

# Language Teaching Interventions for the Linguistic Support of Migrant Children with Specific Learning Differences: Evidence from a Resource Room

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## Abstract

A growing body of literature within second language (L2) teaching has studied the effectiveness of certain language teaching activities to support L2 learners in their language acquisition. Such activities aim to draw learners' attention to the target grammatical form while their attention is on meaning to establish new form-meaning connections. Although many of these techniques have been found to be effective, previous studies have mostly focused on typically developing groups of learners and language learners instructed in classroom contexts in their home countries. Consequently, less is known about the effectiveness of such interventions in atypical groups of learners, such as children with specific learning differences (SpLDs), let alone those who learn their L2 in migrant contexts. Meanwhile, research on the effectiveness of certain language interventions in children with SpLDs has mostly focused on clinical and therapeutic contexts (i.e., in speech and language therapy centers), and research on the design, implementation, and evaluation of language teaching interventions within (public) schools remains limited. Furthermore, most of the existing research on the language support of atypically developing students in schools focuses on the pedagogical implications of certain teaching methods and much less on evaluating their effectiveness. The present study aims to fill this gap by designing, implementing, and evaluating the effectiveness of two grammar teaching interventions in migrant school-aged children with SpLDs who acquire Greek as L2 and attend resource rooms in addition to the mainstream class. This population is understudied in research, and less is known about their linguistic and educational needs. The study applied two L2 teaching techniques (Processing Instruction and Running Dictation) to teach adjectival agreement and the use of the definite article with demonstrative pronouns. The protocols were modified to the needs of those children, and their effectiveness was evaluated by means of pre- and post-tests. Additionally, students' emotions were explored by means of a questionnaire. The results revealed that both teaching protocols exhibited promising results since all participants exhibited learning gains from pre- to post-test. Furthermore, students experienced more positive than negative emotions, assigning the highest ratings to excitement during Processing

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Instruction and to pride during Running Dictation. The present findings are informative for educators, including (second) language and special education teachers, because they reflect that L2 teaching techniques used in mainstream language classrooms (i.e., FonF activities) are also beneficial to second language teaching in students with SpLDs when adapted to their needs.

### **Keywords**

Migrant children; specific learning differences; running dictation; processing instruction; special education; resource room class

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## **1. Introduction**

Throughout the last decade, language teachers have acquired more knowledge of Specific Learning Differences (SpLDs) and awareness about inclusive language teaching. However, in many educational settings, students with SpLDs are often exempted from language learning (Kormos & Smith, 2023). This practice is tightly associated with the view that achieving proficiency in a second language (L2) is beyond their skills and that this time would be better allocated to developing their first language. Furthermore, (language) teachers in mainstream classrooms often feel unprepared to support these children because they lack efficient teaching strategies. However, in this way, students with SpLDs are often marginalized and disadvantaged since they are deprived of the opportunity to learn an additional language.

Crucially, L2 language learning is of utmost importance for students with SpLDs and a migrant background for whom language learning is critical for their integration and inclusivity (Paradis et al., 2020; Whiteside et al., 2017) within and outside the classroom. Migrant children and adolescents with special educational needs, including migrant children with SpLDs, have been overlooked as a group in research, practice, and policy making. From an educational perspective, this population poses a double educational challenge for an inclusive and plural school which embraces and promotes acceptance, respect, and enhancement of their social and language resources and different abilities (Tataranni, 2022). This population often experiences a double disadvantage as the intersection of disability and cultural identity can lead to further challenges and increased integration fatigue. This can subsequently amplify discrimination and further marginalization (i.e., Traina & Caldin, 2014). Thus, it is highly important to study the design methodologies and the educational and instructional interventions and their effectiveness for the creation of inclusive learning environments (Tataranni, 2022).

Additionally, all educators (i.e., teachers in mainstream classrooms, second-language teachers, special education teachers) who have migrant students in their classrooms (with or without SpLDs) need to be equipped with the up-to-date theoretical background knowledge and with innovative research-based teaching methods to effectively support migrant students in their language learning. Furthermore, it is crucial that these methods are appealing to students since the emotional impact of the teaching methods on students relates to the learning process (see Franck & Papadopoulou, 2024 for discussion). Crucially, previous studies on L2 learners with SpLDs have shown that they experience more anxiety in the language learning classroom compared to the learners without SpLDs, with negative and stressful experiences, which may lead them to lose their motivation to learn an additional language (i.e. Csizér et al., 2010; Kormos & Csizér, 2010; Kormos et al., 2009; Kormos & Kontra, 2008; Piechurska-Kuciel, 2008).

