chosen because they provided different types of pop songs and the chorus was repeated four times in all of them. Recorded speech tracks were produced by native speakers reading the same lyrics aloud.

3. 3. Tests and procedure

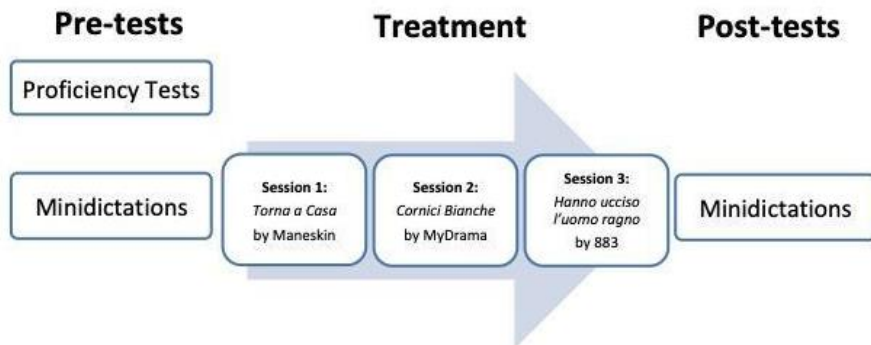
As Thorn (2009) and Cauldwell (2018) suggest, mini-dictations efficiently assess decoding skills, without tapping into memory capacity or comprehension. The standardised audio came from the dictation section of the May 2012 CILS (*Certificazione di Italiano come Lingua Straniera*) B1 exam. Students first listened to part of the track to familiarise themselves with the voice, the tone and the speed of the audio, then heard five short excerpts and transcribed the last five words of each. The test included both mid-sentence and sentence-final segments. The same recording was used for pre- and post-tests, but with different excerpts. Each excerpt lasted 6–12 seconds, and the entire test took less than 10 minutes.

In order to control for their proficiency, participants completed the Vocabulary Size Placement Test (VSPT) for Italian from the University of Lancaster's Dialang website (Zhang & Thompson, 2004), which includes 75 lexical judgement items. Twenty-five items from the Dialang vocabulary section were also added, featuring multiple-choice and fill-in-the-blank tasks. Furthermore, to ensure group comparability in terms of proficiency, we ran two Kruskal-Wallis tests (due to distribution of data not being normal), with the results from the Dialang proficiency tests that confirmed that there were no significant differences amongst the control group and the treatment ones: $H(2) = .734$, $p = .693$ for the VSPT and $H(2) = .989$, $p = .610$ for the vocabulary part.

The week before treatment, all participants completed the proficiency tests and mini-dictation pre-test. The following week, half began treatment with original songs and half with recorded speech. After the three sessions, the post-test was administered in class. The procedure of the data collection is summarised in Figure 1.

Figure 1

Summary of tests and treatment procedure



Source: self produced

4. Analyses

The mini-dictation test had 25 target items overall for both pre-test and post-test, since it required students to transcribe the last five words they heard for each of the five excerpts. Spelling was not considered, thus *architeti* instead of *architetti* or *d'accorsa* instead of *da corsa* were still coded as 1. Gains were calculated by subtracting pre-test scores from post-test ones, then dividing by the maximum number of items the students can be tested on, minus pre-test results and multiplying by 100 to obtain relative gains.

Statistical analyses were carried out using SPSS v25 (IBM 2017). Due to the non-normal distribution of data, we ran a Generalised Linear Mixed Models (GLMMs) with Poisson distribution and Link function identity. Time was the repeated measure, with the mini-dictation results as target, while Time (pre-test and post-test), Year-Group (Year 7 and Year 8), Modality (with music or without music), their paired interactions and the three-way interaction Time*Modality*Year-Group were fixed effects. The variable Year-Group was added in the models to examine potential interactions with our target variables and whether the years of studying the language had an impact on the effectiveness of treatment.

5. Results

Table 2 displays the descriptive statistics for the control group and the two treatment groups (speech and song) in the mini-dictation test. Such results show little improvement by the control group, who had outperformed the other groups at pre-test time. Although the control group showed a slightly higher mean score, this difference may be a consequence of random group assignment, as the proficiency statistical tests reported above indicated that the differences were not significant, which suggests that the groups were comparable at baseline. On the contrary, the treatment groups attained similar, albeit modest, learning gains. As mentioned in the analyses section, we computed raw gains as well as relative gains considering pre-test scores.

