Mango Languages Efficacy Study

FINAL REPORT

RESEARCH TEAM

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EXECUTIVE SUMMARY

The Research Team independently conducted this study from July to September 2019. A random representative sample of 95 novice Spanish learners participated in the study. The participants took one set of Spanish language written and oral proficiency tests in the beginning of the study, then studied Spanish with Mango Languages for two months and took the same tests again. The improvement in language proficiency was measured as the difference between the final and the initial test results. The Efficacy of Mango Languages was measured as improvement per one hour of study.

MAIN RESULTS

Overall Written Proficiency Gain:

- Overall 82% of the participants improved their written proficiency[3] during the study;
- Novice users need on average 15 hours of study in a two-month period to cover the requirements for one college semester of Spanish;

Overall Oral Proficiency Gain:

- Overall 77% of all study participants increased their oral proficiency[4] during the study;

Oral Proficiency Gain for Participants with 8 Hours of Study or More:

- 85% of the participants increased their TNT oral proficiency[4];
- 74% of the participants increased their TNT-ACTFL estimation[5] level;
- 72% of the participants increased their TNT-CEFR estimation[6] level;

Efficacy:

- On average participants gained 18 written proficiency WebCAPE points per one hour of study;
- On average participants gained 0.13 points of the TNT oral proficiency test per one hour of study;

User Satisfaction:

- The majority of participants thought that Mango Languages was easy to use (95%), helpful (88%), enjoyable (91%), and satisfying (84%);
- Mango Languages received a positive Net Promoter Score of +42 from the participants;
- Mango Languages efficacy was not affected by gender, age, education, native language, etc.;
- Participants' motivation was very high with average level of 82%;

[3] Based on the college placement test WebCAPE.
[4] Based on TrueNorth (TNT) oral proficiency test.
[5] TNT estimation of American Council for Teaching Foreign Languages (ACTFL) levels.
[6] TNT estimation of Common European Framework of Reference for Languages (CEFR) levels.

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INTRODUCTION

This is a study designed to evaluate the efficacy of Mango Languages[7].

The company describes Mango Languages as follows:

"Since 2007, Mango Languages has built an award-winning learning environment around its core purpose to enrich lives with language and culture. With powerful teaching methodology based on research in Second Language Acquisition, Mango's learning system prepares learners to speak confidently in real-life situations. Mango is the leading provider of language software in North American public libraries and is used by individuals and organizations around the world. Learners can choose from over 70 world languages and over 20 ESL courses, available on iOS, Android, and the web. Key features include:

- Conversation-based methodology that breaks up conversations into manageable chunks, then guides learners to build them back up again, challenging them to use what they learn to produce new phrases and sentences;
- Carefully designed content that aligns with internationally recognized proficiency levels and standards, so that learners can accurately understand their progress;
- Language content created and recorded by native speakers for clear, high-quality language input;
- Notes to explain difficult language concepts and put language learning in the context of culture;
- Color mapping between the learners' target and native languages to help learners understand the structure of the target language;
- Phonetic transcriptions, slow-paced recordings, and a voice comparison tool to help learners hone their pronunciation;
- Authentic passages for extra practice with reading and listening comprehension.
- A spaced-repetition algorithm that optimizes transferring words and phrases to long-term memory."

This study was funded by Mango Languages, but the data collection and the analysis were carried out independently by the Research Team. The language tests used in the study were designed and developed by external independent testing companies.

[7] www.MangoLanguages.com

RESEARCH DESIGN

The random sample for this study was drawn from existing Mango Languages users residing in the U.S. There were some additional requirements for the potential participants, who had to:

- be willing to study Spanish using only Mango Languages for two months. The minimum requirement was a total of 2 study hours for the two-month period.
- take two sets of written and oral proficiency language tests;
- be at least 18 years of age;
- be novice or beginner learners of Spanish.

Sample Size and Power Analysis

We based our power and sample size calculations on the typical results from our previous studies (Rosetta Stone, italki, Babbel, and Busuu), using SAS 9.4[8] PROC POWER procedure. We can assume a minimum WebCAPE average gain of 80 points and a standard deviation up to 160 points. With a 5% statistical significance level (alpha=0.05) and at least 80% power, a sample size of 30 participants of more will be sufficient to test for statistical significance of the WebCAPE gain.

For the oral proficiency we can assume at least 60% improvement based on our previous studies. A sample size of 30 participants or more will be sufficient to test for statistical significance of the oral proficiency improvement as well.

To be consistent with our previous studies, we will perform a separate analysis only for participants with 8 study hours of more. In our previous studies about 30%-40% of the participants reached 8 study hours. In addition, we expect that about 30% of the participants will not complete the study for different reasons.

Our initial sample size was set to 150 in order to reflect possible dropouts from the study and the separate analysis for participants with 8 hours or more.

Spanish language was selected for this study because it is one of the most popular languages studied by users of language learning apps, and for comparability with previous research on Spanish for other language learning apps (Vesselinov & Grego, 2009-2019[9]). The study lasted approximately 8 weeks and was conducted between July and September 2019. Participants who successfully completed

[8] https://www.sas.com/
[9] Except Hello English study in 2017.

the study were given one-year of free access to Mango's All Languages Package: the participant and five of their friends were given unlimited access to all of Mango's 70+ languages, as well as other Mango products and features. Participants with 8 study hours or more additionally received a package of Mango merchandise (2 pens, 2 notebooks and a water bottle). No other incentives were offered to the participants.

Study Instruments

Test 1. WebCAPE: Written Proficiency: Vocabulary/Reading/Grammar

We used a college placement test called the Web based Computer Adaptive Placement Exam (WebCAPE). This is an established university placement test and is offered in English, Spanish, French, German, Russian and Chinese. It was created by Brigham Young University and is hosted by Emmersion Learning[10].

The WebCAPE has a very high validity correlation coefficient (0.91) and very high reliability (test-retest) value of 0.86[11]. The test is adaptive so the time for taking the test varies with an average time of 20-25 minutes. The WebCAPE gives a score (in points) and based on that score places the students in different group levels (college semesters; see Table 1).

Table 1. Spanish WebCAPE Cut-off Points

WebCAPE Points	College Semester Placement
Below 270[12]	Semester 1
270-345	Semester 2
346-428	Semester 3
Above 428	Semester 4+

The WebCAPE results alone cannot give a clear picture of the efficacy of a language learning app because they do not account for the time spent studying. We are therefore relying on a direct and objective measure of efficacy, which is defined as follows:

Efficacy=Improvement per one hour of study.

$$\text{Efficacy} = \frac{\text{Effect}}{\text{Effort}} = \frac{\text{Improvement of language skills}}{\text{Study time}} = \frac{\text{Final-Initial WebCAPE test score}}{\text{Hours of study}}$$

[10] Currently WebCAPE is still listed with their old host at https://perpetualworks.com/
[11] https://perpetualworks.com/webcape/details/
[12] The same threshold of 270 points (four-semester Spanish) was used for all our previous language studies.

