

## Registry of Efficacy and Effectiveness Studies

### Study Title:

Does the multilingual comparison of constructions facilitate learning? An analysis of the acquisition of the Spanish prepositions a and de after motion verbs through mono- and multilingual pedagogical construction grammar

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### Section I: General Study Information

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**Study Start Date:**

2025-04-01

**Study End Date:**

2025-10-31

**Intervention Start Date:**

2025-05-06

**Timing of entry:**

Prior to collection of outcome data

**Brief Abstract:**

The use of prepositions is one of the most difficult grammar topics for Spanish learners. The high frequency prepositions *a* ('to/at/on') and *de* ('from/of') are often confused or omitted, especially in motion verb constructions (Kanli, 2024). These prepositions are highly polysemous, i.e. they can have different meanings or functions, which can

make it challenging to acquire them (Wulff & Ellis, 2018, 39-41). In addition, crosslinguistic influence plays a significant role, above all in third language acquisition (Rothman, 2019).

This project aims to pursue the creation and evaluation of teaching material with a Randomized controlled trial (RCT)

(Connolly et al., 2017) and a mixed-method design for the task-based unit "Planning a weekend in Spain". Two intervention packages "Pedagogical construction grammar" and "Multilingual pedagogical construction grammar" have

been created to introduce the construction [motion verb + *a/de* + noun] in Grade 8 at secondary schools. They combine

current research results from the emergent linguistic theory of usage-based construction grammar (Goldberg, 2006; Fried & Nikiforidou, 2025) and its application in L2/Ln acquisition (Boas 2022; De Knop, 2025) with multilingual didactics (Fäcke & Meißner, 2019) in authentic task-based classes (TBLT) (Ellis et al., 2019). The data analysis is based on empirical standards in educational science.

The main hypothesis we are testing is that the intervention package "Multilingual pedagogical construction grammar" is

the most effective for sustainably acquiring prepositions. Furthermore, in accordance with Aptitude-treatment interaction (ATI) research (DeKeyser, 2021), we assume that students profit to varying degrees from the treatment depending on their cognitive aptitudes and language biographies. This gives rise to the additional research question, which is in first line explorative: Are individual differences in language biography (simultaneous bilingual / monolingual; L3 French / Latin), usage of Multilingual Strategy Inventory for Language Learning (M-SILL) (Dmitrenko, 2017) and working memory (OSPAN) (Ruiz et al., 2019) associated with the two different instructional conditions?

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#### Keywords:

RCT, usage-based construction grammar, multilingual didactics, task-based learning; third language acquisition, language learning

#### Comments:

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*Section II starts on the next page.*

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## **Section II: Description of Study**

### **Type of Intervention:**

Curriculum/Product, Practice, Professional Development

### **Topic Area of Intervention:**

Education Technology, Applied Linguistics, Spanish Language Learners

### **Number of intervention arms:**

1

### **Target school level:**

8

### **Target school type:**

Rural, Suburban, Urban

### **Location of Implementation:**

*International:* Europe

### **Further description of location:**

German Federal State of Baden-Wuerttemberg

### **Brief Description of Intervention Condition:**

The experiment leader, who is a trained secondary school teacher, will teach both intervention packages “Pedagogical construction grammar” and “Multilingual pedagogical construction grammar”. They are embedded in two task-based 60-minute classes with the same structure: The class starts with a pre-viewing activity, where the previous vocabulary knowledge is activated in a communicative exercise. During the viewing activity, the meaning of the image schemas is introduced with animations. These animations are meant to support students in the next phase, which consists in completing a so-called pedagogical constructicon. For this next step, a ‘within-class randomization’ is planned: While half of the class receives a monolingual constructicon that includes only Spanish constructions with the targeted prepositions the other half works with a multilingual constructicon, where constructions from different languages are compared. The consolidation of results will be done through an interactive instructional video. Students will watch it after completion of the constructicon, to correct their constructicon and understand the meaning of the described image schema - one group with the monolingual version of the video and the other with the multilingual. In the post-viewing activity, the students plan their weekend in a Spanish city, while using the construction [motion verb + a/de + location]. The next 60-minute session follows approximately the same sequence but will focus on the construction type [ir + de + activity or event], as in ir de compras (‘to go shopping’), after a brief review task.