Table 2

Descriptive statistics for different modality conditions (means and SDs in parentheses)

	Pre-test /25	Post-test /25	Gains	Relative Gains
Control Group	3.43 (.429)	3.50 (.284)	0.07 (0.51)	0.32%
Speech	2.36 (.292)	5.46 (.700)	3.1 (0.75)	13.69%
Song	2.22 (.421)	5.48 (.566)	3.26 (0.71)	14.31%

Source: self produced

The GLMM results appear in Table 3.

Table 3*Summary of main effects on decoding skills*

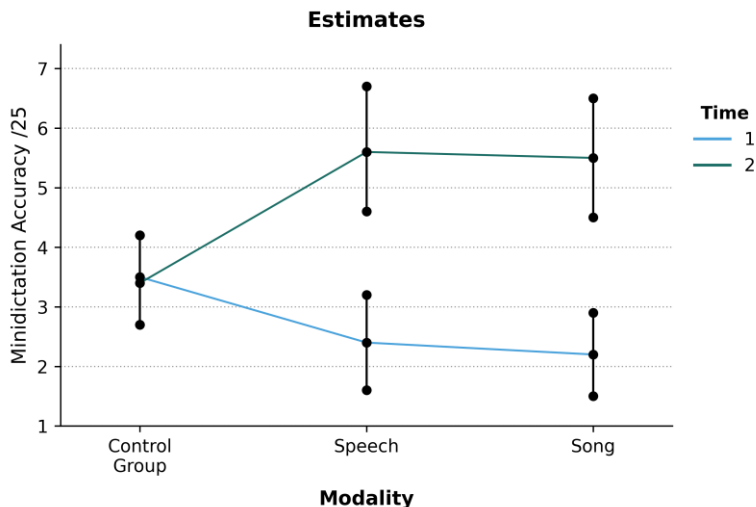
Source	<i>F</i>	df1	df2	<i>p</i>
Time	40.136	1	182	< .001
Modality	.894	2	182	.411
Year-Group	7.967	1	182	.005
Time*Modality	11.535	2	182	< .001
Time*Year-Group	2.008	1	182	.158
Modality*Year-Group	10.292	1	182	< .001
Time*Modality*Year-Group	8.008	4	182	<.001

Source: self produced

The results show a significant effect of Time [$F(1, 182) = 40.136, p < .001$] and pairwise comparisons indicate that pre-test was significantly lower than post-test [$t(2) = 2.195, p < .001$]. This confirms that decoding performance improved across the study. Moreover, both experimental groups outperformed the control group at post-test, while the control group showed no significant change (see Appendix A, Table A.2 for the pairwise comparisons). In answer to RQ1, these results suggest that the inquiry-based treatments (whether with spoken or sung lyrics) were effective in developing learners' decoding skills.

To explore whether musical support further improved performance (RQ2), post-test and gain scores were compared between the two treatment conditions. According to the descriptive statistics, the song group obtained slightly higher post-test scores ($M = 5.48$) and relative gains (14.31%) than the speech group ($M = 5.46$; 13.69%), but this difference was not statistically significant [$F(2, 182) = .894, p = .411$]. The GLMM results confirmed the absence of a significant main effect of Modality, yet revealed a significant Time*Modality interaction [$F(2, 182) = 11.535, p < .001$]. As shown in Figure 2, although the control group scored higher at pre-test, both experimental groups significantly outperformed the control group at post-test. The differences between the control and experimental groups were consistently significant, whereas no significant difference was observed between the speech and song conditions.

Figure 2
*Interaction Modality*Time*



Source: self produced

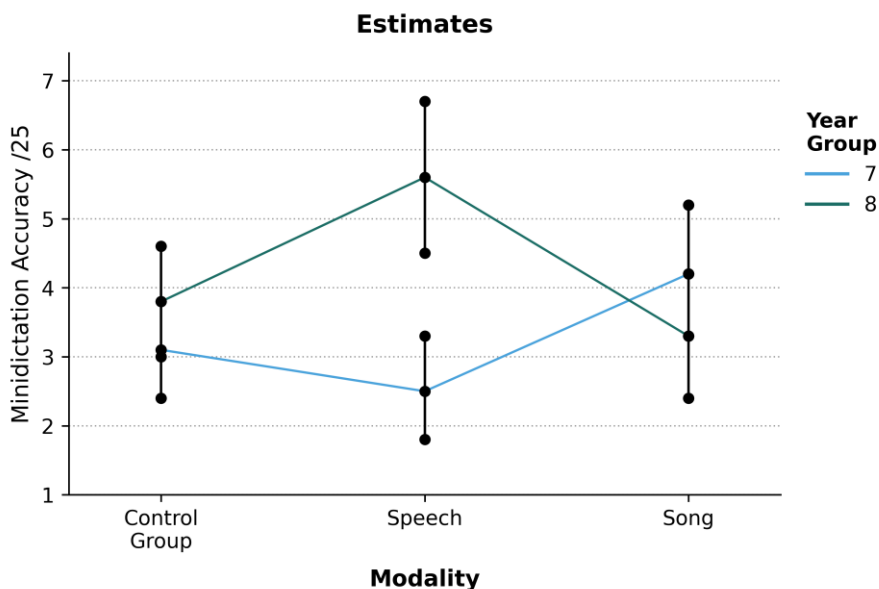
These findings indicate that the presence of music did not significantly enhance decoding performance overall. However, the comparable progress across both conditions suggests that song lyrics can serve as an equally effective medium for promoting segmentation and bottom-up listening processes in the FL classroom with or without music.