A similar efficacy measure will be computed for oral proficiency, using the TrueNorth Test score described below.

The efficacy measure includes both the amount of progress made and the amount of effort invested by each study participant. This is a direct and objective measure of efficacy: direct, because it includes directly the effect and the effort; objective, because the effect is measured by an independent college placement test (instead of our own test) and the effort is measured by the time recorded on the computer servers (instead of self-report).

Test 2. TrueNorth Test (TNT)[13]: Oral Proficiency Test

This is a newly developed oral proficiency test based on Elicited Imitation (EI) as a testing method in which participants hear an utterance in the target language and are prompted to repeat the utterance as accurately as possible.

a. TNT oral proficiency score.

The TNT test gives an incremental score from 0.0 to 10.0 with zero being the lowest level and 10 – the highest.

TNT also provides estimation of ACTFL[14] and CEFR[15] levels.

b. TNT-ACTFL estimation of oral proficiency.

The American Council for Teaching Foreign Languages (ACTFL) developed a proficiency scale to assess foreign language abilities. This scale includes four main groups[16] (Novice, Intermediate, Advanced, and Superior), with the first three divided into levels. The levels are shown below:

Novice: 1. Low 2. Mid 3. High

Intermediate: 4. Low 5. Mid 6. High

Advanced: 7. Low 8. Mid 9. High

10. Superior (no levels)

[13] TrueNorth Test, https://truenorthtest.com

[14] TrueNorth Technical Report: https://truenorthtest.com/wp-content/uploads/2019/09/Spanish-Technical-Report_2019.9.16.pdf

[15] Emmersion Learning, Inc.: "Crafted by PhD Psychometricians using patent-pending methods that correlate with standard scales (CEFR & TOEFL)", https://truenorthtest.com/about/

[16] https://www.actfl.org/publications/guidelines-and-manuals/actfl-proficiency-guidelines-2012

c. TNT-CEFR estimation of oral proficiency.

The Common European Framework of Reference for Languages (CEFR)[17] is designed as a global standard for describing language proficiency. It has six levels, A1-A2 for beginner, B1-B2 for intermediate, and C1-C2 for proficient.

STUDY SAMPLE

In July 2019, emails were sent to existing Mango Languages users with an invitation to participate in a Spanish language study for two months. They were directed to an online survey designed by the Research Team. This survey collected demographic information, and self-evaluation of their language proficiency level. We received complete responses from 467 people which constituted the initial pool for the study. From this pool we excluded 47 people who lived outside the US, were younger than 18 years of age, or had an intermediate or high level of knowledge of Spanish; the remainder formed the eligible pool (N=420) for this study.

We randomly selected 150 people from the eligible pool of participants and 149 of them completed the initial language test. They constituted our initial random sample (N=149).

The Mango Languages study continued for approximately two months (8 weeks), starting in July 2019 and ending in September 2019. During the study, the Research Team sent weekly e-mail reminders to the participants with information detailing the amount of time they had used Mango Languages each week.

The final study sample consisted of 95 people who had at least two hours of study and had valid initial and final sets of tests.

All participants were instructed at the beginning of the study that they could use only Mango Languages to study Spanish for the duration of the study. In the exit survey eight people stated that they had regularly used other language apps or spoke and consulted regularly with native speakers of Spanish and were excluded from the final analyses. Other people had occasionally used internet dictionaries, YouTube or translation websites and they were included in the final analyses.

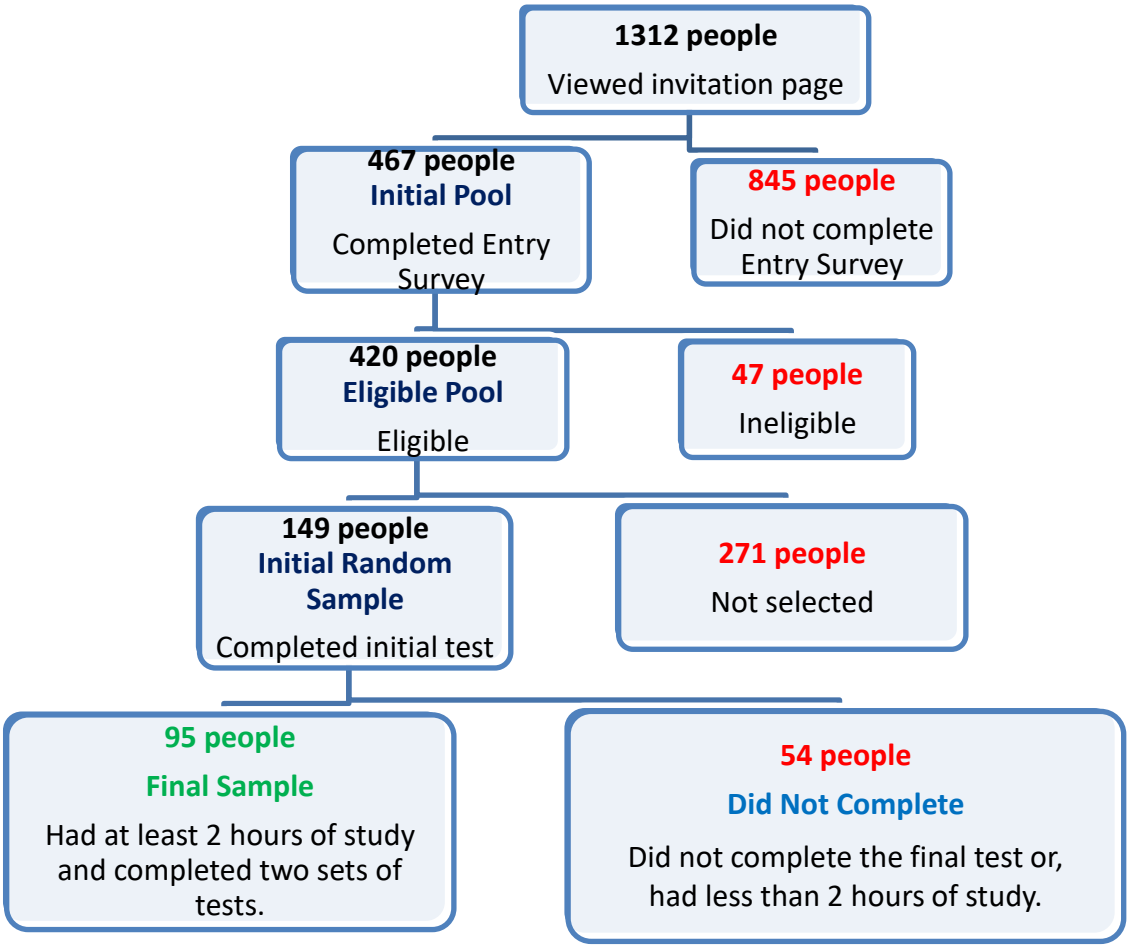
[17] https://www.coe.int/en/web/common-european-framework-reference-languages

Final Study Sample versus Not Completed

From the initial random sample (N=149), 54 people (36.2%) did not complete the study for two different reasons: 1) they did not take the final tests, or 2) they studied for less than 2 hours during the two-month study. This dropout rate is about average in this line of research.