To date, research on the language learning of migrant students with SpLDs is limited, and little is known about the effectiveness of certain grammar teaching intervention techniques in this population. Most of the studies on teaching intervention techniques on students with SpLDs have focused on language learning within a classroom setting, i.e. students with SpLDs learning an additional language in classroom that is not spoken from the surrounding community, and not on students with SpLDs learning the language of the host country both inside and outside classroom.

The present study aims to fill this gap by designing, implementing, and evaluating two teaching intervention techniques in a resource room class of a public primary school in Greece for the teaching of grammar to three migrant students with SpLDs. Resource room classes aim to further support students with special educational needs within mainstream schools where they spend a portion of their school day. The study focuses on grammar teaching since grammar plays a key role in L2 development (Nassaji & Fotos, 2011), and language learners with SpLDs benefit from grammar teaching (Kormos & Smith, 2023). These teaching interventions have been successfully used in second language (L2) teaching research and belong to Focus-on-Form (FonF) interventions (Long, 1991) for the teaching of grammar in L2 within a communicative context. These interventions aim to “force” learners to notice the target grammatical form while their focus is on meaning.

In this way, learners build new form-meaning associations. The present study exploits two of those teaching intervention techniques, Processing Instruction (PI) and Running Dictation (RD), and adapts them to the needs, age, and proficiency level of the students. The study applies evaluation tests on the target grammatical phenomena (adjectival agreement and demonstratives/determiners) before and after the teaching interventions to measure their effectiveness, as well as a questionnaire on the emotional impact of the interventions on students. In the next section (Section 2), the two language teaching techniques employed are presented, followed by a description of the target grammatical structures and their acquisition in Greek as L2 (Section 3). The present study and its methods are reported in Section 4, followed by Results (Section 5), Discussion (Section 6), and Conclusions (Section 7).

## 2. Focus-on-Form teaching interventions

### 2.1 PI

PI draws from Input Processing (Van Patten, 1996; Van Patten, 2002), a psycholinguistic model which describes the default strategies that learners use when receiving language input. PI aims to alter these strategies by providing learners with more enriched input to notice the target grammatical form while processing sentences for meaning. One major component of PI is structured input activities, which are divided into referential and affective. In referential activities, learners listen or read sentences and are “forced” to focus on the target grammatical form to assign the correct meaning. Affective activities require the learner to express a belief/opinion or other affective reaction towards the content of a sentence, which includes the target grammatical form. Only referential activities have correct/incorrect answers. PI also optionally includes two explicit components before the structured input activities, i.e., (a) the explicit teaching of the target form and its mapping with a certain meaning, and (b) a component which explicitly draws the learners’ attention to the incorrect processing strategies they employ during processing the target structure.

PI has been shown to be effective with several grammatical structures and with several languages and groups of learners, including (older) adults, adolescents, and children, with the effects remaining for long after the intervention (see Wong, 2024 for a recent literature review on PI), including (heritage) learners of Greek as L2 (Agathopoulou et al., 2013 as cited in Agathopoulou & Papadopoulou, 2014; Ouli & Konta, 2025; Papadopoulou, 2010). Furthermore, it has been found to be effective not only in comprehension but also in production (Qin, 2008) and online processing (Lee & Doherty, 2018; Lee et al., 2022). Most importantly, PI has also been implemented in atypical populations, i.e., monolingual adult aphasic patients (Santamaria et al., 2013), monolingual school-aged children who are deaf and hard of hearing (Barcroft et al., 2025), and monolingual school-aged children with Developmental Language Disorder (Paspali, submitted). Consequently, there is evidence for the effectiveness of PI with both L2 learners as well as with atypical monolingual (child) populations.

### 2.2 RD

Group dictation differs from traditional dictation in that it involves collaborative learning, where students work together rather than individually (Wajnryb, 1990; Willis & Willis, 2007), which is particularly beneficial to second language (L2) learners. Through such activities, learners promote interaction and language production (see Sousa et al. 2019 for discussion). Consequently, learners become more aware of the target grammatical forms in the input, which can support the association between new form-meaning connections (see Schmidt, 1990, regarding the Noticing Hypothesis). Several variations of group dictation have been employed, including Dictogloss and RD (Scrivener, 2011). Such activities aim to develop all language skills while also reinforcing grammatical structures (Jacobs & Small, 2003; Nurdianingsih & Rahmawati, 2018; Qin, 2008; Yolanda, 2019). In the present study, we focus on running dictation, because it is considered less demanding than dictogloss for learners with low proficiency in L2 (Olioumtsevit's et al., 2023 and references therein). In RD, students have continuous access to the original text hanging on the wall, which they must reconstruct, usually by filling out the gaps missing in their own text. This is done by switching roles, i.e., the writer who writes the missing words and the runner who runs, reads the missing word from the text on the wall, and dictates it to the writer of their team. This format is relatively simple to implement and highly engaging. The activity fosters peer interaction and mutual support within an inclusive environment where all students have an equal opportunity to participate, promoting motivation and engagement in the learning process (Nurdianingsih & Rahmawati, 2018; Zulraudah & Jufri, 2014).