### **Brief Description of Comparison Condition:**

The main research interest is to compare the monolingual and multilingual intervention packages. In addition, a ‘business as usual’ effect will be measured and used as a baseline.

There are four measurement points in total where students fill in a cloze test: t1 in the Spanish class immediately before the intervention; t2 immediately before the intervention; t3 immediately after the intervention; t4 two or three months after the intervention. The effect of t1 to t2 can be interpreted as a 'business as usual' effect. The effect from t2 to t3 can be interpreted as the 'intervention' effect, which we hypothesise will differ according to the intervention package.

**Comparison condition:**

Business-as-usual

**Comments:**

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**Section III: Research Questions**

**Confirmatory research questions:**

**Question 1:**

The intervention package “Multilingual pedagogical construction grammar” is more effective compared to the intervention package “Pedagogical construction grammar” in helping students who learn Spanish as the third foreign language from Grade 8, to express themselves in an idiomatically correct way, while using the construction [motion verb + a/de + noun] to describe their plans for a weekend.

**Question 2:**

The intervention (t2-t3) has a significant effect on students' performance (measured by a cloze-test) compared to the 'business-as-usual' effect (t1-t2).

**Exploratory research questions:**

**Question 1:**

To what extent does the effectiveness of the two intervention packages (multilingual / monolingual) depend on students' individual differences as the usage of Multilingual Strategy Inventory for Language Learning (M-SILL) (Dmitrenko, 2017) and on students working memory capacity (OSPAN) (Ruiz et al., 2019)?

**Question 2:**

Do students with a higher working memory capacity outperform students with a lower working memory capacity in both intervention packages, but even more in the intervention package “Multilingual pedagogical construction grammar”?

**Question 3:**

Does students' score in the adopted questionnaire 'Multilingual Strategy Inventory for Language Learning' (M-SILL) (Dmitrenko, 2017) correlate with the outcome in the intervention package “Multilingual pedagogical construction grammar”?

**Question 4:**

Do 'heritage speakers' use more multilingual language strategies (Dmitrenko, 2017 for adults; Saez-Fajardo, 2023, 10 for teenagers), which makes them benefit more from the multilingual intervention package?

**Question 5:**

Does the L3 (French or Latin) influence the students' performance in the use of prepositions?

**Question 6:**

Do the results of the cloze tests correlate with the general level of Spanish (measured by an adopted C-test)?

**Question 7:**

Does teachers' use of digital media (such as explanatory videos), their familiarity with teaching chunks and the multilingual approach, as well as the level of difficulty they attribute to prepositions, influence the results?

**Question 8:**

Do students in the stimulated recall reactivate their declarative knowledge on the function of different construction types in Spanish and other languages, which were introduced in the intervention?

**Question 9:**

Qualitative modulation of 'multilingual constructicons' before and after the intervention from three students per class  
Are there interlanguage phenomena in the pretest that may be influenced by equivalent constructions in the L1(s) or other foreign languages? To what extent does the supplementary input in the multilingual constructicon during the intervention influence the type of interlanguage phenomena and the re-organisation process of the 'constructicon' in the posttest and delayed posttest?

**Comments:**

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**Section IV-A: Study Design (Selection)****Study Design:**

Randomized Trial (RT)

**Comments:**

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**Section IV-B: Study Design (Input)*****Study Design: Input*****Unit of random assignment of intervention:**

Student

**Assignment within sites or blocks:**

Yes

**Define the sites or blocks:**

Spanish class

**Probability of assignment to treatment the same across sites or blocks:**

Yes

**Probability of assignment to treatment:**

0.5

**Unit outcome data measured:**

Student

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**Intermediate clusters between unit of random assignment and unit of measurement:**

No

**Comments:**

Within-class-randomization: Students within each class are randomly assigned to one of the two intervention groups—"Pedagogical construction grammar" or "Multilingual construction grammar"—by drawing small cards.