We compared the two groups, the final sample of 95 people and the 54 people who did not complete the study by gender, age, education, employment status, initial knowledge of Spanish and reason for studying Spanish. There were no statistically significant differences, which means that participants who did not complete the study were not very different from the ones that did.

Figure 1. Sample Selection Tree



Sample Description

In the final study sample (N=95), 70.2% were female. In our previous studies we have found similar population phenomena: there are more female users of language apps willing to participate in research than male. Our analysis has shown that gender is not a statistically significant factor for language learning improvement. This study sample by design is representative of the population of people who seek to learn a foreign language with language apps. We know from previous studies that this special population is older, more educated, and has a higher proportion of female users (60%-70%) than the general population.

The age of participants varied from 21 to 66 years of age, with a mean age of 41.2 years. The participants were very well educated with a majority of them having at least some college experience, or an undergraduate or graduate degree.

Figure 2. Age Distribution

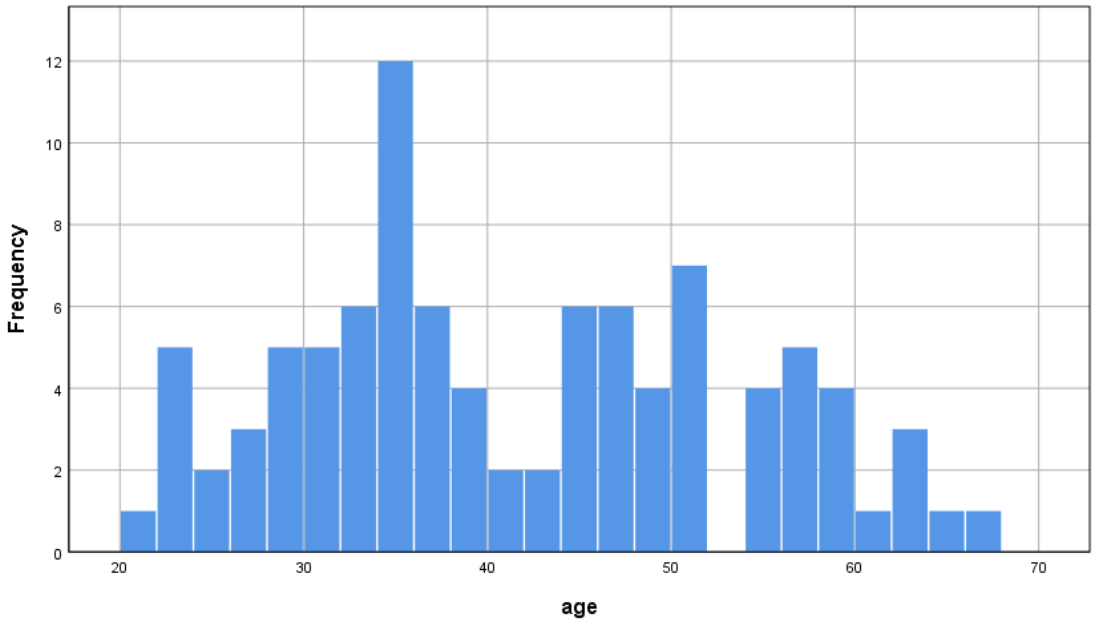


Table 2. Age and Gender Distribution

Age	Female (N)	Male (N)	Total (N)	Total (%)
21-30 years old	14	4	18	19.1
31-40 years old	26	6	32	34.0
Over 40 years old	26	18	44	46.9
Total	**66**	**28**	**94***	**100**

* Some participants declined to answer specific survey questions, so the number of answers can be less than 95 in some tables in this report. The number of answers is reported in the tables.

Table 3. Education

Category	N	Percent
2. HS diploma or equivalent	5	5.3
3. Some college but no degree	10	10.6
4. College graduate, BA or equivalent	31	33.0
5. Some graduate school but no degree	7	7.4
6. Master's degree (MA, MS)	34	36.2
7. PhD/MD/JD	7	7.4
Total	**94**	**100**

The majority of the people were employed full time (60.6%).

Table 4. Employment Status

Category	N	Percent
1. Employed full time	57	60.6
2. Homemaker	12	12.8
3. Employed part time	9	9.6
4. Unemployed	4	4.3
5. Retired	5	5.3
6. Other employment	4	4.3
7. Student	3	3.2
Total	**94**	**100**

Eighty-seven percent of the participants were English native speakers and the rest included native speakers of the following languages: Arabic, Bahasa Malaysia, Bahasa Indonesia, Kristang, French, Haitian Creole, Hebrew, Mandarin, Russian, Shona, and Tagalog.

All participants in the final sample described themselves as beginner or novice Spanish learners. About 28% of the respondents had a spouse, partner, or close friends who spoke Spanish. About 3% had parents, grandparents, or great-grandparents who spoke Spanish.

About 71% of the final sample had studied a foreign language before (mostly at high school or college).

About 24% had lived outside the U.S. in a non-English speaking country for more than 6 months. About 19% of the respondents were raised in a multilingual or non-English speaking household.

The primary reason for studying Spanish among participants was personal interest (49.5%), followed by business or work (30.5%) and travel (15.8%).

Table 5. Reason for Studying Spanish

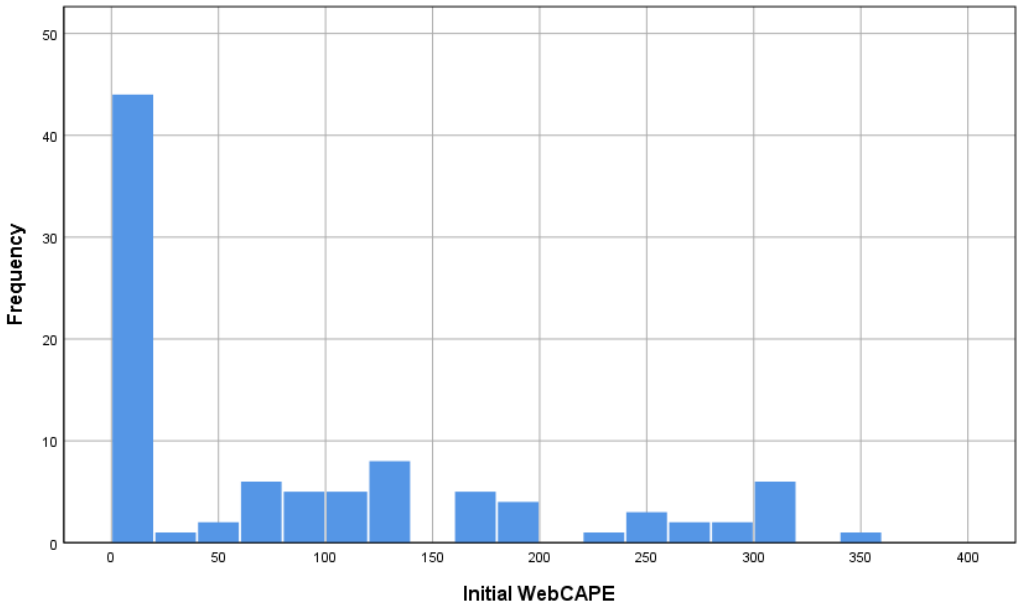
Category	N	Percent
1. Personal Interest	47	49.5
2. Business/Work	29	30.5
3. Travel	15	15.8
4. Other	3	3.0
5. School	1	1.1
Total	**95**	**100**

Initial Language Tests

Test 1. Written[18] proficiency: WebCAPE

All participants took an initial written proficiency test (WebCAPE) and the results are as follows.