Previous studies with RD demonstrate that students have positive attitudes towards this technique, together with teamwork development, increased concentration, and more enjoyable learning (Indah, 2019). Empirical studies indicate that this technique encourages role delegation and rotation (Jacobs & Small, 2003) and improves listening, writing, and

speaking skills (Gustiani & Yulia, 2018; Zakiyah & Husniah, 2017; Aisyah & Hidayani, 2018). Olioumtsevits et al. (2023) employed Running Dictation to teach Greek tense and agreement in school-aged children with refugee backgrounds. Although no significant learning gains were found from pre- to post-tests, children changed the error patterns they made, i.e., they exhibited more systematic and predictable error patterns after the interventions, reflecting qualitative changes in their language development.

### 3. The grammatical phenomena under instruction

#### 3.1 Agreement

In terms of agreement, Greek is a language with a tripartite grammatical gender (masculine, feminine, neuter) denoted on the articles, adjectives, pronouns, etc. Agreement between the article, the adjective, and the noun is obligatory both within the noun phrase and when the adjective is in predicative position. Agreement is realized morphologically via inflectional suffixes denoting gender, number, and case. Phonological matching between the suffix of the noun and of the adjective may (1-2) or may not be present (3-4). Furthermore, there is not a one-to-one mapping between a certain suffix and a certain gender value, and in this sense, inflectional suffixes are ambiguous (e.g., (3) vs. (4)). L2 learners of Greek, both children and adults, commit errors in adjectival agreement in terms of number, gender, and case, especially during the initial stages of acquisition (see Agathopoulou et al., 2008 and references therein).

(1) o megalos kipos

the-NOM-MASC-SG big-NOM-MASC-SG garden-NOM-MASC-SG

(2) to prasino parko

the-NOM-NEUT-SG green- NOM-NEUT-SG park-NOM-NEUT-SG

(3) i megali harakes

the-NOM-MASC-PL big-NOM-MASC-PL ruler-NOM-MASC-PL

(4) i ksilini karekla

the-NOM-FEM-SING wooden-NOM-FEM-SING chair-NOM-FEM-SING

#### 3.2 Definite article with demonstrative pronouns

In terms of the definite article, its use with demonstrative pronouns (5) as well as with the Greek universal quantifier *olos* is obligatory in Greek. Both the definite article as well as the demonstrative pronoun or *olos* agree with the noun in terms of gender, number, and case (5). This structure causes difficulties in L2 Greek (see Agathopoulou et al., 2011 and references therein), with learners omitting the definite article but never supplying incorrectly (i.e., the use of indefinite instead of a definite article).

(5) aftos o kipos

this-NOM-MASC-SING the-NOM-MASC-SING garden-NOM-MASC-SING

### 4. The present study

The present study employed two teaching protocols to teach students with SpLDs adjectival agreement and the use of the definite article with demonstrative pronouns and the quantifier by means of PI and RD grammar teaching intervention techniques, respectively. The two teaching protocols were assessed in terms of their effectiveness by means of pre- and (delayed) post-tests and of their emotional impact on students (by means of a students' questionnaire on their emotions during each teaching intervention).

#### 4.1 Participants

Three children from the third and fourth grade participated in the present study (mean age in years: 9; 5, 2 girls). All three children had a migrant background, with Albanian being their first language and Greek their L2 (mean years of stay in Greece: 4 years). None of the children had developed literacy and print exposure to Albanian. Based on the mother's educational level, all three children were from low-socioeconomic status families. Based on their teachers' report, all three children had been diagnosed with (mild) SpLDs (see DSM-5, 2013, i.e., specific learning disorders with impairments in reading: reading rate, fluency, deficits in reading comprehension; written expression: spelling accuracy, grammar and