With respect to RQ3, which focused on differences between Year 7 and 8, a significant main effect of Year-Group [$F(1, 182)=7.967, p=.005$] showed that Year 8 students performed significantly better than Year 7s overall [$t(2)=.978, p=.005$], suggesting that one extra year of linguistic experience contributed to stronger decoding ability. However, Table 3 does not show any significant interaction Time*Year-Group, which indicates that the students in both cohorts improved in similar ways from pre- to post-test and therefore that the treatment can be considered suitable for both year groups.

The significant interaction Modality*Year-Group [$F(1, 182)=10.292, p<.001$] revealed that the speech treatment was more effective for older learners, whereas no significant difference between year groups was observed for the song condition (see Figure 3). However, descriptively, Year 7 students showed a slight advantage with the song approach (see Appendix A, Table A.1 for estimated means as well as Table A.3 for pairwise comparisons). A significant three-way interaction between Time*Modality*Year-Group [$F(4, 182)=8.008, p<.001$] further indicated that Year 7 students only made significant progress when exposed to the song treatment, while Year 8 students improved in both treatment conditions.

Figure 3

*Interaction Modality*Year-Group*



Source: self produced

6. Discussion

The present paper aimed to investigate the research gap in L2 aural decoding skills with an IBL activity designed to support FL learners with the challenging skill of listening (Vandergrift, 2007). The study involved Year 7 and 8 Maltese learners of Italian as FL, who were divided into three groups: a control group, a recorded-speech treatment group, and a pop-song treatment group. The statistical analyses support our hypothesis regarding the efficacy of an IBL task for developing L2 aural decoding skills, as the results of the two treatment groups were significantly higher than those of the control group in the mini-dictation task after just three sessions. Nevertheless, although the treatment groups showed significant improvement, gains were modest.

The study also reinforces the importance of the decoding sub-skill of word segmentation (Field, 2008) and the value of bottom-up approaches that move beyond comprehension testing. Such activities are believed to enhance the automation of the listening process and free working memory resources (Ravizza et al., 2016). In particular, an improvement in word-level decoding skills could be helpful in tackling the so-called “gabbling foreigner illusion” (Cutler, 2012). Mini-dictations, in this sense, proved to be an effective tool for students to strengthen their segmentation abilities (Cauldwell, 2018; Thorn, 2009).

Our findings appear to align with previous calls to integrate sub-skills such as segmentation into listening instruction (Field, 2008; Goh, 2000). The IBL approach adopted here also supports the view of listening as a tentative and hypothesis-driven process (Field, 2008), in which learners try to deconstruct messages, often perceiving forms differently from experienced listeners like teachers (Cauldwell, 2018). From this perspective, effective listening training should foster a trial-and-error process in which alternative interpretations of the message are analysed (Cauldwell, 2018) and potential difficulties are addressed in class (Goh, 2000; Vandergrift, 2003).

Results also support the inclusion of authentic materials in listening tasks, exposing students to the “*jungle*” of real-world speech even within the classroom. Although no significant difference was found between the musical and spoken versions, this suggests that authentic linguistic input, rather than music itself, may be the main factor driving improvement in this particular study. At the same time, the null difference indicates that music did not impose an additional cognitive load or hinder segmentation, contrary to what was found in Racette and Peretz (2007). Moreover, the fact that both the pop-song and recorded-speech groups showed progress, while the control group did not, highlights the benefits of activities supported by literary texts such as song lyrics (Astori, 2024; Degrave, 2019) and of lesson plans dedicated exclusively to segmentation skills (Schön et al., 2008). The relevance of authentic spoken input in Italian is further illustrated by Aliyar et al. (2026), who found that listening to an authentic Italian novel outperformed reading the same text for incidental vocabulary gains, suggesting that aural exposure to authentic Italian input can facilitate language processing in FL learners.