Figure 3. Initial WebCAPE Score



As expected, a large portion of the participants (45%) scored zero on the first WebCAPE. The overall median WebCAPE score was 60 (IQR[19]=161) corresponding to first college semester of Spanish.

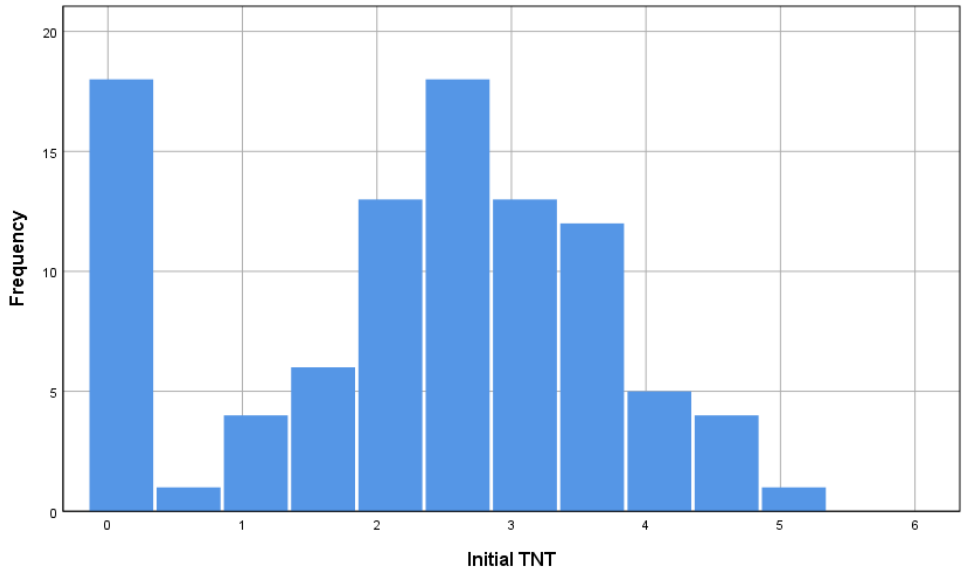
Test 2. Oral Proficiency:

a. TNT Score.

TNT scores can vary from 0.0 to 10.0, and the initial test scores ranged from 0.1 to 5.2. The overall median value was 2.7 (IQR=1.9) with 18% scoring very close to zero (0.1).

[18] Reading/Grammar/Vocabulary
[19] Interquartile Range= Third Quartile – First Quartile

Figure 4. Oral Proficiency: TNT Score.



TNT test offers estimates of ACTFL[20] and CEFR[21] levels. The initial TNT-ACTFL and TNT-CEFR estimated levels are shown in Tables 6 and 7, respectively.

b. TNT-ACTFL estimation of oral proficiency.

Table 6. Initial TNT-ACTFL Estimation Levels

Level	Description	N	Percent
1.0	Novice Low	20	21.1
1.5	Novice Low-Novice Mid	12	12.6
2.0	Novice Mid	0	0
2.5	Novice Mid – Novice High	30	31.6
3.0	Novice High	0	0
3.5	Novice High – Intermediate Low	24	25.3
4.0	Intermediate Low	0	0
4.5	Intermediate Low - Intermediate Mid	8	8.4
5.0	Intermediate Mid	0	0
5.5	Intermediate Mid - Intermediate High	1	1.1
6.0	Intermediate High	0	0
	Total	95	100

[20] TrueNorth Technical Report: https://truenorthtest.com/wp-content/uploads/2019/09/Spanish-Technical-Report_2019.9.16.pdf

[21] Emmersion Learning, Inc.: “Crafted by PhD Psychometricians using patent-pending methods that correlate with standard scales (CEFR & TOEFL)”, https://truenorthtest.com/about/

c. TNT-CEFR Estimation of Oral Proficiency

Table 7. Initial TNT-CEFR Levels

Level	Description	N	Percent
1.0	Beginner A1	32	33.7
1.5	Beginner A1 – A2	30	31.6
2.0	Beginner A2	24	25.3
2.5	Beginner A2 – Intermediate B1	8	8.4
3.0	Intermediate B1	1	1.1
	Total	95	100

Motivation

All participants completed a motivation scale in the beginning of the study to evaluate the role of motivation on efficacy.

We adopted a motivation scale approach largely based on the second language (L2) motivational self-system (Dörnyei, 2005, 2009) which stems largely from the concepts of possible selves and self-discrepancy theory. The model proposes that language learners are guided by visions of 'second language selves', one which attracts them toward becoming an idealized L2 user (ideal L2 self) and one which pushes them from societal obligation or a fear of failure (ought-to L2 self).

We adopted a specific 33 question/6 factor version of L2 Motivational Self System (see Appendix, Table A2) created by Kong et al. (2018).

Kong et al. (2018) offer the following descriptions of the motivation scale elements:

1. Ideal L2 self: "The ideal L2 self refers to a positive future image of the L2 self. For example, learners who have developed a vivid ideal L2 self are likely to endeavor to learn an L2 by imagining themselves communicating fluently using the L2 in the future."

2. Ought-to L2 self: "(*This element*) pushes people from societal obligation or a fear of failure."

3. International posture: "It captures a tendency to relate oneself to the international community rather than any specific L2 group. The key characteristics of international posture are described as an interest in global issues or international affairs, a willingness to travel, stay, or work abroad, and a readiness to interact with foreigners or foreign cultures."

4. Competitiveness: “Competitiveness can be described as the desire to excel in comparison to others and contends that a learner constantly compares oneself with one's idealized self-image or with other learners, feels pressured to out-do other students.”

5. L2 learning Experience or Attitudes: “L2 learning experience is related to the learners' environment including teachers, peer groups, curriculum, and their attitudes toward L2 learning.”

6. Learners' Intended Effort or Motivated Behavior in L2 Learning: This motivation element evaluates how much effort users are determined to make and how hard they are ready to study.