punctuation accuracy, organization or written expression; and in mathematics: number sense, memorization of arithmetic facts, accurate of fluent calculation, accurate math reasoning, or a combination of them) by the official governmental agency for diagnosing learning and speech language difficulties in Greece (Centers of Interdisciplinary Assessment, Counseling and Support, KE.D.A.S.Y.). All children participated in a language placement test (Diapolis placement test; Tzevelekou, Giagkou, Kantzou, Stamouli, Papadopoulou, & Anastasiadi-Symeonidi, 2013) assessing their language skills in Greek. More time was allocated to children in each exercise of the placement test given the presence of SpLDs. Their scores indicated an A2 proficiency level (A2 range: 11-22 out of 36 points) with one of the three children being close to a B1 level (Participant 1: 11 points, Participant 2: 11.5 points, Participant 3: 21 points). The teaching protocols described in the next subsection were conducted in the resource room of the school. Ethical approval of the study was obtained from the Research Ethics Committee of the Aristotle University of Thessaloniki (56583/2025). The participants gave oral informed consent, and their guardians gave their written informed consent according to the Declaration of Helsinki.

#### 4.2 PI teaching protocol targeting agreement

The protocol consisted of an explicit teaching component in which students were briefly instructed the inflection of adjectives by case, gender, and number via visual illustrations, reading and listening mode, and of certain cases in which they employ incorrect processing strategies in the suffixes of the adjectives (i.e. when they rely more on the morphophonological matching between the suffixes of the noun and of the adjective, which does not always lead them to correct answers, rather than the features of the article). Then, there were 4 referential activities and one affective activity. The first two referential activities targeted the inflection of adjectives in the nominative and accusative cases (activities 1 and 2, respectively). In these activities, students were provided with sentences, in which the adjective was missing, in listening and written mode, and had to select the correct adjective from a box for each sentence. The activities were designed in such a way that all adjectives could lexically match all sentences. Thus, the students were “forced” to focus on the inflectional suffixes of the nouns and adjectives to assign the correct matching. In the next activity, the students were presented with a pair of the same sentence with/without an agreement error on the adjective and were asked to decide which of the two sentences is correct. This activity drew their attention to two competing forms (correct vs. incorrect form of adjective for a noun). Thus, it aimed to present them with their incorrect processing strategies and to alter them. The fourth referential activity had the same goal with the previous one for a specific and very frequent error students made with the suffixes of the adjective when presented with masculine plural nouns (i.e. they overgeneralize the feminine plural suffix of the adjective to the masculine plural suffix due to morphophonological matching: *megales pinakes* instead of *megali pinakes*). The referential activity was a thumbs up/down game, in which the students were presented both in written and listening mode with sentences including adjectival agreement structures and had to decide whether they (dis)liked the depicted nouns. The protocol was completed within 1.5 teaching hours (60-70 minutes) and was taught by the researcher in the presence of the teacher. In all referential activities, the researcher said the answers of each sentence aloud and wrote them on the board, and students were asked to correct their own answers in the booklet in front of them at the end of each activity. Students were presented with 40 adjectival agreement targets throughout the intervention, split equally for gender, number, and case. Explicit oral and written instructions were given before each activity, followed by examples.

#### 4.3 RD teaching protocol targeting the use of the definite article with demonstrative pronouns

Two texts were designed for this protocol. Both were about moving to a new place and the rooms of a house, which are familiar topics for this level of proficiency. Vocabulary of the texts was carefully selected to match students' lexical knowledge and the proficiency level of the texts was between A1-A2 based on the readability software by the Center of Greek language, which helps teachers evaluate the readability of any Greek text based on objective criteria in order to determine whether it is appropriate for their students' level of Greek proficiency. The students were split into two groups (another migrant student without SpLDs took part in this activity, so that two teams of two members were formed). They first listened to the text via the pre-recorded audio file. Then, they were given detailed instructions on the activity and each step. Each student had to run and find the missing phrase (including the target structure) from their incomplete text based on the complete text hanging on the wall. Each gap (missing phrase) was preceded by an identification number in both the complete and the incomplete versions of the text to facilitate students in their search within the texts. The student had to run back to their team and dictate the phrase missing. After each run, the student became the writer, and the two members of each team alternated roles consecutively. The protocol was completed within 1.5 teaching hours (60-70 minutes) and was taught by the researcher in the presence of the teacher. Students were presented with 20 gaps within the

text, including the target structure throughout the intervention (17 targets of demonstrative pronouns and 4 targets of the universal quantifier *olos*, 12 targets in singular, 8 in plural, 10 in nominative case, and 10 in accusative case). The researcher gave instructions orally and illustrated the steps and the roles in RD. After each text, students were asked to unhang the completed text from the wall and to correct their errors using a pen with a different colour.