This approach also reflects the logic of a guided type of IBL, where teachers pose questions and students devise their own solutions, individually or collaboratively. In our study, the instructor’s role was to observe and gain insights into learners’ listening processes rather than to evaluate outcomes. Such collaborative work can be conducted in groups rather than individually (Field, 2008) to help decrease anxiety (Cooper et al., 2018) and at the same time it enables teachers to adopt a diagnostic and individualised approach to improve learners’ listening skills (Field, 1998).

Additionally, the chorus-reconstruction task with authentic materials proved to be suitable for both Year 7 and Year 8 students, with descriptive statistics and the three-way interaction indicating a preference among younger learners for the song modality. Year 8 students, however, performed significantly better than Year 7 students in the recorded-speech condition. Such advantage for younger learners

in the song condition points to a possible motivational or attentional role of music that warrants further research. Besides, the greater benefit for beginners may be linked to their recent experience in primary school, where music is often used as a learning tool (Hamilton et al., 2024), making them more receptive to this approach. More broadly, the positive outcomes of both treatment groups are consistent with research suggesting that exposure to authentic spoken input, whether inside or outside the classroom, plays a role in developing listening proficiency (Muñoz & Cadierno, 2021), reinforcing the value of incorporating authentic materials into FL listening instruction.

Overall, this study proposes an innovative IBL activity that can help students transition from the sheltered “*greenhouse*” of classroom listening practice to the complexity of the real-world “*jungle*,” bridging the gap between modified recordings and authentic spoken language. As Field (2008) reminds us, the goal of a listening activity should supersede the perceived difficulty of the material, provided that the task is well designed and accessible.

Limitations and conclusions

As suggested before, the main limitation of this study was the short treatment length. Nevertheless, the statistically significant gains in decoding skills suggest that the chorus-reconstruction teaching activity can effectively support learners. Results on the presence of music did not yield significant differences compared to recorded speech when considering all students together. However, Year 7 students seemed to benefit more from songs than from speech, while no preference was observed for Year 8 students. This suggests that music was particularly beneficial for beginners, possibly due to increased motivation, as noted in Kao and Oxford (2014). Unfortunately, no data were collected on learners’ motivation, which represents another limitation of the study.

Following Karalík and Merç's (2025) multidimensional model, listening comprehension results from the interaction of linguistic,

cognitive, and affective components. This study focused solely on the linguistic dimension (decoding skills) while future research should also address affective factors to explore how motivation and engagement shape decoding development. Further investigation is likewise needed to define the timeframe for behavioural changes linked to music in FL learning (Sun et al., 2024) and to confirm music's specific effects on listening (Hamilton et al., 2024). Furthermore, since Vangehuchten et al. (2015) found a link between musical perceptual ability and L2 phoneme/stress discrimination, future work should test whether similar effects arise in activities like the present IBL segmentation task.

Given the outcomes of this study, teachers are encouraged to introduce activities that target decoding skills, rather than limiting listening practice to comprehension testing. We also recommend incorporating IBL tasks into FL classrooms, even with beginners. Lee (2014) observed that research on classroom questioning remains limited, yet varying question types can foster metacognitive awareness. Further studies on IBL in FL contexts could thus clarify which questioning strategies most effectively promote cognitive and metacognitive growth.

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Raquel Serrano: Conceptualization; Methodology; Writing – review and editing; Supervision.

Use of AI: “Claude (Anthropic) was used to support the linguistic revision of the text. All generated content was verified and edited by the authors, who take full responsibility for the manuscript.”

Contribución de los autores

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Uso de la IA: “Se utilizó Claude (Anthropic) para apoyar la revisión lingüística del texto. Todo el contenido generado fue verificado y editado por los autores, quienes asumen la responsabilidad total del manuscrito”.