Sixty-eight participants completed the motivation survey. As we can see from the table below and Figures 6 to 11 below, the participants’ motivation is very high. The scale dimensions were re-coded, so the maximum motivation is equal to 100.

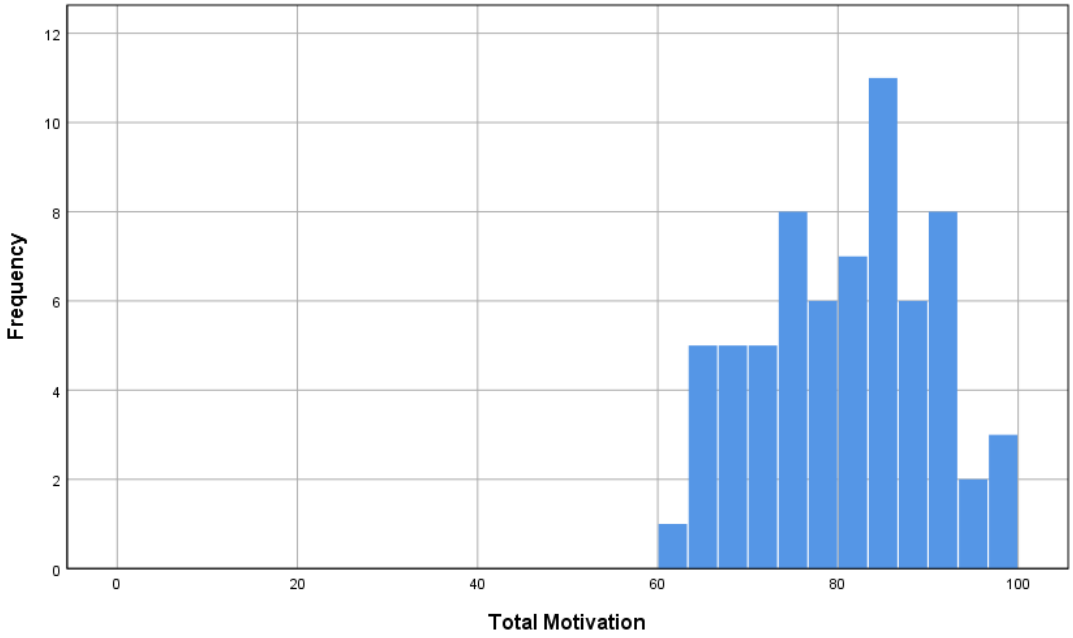
Table 8. Motivation Levels (N=68) (%)

Motivation Dimensions	1st Quartile[22]	Median[23]	3rd Quartile[24]
1. Ideal Self	75	80	95
2. Ought-to-Self	49	63	80
3. International Posture	77	83	90
4. Competitiveness	74	83	90
5. Learning Attitude	80	95	100
6. Intended Effort	77	87	93
Overall Motivation	**74**	**82**	**88**

The average level of the overall motivation was very high (Median=82%). From the motivation elements the highest level (95%) belongs to “Learning Attitude” which indicates that the participants were extremely eager to learn a new language. The element “Ought-to-Self” has the lowest level of all (63%) which suggests that the participants were not very afraid of failure or they were not that susceptible to pressure from societal obligation.

[22] First 25% of the sample.
[23] 50% middle point.
[24] First 75% of the sample.

Figure 5. Total Motivation Level (%)



As noted above, the average initial level of motivation was very high, and most people were overall highly motivated. The lowest individual motivation level was 63%.

MOTIVATION LEVELS:

Figure 6. L2 Motivation (Max=100)
M1 "Ideal Self"

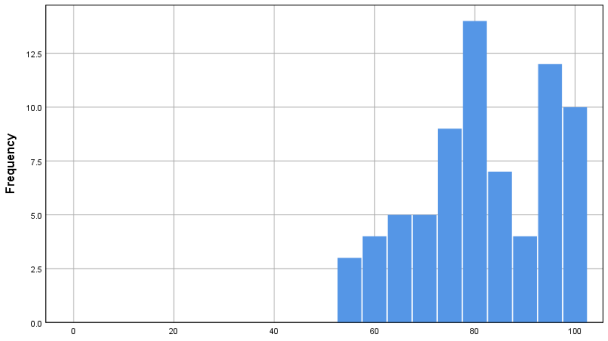


Figure 7. L2 Motivation (Max=100)
M2. "Ought-to Self"

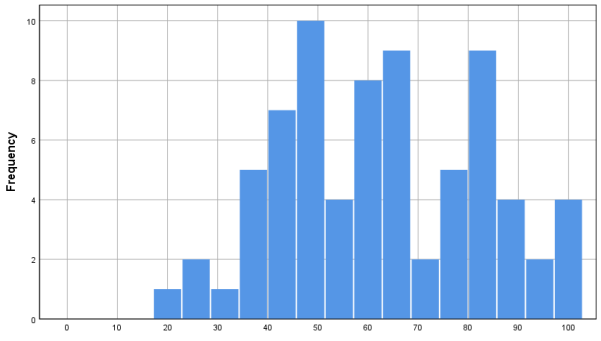


Figure 8. L2 Motivation (Max=100)
M3. "International Posture"

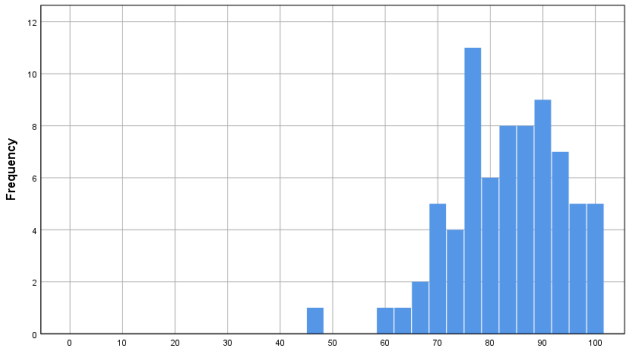


Figure 9. L2 Motivation (Max=100)
M4. "Competitiveness"

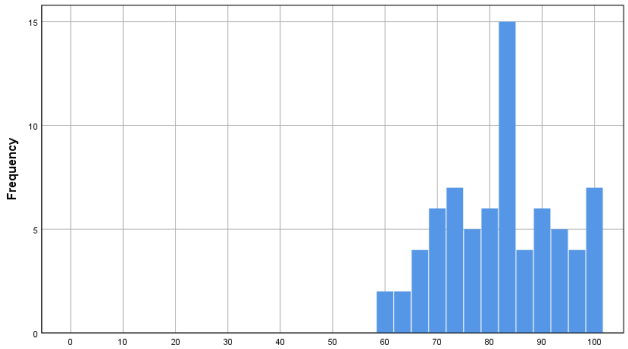


Figure 10. L2 Motivation (Max=100)
M5. "Learning Attitude"