## 4.4 Evaluation

### 4.4.1 Pre- and post-tests for adjectival agreement

A comprehension and a production task were constructed to test adjectival agreement in pre-, post-, and delayed post-tests. The pre-test was conducted a week before the intervention, the post-test was conducted immediately after the intervention, and the delayed post-test was conducted two weeks after the intervention. All tests were conducted by the author. Each test lasted approximately 30 minutes. The comprehension task consisted of 12 sentences in which the adjective was missing, and the students were provided with options and were asked to select the correct one. The researcher also read aloud each sentence and the three options. Each student had to select the correct option in their own booklet, and no feedback was given during the pre-test and the (delayed) post-test. In the production task, students were asked to put the adjective given in the correct form within the sentence. There were 12 sentences, and the researchers also read the sentences aloud. No feedback was given, and each child had to write down their own answer in their booklet. There were 4 nouns by each gender in each task; half of the items were in the plural, and half of the items were in the accusative case. All tests (pre-test, post-test, and delayed post-test) were constructed similarly. First, all sentences were constructed, and then, they were randomly assigned to teach test.

### 4.4.2 Pre- and post-tests for the presence of definite article with demonstrative pronouns

A comprehension task was constructed to test the use of the definite article with demonstrative pronouns and the universal quantifier *olos* in pre- and post-tests. The pre-test was conducted two days before the intervention, and the post-test was conducted immediately after the intervention. No delayed post-test was applied in this intervention due to time limitations. All tests were conducted by the author. Each test lasted 7-10 minutes approximately. The comprehension task consisted of 5 sentences in which the target structure was missing, and the students were provided with options and were asked to select the correct one. The researcher also read aloud each sentence and the three options. Each student had to select the correct option in their own booklet, and no feedback was given during the pre-test and the post-test. Both tests (pre-test and post-test) were constructed similarly. There were 4 items with demonstrative pronouns and one with the universal quantifier *olos* per test. First, all sentences were constructed, and then, they were randomly assigned to teach test. Orthographic and spelling errors were not taken into consideration in students' accuracy scores in the evaluation tests.

### 4.4.3 Questionnaire on students' emotions

The questionnaire employed to assess students' emotions was an adapted version of the questionnaire used in Franck & Papadopoulou (2024) after a teaching intervention in adult migrant populations. Participants were asked to rate the strength of the emotions they had experienced during the teaching interventions. As reported in Franck & Papadopoulou (2024), thirteen emotions were tested, including both positive and negative ones. Furthermore, epistemic emotions (confusion, curiosity, excitement, frustration, and surprise) and a subgroup of achievement emotions (anger, enjoyment, despair, hope, shame, and pride) from the Achievement Emotions Questionnaire AEQ-S (Frenzel et al., 2009) were employed. Emotions which are considered both epistemic and achievement emotions (boredom and anxiety) were also included. Answers were given on a 5-point Likert scale (1 = "Not at all"; 5 = "Very strong"). Before the completion of the questionnaire, the meaning of each emotion was orally explained by the researcher, and examples were given to make sure that the children understood each one of them. Detailed instructions with examples were also given by the researcher for the completion of the questionnaire.

## 5. Results

The results from the two teaching interventions are presented below (sections 5.1 and 5.2), followed by the results on the emotional effect of the protocols applied to students (5.3). Given the small sample size, as is mostly the case in language interventions with atypical (child) populations (Santamaria et al., 2013), no inferential statistics were conducted. Below the mean, the standard deviation as well as the participants' individual scores in the pre- and post-test for each teaching intervention were calculated and the improvement for each participant was computed (i.e., see learning gains and retention in Table 2) and reported below to provide a more informative view of the interventions' effects. Participants' mean ratings

and standard deviations for the emotional impact of the protocols were also computed and reported below. In Table 1, the results of the control structure (passives), in which the participants did not receive any teaching intervention, are reported. Focusing on the mean by task and the mean in both tasks, the results overall indicate that participants did not improve from pre- to post-test, as expected.