***Design Classification***

**Based on the responses above, this study has been classified as:**

RT: Multisite (Blocked)

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**Section V: Sample Characteristics**

**Approximate number of students in the comparison condition within each block (Spanish class): 8**

**Approximate number of students in the intervention condition within each block (Spanish class): 8**

**Number of blocks (Spanish class): 17**

Yes - Only students studying Spanish as a third language in grade 8 in secondary schools (academic track schools, G8) were eligible to participate. Another condition was the use of the textbook "¡Vamos! ¡Adelante! Curso Intensivo 1" (Barquero et al., 2016), in order to control for the vocabulary and grammar they had learned in the months prior to the study. No Yes - Only Spanish classes studying Spanish as a third language in grade 8 in secondary schools (academic track schools, G8) were eligible to participate. Another condition was the use of the textbook "¡Vamos! ¡Adelante! Curso Intensivo 1" (Barquero et al., 2016), in order to control for the vocabulary and grammar they had learned in the months prior to the study. No

**Comments:**

Of the 217 schools contacted in the federal state of Baden-Württemberg, 20 teachers of Spanish as a third language in Grade 8 (G8 system) who use the textbook "¡Vamos! ¡Adelante! Curso Intensivo 1" (Barquero et al., 2016) expressed their willingness to participate. Due to scheduling constraints during the main intervention period from May to July, 17 classes in 15 schools comprising a total of 330 students were ultimately included in the study.

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**Section VI: Outcomes (Input)**

**Confirmatory question 1: Outcome Measure 1**

**Outcome domain:** Student Achievement- cloze test prepositions (Three versions A-B-C, split half methodology (Albert & Marx, 2016, 133)) and writing task

**Minimum detectable effect size:** 0.275

**Outcome measure:** Number of correct prepositions / Number of correct prepositions and articles in the cloze test (t2-t3 and t3-t4)

**Scale of outcome measure:** Continuous

**Normed or state test:** No

**Test-retest reliability:** N/A

**Internal consistency:** N/A

**Inter-rater reliability:** N/A

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**Same outcome measure in treatment and comparison groups:** Yes

**Confirmatory question 1: Outcome Measure 2**

**Outcome domain:** Student Achievement- cloze test prepositions (Three versions A-B-C, split half methodology (Albert & Marx, 2016, 133)) and writing task

**Minimum detectable effect size:** 0.275

**Outcome measure:** Number of correct prepositions / Number of correct prepositions and articles in writing task (t3-t4)

**Scale of outcome measure:** Continuous

**Normed or state test:** No

**Test-retest reliability:** N/A

**Internal consistency:** N/A

**Inter-rater reliability:** N/A

**Same outcome measure in treatment and comparison groups:** Yes

**Confirmatory question 2: Outcome Measure 1**

**Outcome domain:** Student Achievement- cloze test prepositions (Three versions A-B-C, split half methodology (Albert & Marx, 2016, 133))

**Minimum detectable effect size:** 0.275

**Outcome measure:** Number of correct prepositions / Number of correct prepositions and articles in the cloze test (t1-t2) compared to (t2-t3)

**Scale of outcome measure:** Continuous

**Normed or state test:** No

**Test-retest reliability:** N/A

**Internal consistency:** N/A

**Inter-rater reliability:** N/A

**Same outcome measure in treatment and comparison groups:** Yes

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**Section VII: Analysis Plan**

**Baseline data collected prior to start of intervention:**

Yes

**Description of baseline data:**

We have baseline data for all aspects mentioned in the research questions.

**Covariates you plan to include in the model:**

Gender, Adapted version of "The Language Experience and Proficiency Questionnaire (LEAP-Q)" (Marian et al., 2007), Adapted version of the "Multilingual Strategy Inventory for Language Learning (M-SILL)" (Dmitrenko, 2017), Adapted version of the C-test (Grotjahn, 2014) with texts from units 1-3 of the target textbook, Age, digital version of the operation span task (OSPAN) (Hicks et al., 2016; Ruiz et al., 2019), Student Pretest

**Analytic model:**

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**Plan to handle cases with missing outcome data:**

full information maximum likelihood estimation

**Planned multiple comparisons adjustment, confirmatory question 1 (Student Achievement):**

No

**Comments:**

Regarding multiple comparisons, see statistical analysis plan

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**Section VIII: Additional Information**

**Links:**

No links have been added yet.

**Files:**

File Name: [MultiCon\\_Statistical\\_Analysis\\_Plan\\_Preregistration.pdf](#)

Description:

File Name: [MultiCon\\_Poweranalysis\\_Preregistration.R](#)

Description:

**Comments:**

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