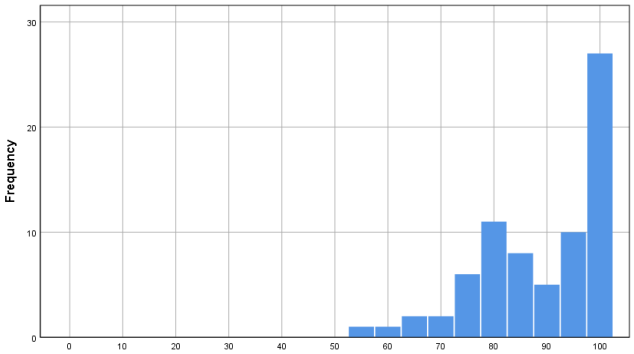
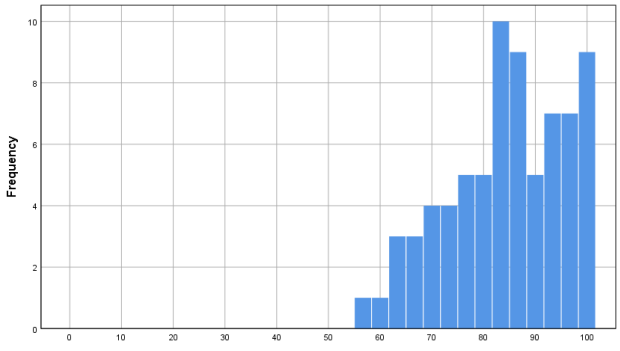


Figure 11. L2 Motivation (Max=100)
M6. "Intended Effort"

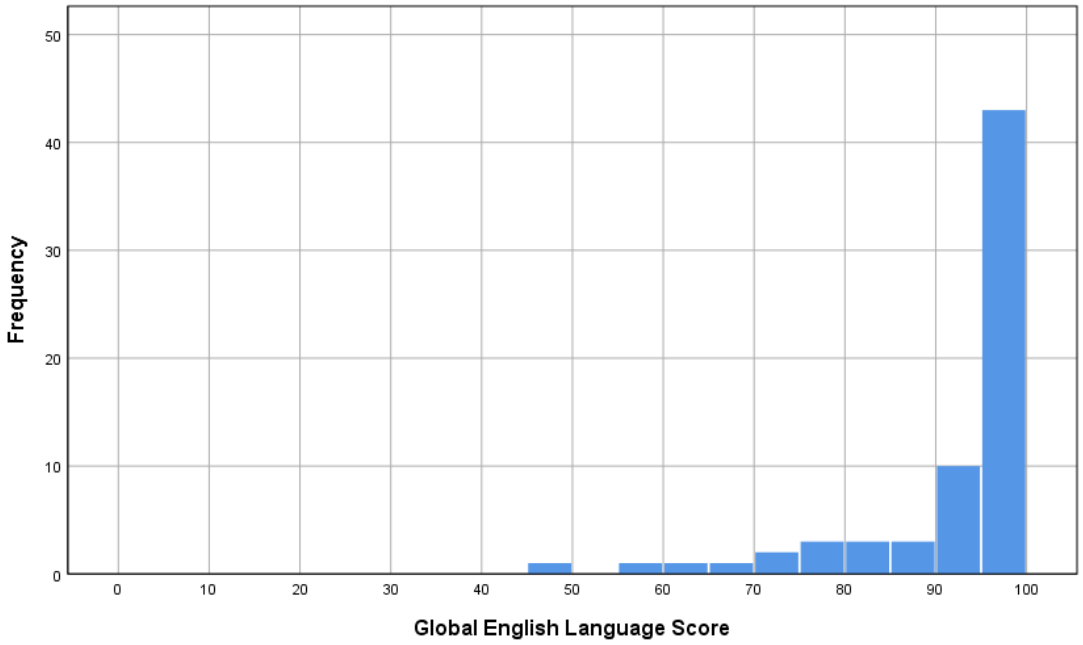


Language Profile

We asked participants to complete an adapted version of the Bilingual Language Profile (Birdsong et al., 2012). This provides a Global Language Score (GLS) for English and for additional languages spoken by the participants. GLS is based on separate modules for evaluating language history, language use, language proficiency and language attitudes. GLS can vary from 0 to 218, and we re-coded it, so the maximum is equal to 100.

For example, a GLS score of 218 (or rescaled as 100) would be appropriate for participants born into an English-speaking family, in an English-speaking country, who started studying English immediately, for whom all classes at school were in English, who speak only English all the time with family, friends, and at work. Their language history and language use are entirely English- based. They feel totally proficient in English, and they identify themselves with an English-speaking culture.

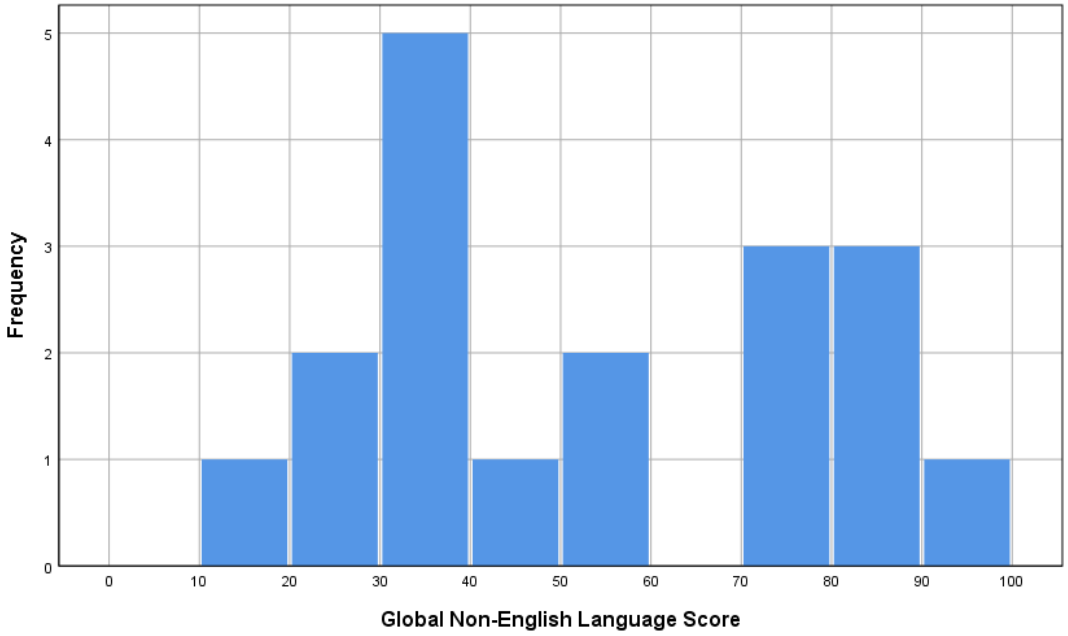
Figure 12. GLS Score for English Language (N=68) Max=100



The median English GLS percent was 97 (IQR=6.6) which corresponds to an initial sample of very strong English native speakers. Eighteen participants felt comfortable enough to complete the language profile for another language in addition to English.