**Table 1. Mean accuracy, individual scores, and learning gains (mean difference between post- and pre-test) in the control structure (passives). Standard deviations (SDs) in parentheses**

Tests	Accuracy		
	Pre-test	Post-test	Learning gains
<b>Comprehension task</b>			
Participant 1	0.60 (0.55)	0.40 (0.52)	-0.20
Participant 2	0.60 (0.55)	0.40 (0.52)	-0.20
Participant 3	0.40 (0.55)	0.40 (0.52)	0.00
Mean	0.53 (0.52)	0.40 (0.50)	-0.13
<b>Production task</b>			
Participant 1	0.17 (0.40)	0.00 (0.00)	-0.17
Participant 2	0.00 (0.00)	0.14 (0.38)	0.14
Participant 3	0.17 (0.41)	0.29 (0.49)	0.12
Mean	0.11 (0.32)	0.14 (0.36)	0.03
<b>Comprehension &amp; Production tasks</b>			
Participant 1	0.36 (0.51)	0.24 (0.44)	-0.12
Participant 2	0.27 (0.47)	0.29 (0.50)	0.02
Participant 3	0.27 (0.47)	0.35 (0.50)	0.08
Mean	0.30 (0.47)	0.29 (0.46)	-0.01

## 5.1 PI teaching protocol

Table 2 shows the results of the evaluation tests before and after the PI teaching intervention. The higher the numbers are in the learning gains and in retention reported in Table 2, the greater improvement was from pre- to post-test, and the greater the retention of this improvement in the delayed post-test was compared to the post-test (i.e. learning gains: accuracy in the post-test – accuracy in the pre-test, retention: accuracy in the delayed post-test – accuracy in the post-test).

In the Comprehension task, PI seems to help students a lot in comprehension, given that all 3 of them showed high learning gains with performance above the acquisition rate (> 90%). This high performance was retained for one student in the delayed post-test, while the other two exhibited less retention of their learning gains after two weeks, with only one of them performing above chance levels. Note that the student who retained the highest post-test performance in the delayed post-test was the one with the higher score in the pre-test (i.e., 0.58).

In the Production task, PI seems to help students in production, given that all 3 of them exhibited learning gains. Only one student exhibited performance above the acquisition rate (> 90%) in the post-test. This was the student with the highest pre-test accuracy score. The other two students also showed increased performance in the post-test, but their accuracy scores were at or slightly above chance levels. All students retained their improved performance in the delayed post-test.

**Table 2. Mean accuracy and individual scores in the Comprehension and Production task in the pre- and (delayed) post-tests for the PI teaching intervention targeting adjectival agreement (SDs in parentheses), Learning gains (mean difference between post- and pre-test), and Retention (mean difference between delayed post-test and post-test)**

Tests	Accuracy				
	Pre-test	Post-test	Delayed post-test	Learning gains	Retention
<b>Comprehension task</b>					
Participant 1	0.25 (0.45)	1.00 (0.00)	0.75 (0.45)	0.75	-0.25
Participant 2	0.25 (0.45)	0.92 (0.29)	0.58 (0.52)	0.67	-0.34
Participant 3	0.58 (0.52)	0.92 (0.29)	0.92 (0.29)	0.34	0.00
Mean	0.36 (0.49)	0.94 (0.23)	0.75 (0.44)	0.58	-0.19
<b>Production task</b>					
Participant 1	0.33 (0.49)	0.58 (0.52)	0.67 (0.50)	0.25	0.09
Participant 2	0.08 (0.29)	0.67 (0.49)	0.67 (0.49)	0.59	0.00
Participant 3	0.58 (0.52)	0.92 (0.29)	0.92 (0.29)	0.34	0.00
Mean	0.33 (0.48)	0.72 (0.45)	0.75 (0.44)	0.39	0.03
<b>Comprehension &amp; Production tasks</b>					
Participant 1	0.29 (0.46)	0.79 (0.41)	0.71 (0.46)	0.50	-0.08
Participant 2	0.17 (0.38)	0.79 (0.42)	0.62 (0.50)	0.62	-0.17
Participant 3	0.58 (0.50)	0.92 (0.28)	0.92 (0.28)	0.34	0.00
Mean	0.35 (0.48)	0.83 (0.38)	0.75 (0.43)	0.48	-0.08

## 5.2 RD teaching protocol

Table 3 shows the results of the evaluation tests before and after the RD teaching intervention as well as the learning gains. All participants improved their scores after the intervention. Note that the learning gains are high, i.e., near or above the acquisition threshold (90%).