Appendix: Pairwise contrasts

Table A.1 <i>Estimated Means</i>						
Modality	Year-Group	Time	Mean	Std. Error	95% Confidence Interval	
					Lower	Upper
Control Group	7	1	2.545	.447	1.664	3.427
		2	3.591	.463	2.677	4.505
	8	1	4.400	.616	3.185	5.615
		2	3.400	.473	2.467	4.333
Speech	7	1	1.867	.463	.953	2.780
		2	3.067	.518	2.044	4.090
	8	1	2.923	.623	1.695	4.151
		2	8.231	.912	6.431	10.031
Song	7	1	2.867	.574	1.734	3.999
		2	5.733	.709	4.335	7.132
	8	1	1.417	.451	.527	2.307
		2	5.167	.752	3.682	6.651

Table A.2
Time*Modality

Pairwise Contrasts								
Time	Modality Pairwise Contrasts	Contrast Estimate	Std. Error	t	df	Adj. Sig.	95% Confidence Interval	
							Lower	Upper
1	Control Group - Speech	1.078	.543	1.984	182	.049	.006	2.150
	Control Group - Song	1.331	.527	2.525	182	.012	.291	2.371
	Speech - Control Group	-1.078	.543	- 1.984	182	.049	-2.150	-.006
	Speech – Song	.253	.533	.475	182	.635	-.798	1.304
	Song - Control Group	-1.331	.527	- 2.525	182	.012	-2.371	-.291
	Song – Speech	-.253	.533	-.475	182	.635	-1.304	.798
2	Control Group - Speech	-2.153	.620	- 3.471	182	.001	-3.377	-.929
	Control Group - Song	-1.955	.614	- 3.185	182	.002	-3.166	-.744
	Speech - Control Group	2.153	.620	3.471	182	.001	.929	3.377
	Speech – Song	.199	.737	.270	182	.788	-1.255	1.652
	Song - Control Group	1.955	.614	3.185	182	.002	.744	3.166
	Song – Speech	-.199	.737	-.270	182	.788	-1.652	1.255
The least significant difference adjusted significance level is .05.								

Pairwise Contrasts								
Modality	Time Pairwise Contrasts	Contrast Estimate	Std. Error	t	df	Adj. Sig.	95% Confidence Interval	
							Lower	Upper
Control Group	1 – 2	-.023	.504	-.045	182	.964	-1.017	.972
	2 – 1	.023	.504	.045	182	.964	-.972	1.017
Speech	1 – 2	-3.254	.653	-4.986	182	1.428E-6	-4.541	-1.966
	2 – 1	3.254	.653	4.986	182	1.428E-6	1.966	4.541
Song	1 – 2	-3.308	.633	-5.229	182	4.659E-7	-4.557	-2.060
	2 – 1	3.308	.633	5.229	182	4.659E-7	2.060	4.557
The least significant difference adjusted significance level is .05.								

Table A.3
*Modality*Year-Group*

Pairwise Contrasts								
Modality	Year-Group Pairwise Contrasts	Contrast Estimate	Std. Error	t	df	Adj. Sig.	95% Confidence Interval	
							Lower	Upper
Control Group	7 – 8	-.832	.504	-1.650	182	.101	-1.827	.163
	8 – 7	.832	.504	1.650	182	.101	-.163	1.827
Speech	7 – 8	-3.110	.653	-4.766	182	3.826E-6	-4.398	-1.823
	8 – 7	3.110	.653	4.766	182	3.826E-6	1.823	4.398
Song	7 – 8	1.008	.633	1.594	182	.113	-.240	2.257
	8 – 7	-1.008	.633	-1.594	182	.113	-2.257	.240
The least significant difference adjusted significance level is .05.								

Table A.4*Time*Modality*Year-Group*

Pairwise Contrasts									
Modality	Year-Group	Time Pairwise Contrasts	Contrast Estimate	Std. Error	t	df	Adj. Sig.	95% Confidence Interval	
								Lower	Upper
Control Group	7	1 - 2	-1.045	.643	-1.625	182	.106	-2.315	.224
		2 - 1	1.045	.643	1.625	182	.106	-.224	2.315
	8	1 - 2	1.000	.776	1.288	182	.199	-.532	2.532
		2 - 1	-1.000	.776	-1.288	182	.199	-2.532	.532
Speech	7	1 - 2	-1.200	.695	-1.726	182	.086	-2.572	.172
		2 - 1	1.200	.695	1.726	182	.086	-.172	2.572
	8	1 - 2	-5.308	1.105	-4.805	182	3.219E-6	-7.487	-3.128
		2 - 1	5.308	1.105	4.805	182	3.219E-6	3.128	7.487
Song	7	1 - 2	-2.867	.912	-3.143	182	.002	-4.666	-1.067
		2 - 1	2.867	.912	3.143	182	.002	1.067	4.666
	8	1 - 2	-3.750	.877	-4.275	182	3.083E-5	-5.481	-2.019
		2 - 1	3.750	.877	4.275	182	3.083E-5	2.019	5.481
The least significant difference adjusted significance level is .05.									