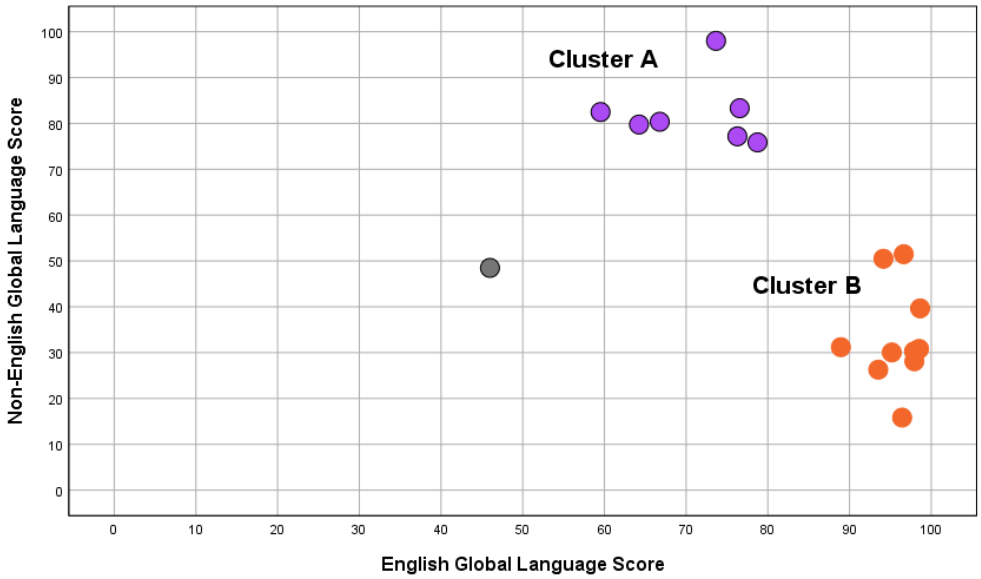
The GLS score is lower if the participants started learning English at older age, attended school with some instruction in a language other than English, or used another language to speak with some of their friends and family, etc.

Figure 13. GLS Score for Language other than English (N=18) Max=100



The median GLS level for language other than English was 49 (IQR=50).

Figure 14. English vs Non-English GLS (n=18)



Participants with two languages fall mainly into two groups (Fig. 14):

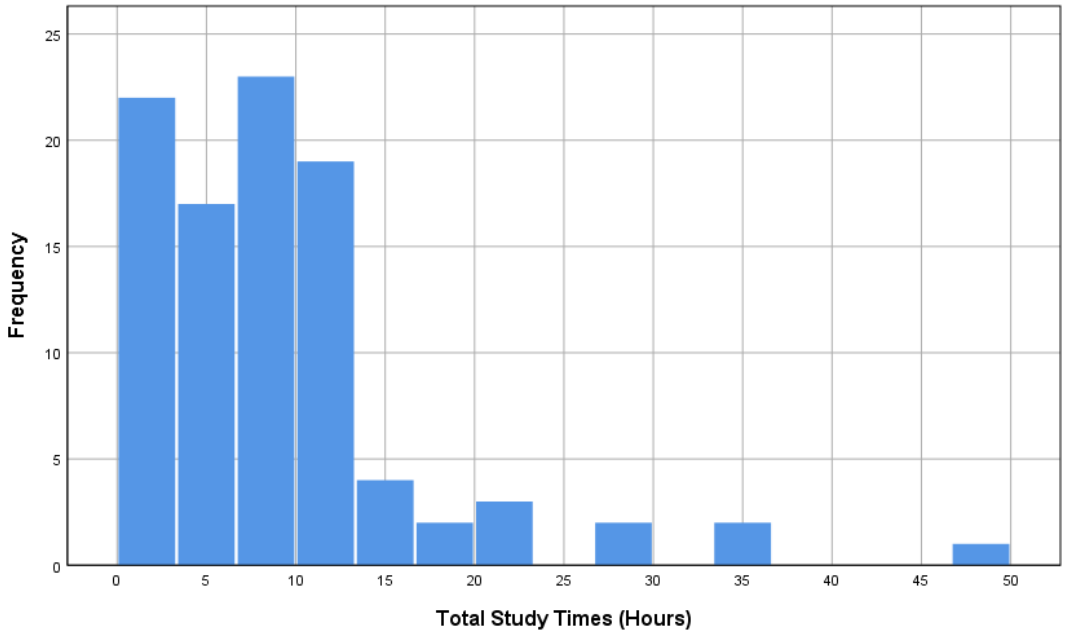
Cluster A: they have a less than perfect English profile (English GLS 60-80%), but they have strong profile in another language, i.e. their native language (Non-English GLS 80-100).

Cluster B: they are native speakers of English (English GLS 90-100%) and have some knowledge of a second language (Non-English GLS 20-50%).

Study Time

We measured the study time objectively by the actual server time on a weekly basis and we reported the time to the participants regularly via e-mail in order to encourage them to keep studying. The average total study time for the final study sample (N=95) was about nine hours, or a little over one hour per week. The total study time ranged from two hours to 48 hours.

Figure 15. Study Time Distribution Hours



LANGUAGE IMPROVEMENT

Written Proficiency Results

All participants took the initial WebCAPE before the start of the study and then again at the end of the study. We measured the progress or improvement as the difference between the final test score and the initial one.

Figure 16. WebCAPE Gain (n=87)

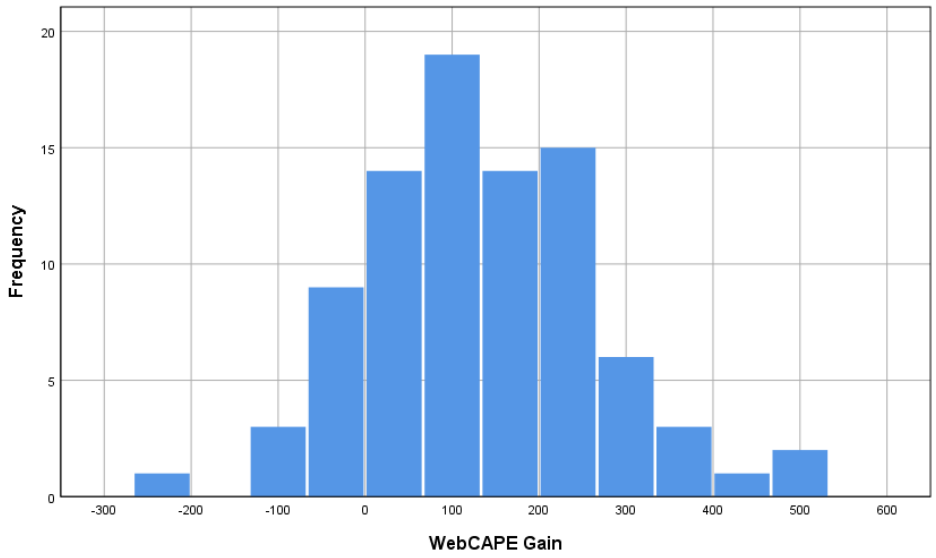


Table 9. Language Improvement (Reading/Vocabulary/Grammar)

WebCAPE Points (n=87)

Statistics	Initial WebCAPE	Final WebCAPE	Improvement (Final-Initial)
Mean (std)	97.2 (106.9)	229.4 (120.5)	132.2 (124.0)
95% Confidence Interval	74.4 – 120.0	204 – 255	104 – 161

The average overall improvement of 132 WebCAPE points was statistically significant with a 95% confidence interval from 104 to 161 points. This means that the improvement in the language proficiency for the final sample was statistically significant (at 5% error). Overall 82% of all participants improved their written language proficiency with a 95% Confidence interval[25] of 72% to 88.4%.