**Table 3. Mean accuracy and individual scores in the pre- and post-tests for the RD teaching intervention targeting the use of the definite article with demonstrative pronouns and Learning gains (mean difference between post- and pre-test)**

Tests	Accuracy		
	Pre-test	Post-test	Learning gains
Participant 1	0.60 (0.55)	0.80 (0.45)	0.20
Participant 2	0.40 (0.55)	0.80 (0.45)	0.20
Participant 3	0.40 (0.55)	1.00 (0.00)	0.60
Mean	0.47 (0.52)	0.87 (0.35)	0.40

## 5.3 Questionnaire on students' emotions

Participants overall experienced more positive than negative emotions during both teaching interventions (Figure 1) since they assigned higher ratings to positive than negative emotions. The emotion with the highest rating was excitement in PI



and pride in RD. Furthermore, children seemed to experience more anger and less hope in RD compared to PI (see below for discussion). Both teaching interventions overall exhibited similar emotional impact on students (positive emotions: PI = 3.3, RD = 3.2; negative emotions: PI = 1.4, RD = 1.4). When looking at the positive and negative emotions by type (achievement vs. epistemic), the picture looks similar to the mean positive and negative ratings. The only exception is achievement emotions (enjoyment and pride) in RD which numerically stand out with even higher ratings (achievement emotions-positive: PI = 3, RD = 4; achievement emotions-negative: PI = 1.3, RD = 1.4; epistemic emotions-positive: PI = 3.6, RD = 3; epistemic emotions-negative: PI = 1.5, RD = 1.4).

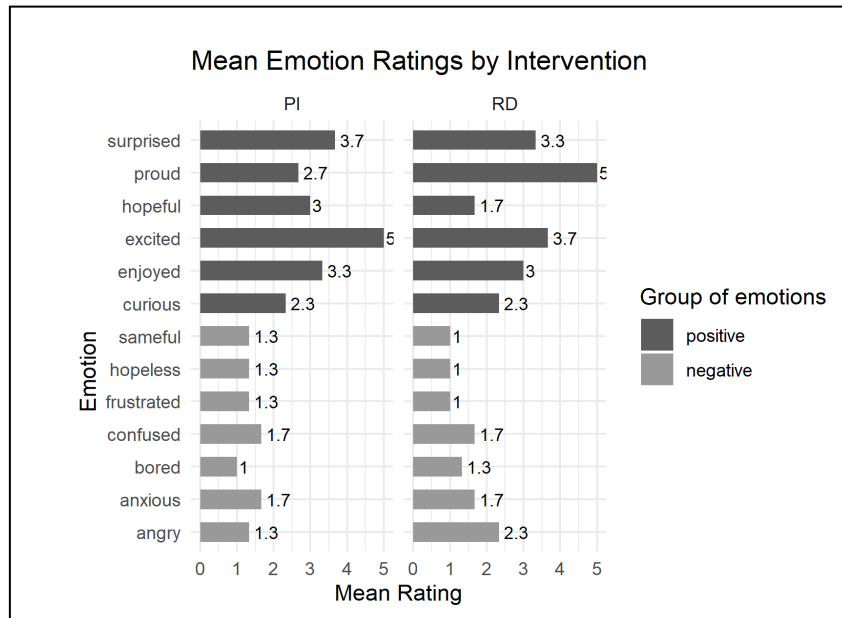


Figure 1. Mean ratings of learners' positive and negative emotions for the two teaching interventions (PI, RD).

## 6. Discussion

The present study explored the effectiveness of two L2 FonF teaching interventions as well as their emotional impact on three migrant school-aged students with SpLDs in a resource room of a Greek public primary school, who had Greek as their L2 and language of their host country. The teaching interventions focused on grammar teaching, a vulnerable domain in L2 learning in learners with SpLDs (Kormos & Miko, 2010), and specifically on the teaching of adjectival agreement and the use of the definite article with demonstrative pronouns. The teaching interventions of PI (adjectival agreement) and RD (the use of the definite articles with demonstrative pronouns) were employed. The results revealed that both teaching interventions were effective for all students as indicated by their accuracy scores in the pre- and post-tests before and after the interventions, respectively, and students experienced more positive than negative emotions in both interventions. Crucially, students did not exhibit gains in the control structure (passives), reflecting that the learning gains in the RD and PI teaching interventions are less likely to be attributed to other reasons (i.e., training effects during the pre- and post-tests).

In terms of PI targeting adjectival agreement, the teaching intervention increased students' accuracy in the post-test. In the comprehension task, the students exhibited a performance above the acquisition threshold (> 90%) in the post-test, reflecting great learning gains. The learning gains were maintained after two weeks for all students, as the delayed post-test showed. Although retention was present, accuracy scores dropped below the acquisition threshold for two out of three students, but these students still performed above chance levels. In the production task, all students exhibited increased accuracy in the post-test, but only one student reached the acquisition threshold and also maintained their accuracy score in the delayed post-test. Importantly, in both comprehension and production, the student with the highest learning gains and the highest retention was the one whose performance in the pre-test was slightly below chance levels. The other two students, whose performance in the pre-test was very poor, also exhibited learning gains and retention. Thus, these students might have needed more hours of intervention, given that the current intervention lasted only 1,5 teaching hours. Additionally, the students with the highest score in the pre-test and the highest learning gains and retention might have

been more “ready” for this intervention, i.e., the instructed material was more tailored to their own needs (i.e., this is the student with the highest proficiency). The present results show that PI, including an explicit teaching component, is effective with long-term effects in both comprehension and production, which is in line with previous studies in typically developing L2 populations (e.g., Agathopoulou & Papadopoulou, 2014; Shintani, 2015; VanPatten & Cadierno, 1993).

In terms of RD targeting the use of the definite article with demonstrative pronouns in Greek, the teaching intervention increased students’ accuracy in the post-test. The students performed above or relatively close to the acquisition threshold (i.e., 80-92%). The present results show that RD, a collaborative group activity without an explicit teaching component, is effective for students with SpLDs. This is one of the few studies that assesses the effectiveness of RD in terms of grammar. Olioumtsevitse et al. (2023) employed RD with typically developing refugee school-aged children who learnt Greek as L2 and found positive qualitative results on children’s grammatical abilities (i.e., gender agreement and tense).

In terms of the emotional impact of the teaching interventions, students overall experienced more positive than negative emotions during both teaching interventions since they assigned higher ratings to positive than negative emotions. Furthermore, the emotion with the highest rating in PI was excitement, and in RD was pride. This has probably been influenced by the fact that the PI intervention was conducted first, hence children may have been more excited about the learning process. Furthermore, the final activity of PI was an affective one, allowing children to express their personal view on whether they liked certain objects, and this activity was conducted by means of a game (i.e., thumbs up/down). On the other hand, pride obtained the highest rating in RD, which could probably relate to the fact that all children won once during RD. In a similar vein, children seemed to experience more anger and less hope in RD compared to PI, given that they all lost during RD once. Crucially, anxiety and confusion received low ratings in both tasks. This is probably associated with the fact that feedback on accuracy throughout both teaching interventions was given orally for each exercise and in written mode on the board, followed by self-correction (and not by correcting each student’s errors directly and explicitly). In this way, overt focus on accuracy and spelling was mitigated from the self-correction stage. This is crucial, given that explicit emphasis on spelling and errors in written tasks is one of the most important reasons for anxiety in this population (Kormos et al., 2009). These findings are highly informative about these two teaching interventions in children with SpLDs, given that these children often experience negative and stressful experiences in language learning, and hence they may lose their motivation to learn an additional language (Csizér et al., 2010; Kormos & Csizér, 2010; Kormos & Kontra, 2008; Piechurska-Kuciel, 2008).

The present study also has certain limitations. The small sample size is one of them. Furthermore, no control group was included (children with SpLDs participating in the pre- and post-tests and not in the teaching interventions). However, control structures were employed in which the participants did not show learning gains. In addition, delayed post-tests were only employed in PI and not in RD due to limitations of time. Thus, future research should address these gaps.

The present study shows that migrant students with SpLDs were able to engage in FonF learning activities and to expand their L2 knowledge on two grammatical structures (agreement and the use of the definite articles with demonstrative pronouns) which are known to be vulnerable in the acquisition of L2 Greek. Furthermore, the students experienced positive feelings during the interventions, which is important for the degree of their engagement with the teaching and learning materials and subsequently, with their language learning and development (Franck & Papadopoulou, 2024; Olioumtsevitse et al., 2023). The present study shows that L2 migrant learners of Greek with SpLDs were successfully engaged in and benefited from L2 grammar teaching interventions employed in mainstream language classrooms, despite their learning differences. Thus, the present results are in line with the previous literature arguing that children with SpLDs can learn via similar teaching techniques to the ones in mainstream language classrooms when these techniques include good teaching practice and are tailored to their needs (Kormos & Smith, 2023 for discussion and references therein).

## 7. Conclusions

To our knowledge, this is the first study that (a) developed, implemented, and evaluated novel teaching tools to support language teaching and learning in migrant school-aged students with SpLDs and (b) also evaluated migrant children’s emotions after the implementation of two grammatical teaching interventions. Thus, the study evaluated both the effectiveness of the teaching interventions at the level of L2 acquisition as well as their emotional impact on students. The results of the present study seem to be promising and useful for educators, given that children seem to improve their language performance on the target grammatical structures and to experience more positive than negative emotions during the interventions. More research needs to be conducted in this direction, which will explore similar methods for the linguistic support of this population as well as the relevant stakeholders who could implement such teaching interventions.

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