[25] 95% CI with Agresti-Coull correction (Agresti & Coull, 1998).

Only 16 participants out of 87, or 18% did not increase their WebCAPE score. There are two plausible explanations for this fact. First, some participants scored higher on the initial test and gaining points at this higher level is generally more difficult and requires more time. Second, some participants studied irregularly with more effort and more study time in the beginning of the study and less time towards the end of the study, so they may have forgotten what they learned due to lack of continued practice.

College Semester Placement

We can measure progress by movement from an initial semester level to a final semester level with the results presented below.

Table 10. WebCAPE Semester Placement

College Semester	Initial Test		Final Test	
	People (N)	%	People (N)	%
First	77	88.5	54	62.1
Second	9	10.3	21	24.1
Third	1	1.1	7	8.0
Fourth+			5	5.7
Total	87	100	87	100

Participants at First Semester level decreased from 88.5% to 62.1% and the proportion in Second to Fourth+ Semester level increased notably.

Table 11. Semester Improvement

Level (Semester Change)	Improved		Study Time
	People (N)	%	Mean (Hours)
-1 Negative change	3	3.2	Small n
0 Same/No Change	55	63.2	8.7
1 One Semester Up	18	20.7	10.3
2 Two Semesters Up	8	9.2	15.3
3 Three Semesters Up	3	3.4	Small n
Total	**87**	**100**	**10.0**

People who did not improve their semester placement studied the least (8.7 hours) while people with a two-semester improvement studied the most (15.3 hours).

The problem with the semester improvement measure is that first, it does not account for the effort (study time) and second, moving up a semester is dependent on the exact initial level. For example, if a person initially has 269 test points (First semester), only one-point progress is

needed to move to Second semester. Another person can start with 10 points (First semester), then gain 200 points and the new level (210 points) is still First Semester. This measure is not very informative, and it is presented here only for completeness.

Oral Proficiency Results

Test 2. TNT Oral Proficiency

a. TNT score

Figure 17. Oral Proficiency: TNT Score Gain (n=87)

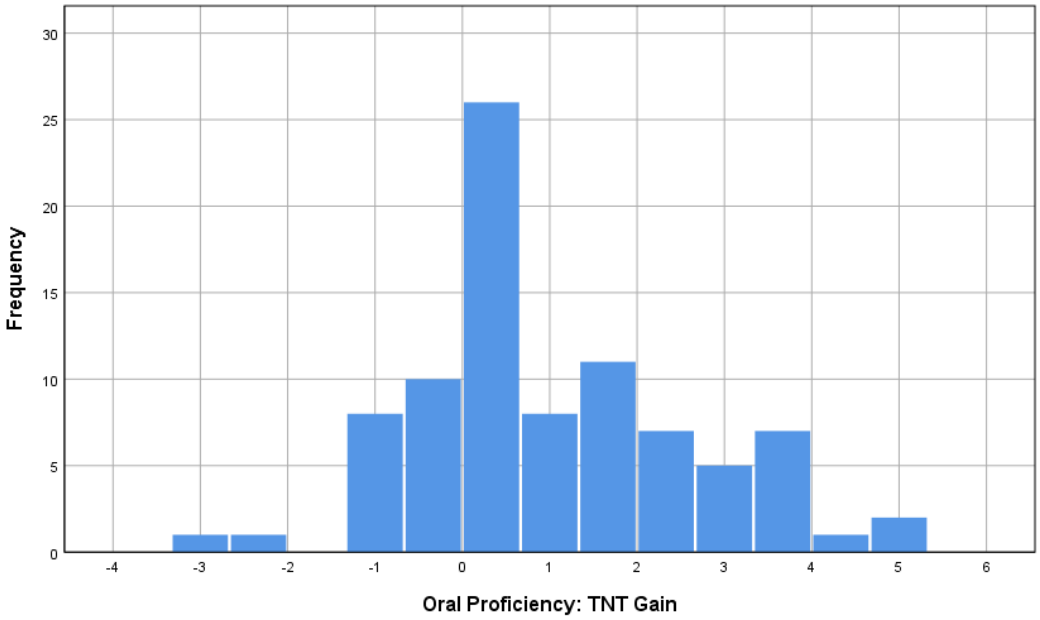


Table 12. Language Improvement. Oral Proficiency by TNT score (n=87)

TNT Test Points

Statistics	Initial TNT	Final TNT	Improvement (Final-Initial)
Mean (std)	2.4 (1.4)	3.4 (1.1)	1.1 (1.6)
95% confidence interval	2.1 – 2.7	3.2 – 3.7	0.7 – 1.4

The average overall oral proficiency improvement of 1.1 TNT test points was statistically significant with a 95% confidence interval from 0.7 to 1.4 points. Overall 77% of all participants improved their oral proficiency with 95% confidence interval[26] of 67% to 84.6%.

[26] 95% CI with Agresti-Coull correction (Agresti & Coull, 1998).

Oral Proficiency by TNT for Participants with 8 Hours of Study

Language Testing International, the exclusive licensee of ACTFL recommends[27] 8 weeks as the minimum time between test and retest for Group I languages which includes Spanish. In our previous studies we used ACTFL computerized oral proficiency test (OPIc) and we required at least 8 hours for 8 weeks of study for oral evaluation. In order to make the results of this study comparable to the previous studies we present similar results here.

Table 13. Oral Proficiency by TNT for People with 8 Hours of Study (n=46)

	TNT Test Points		
Statistics	**Initial TNT**	**Final TNT**	**Improvement (Final-Initial)**
Mean (std)	2.2 (1.3)	3.7 (1.0)	1.4 (1.5)
95% confidence interval	1.9 – 2.6	3.4 – 4.0	1.0 – 1.9

The average overall oral proficiency improvement of 1.4 TNT test points was statistically significant with a 95% confidence interval from 1.0 to 1.9 points. This means that the improvement in the oral proficiency for the final sample was statistically significant (at 5% error). Overall 84.8% of all participants improved their oral proficiency with a 95% confidence interval[28] of 71.4% to 92.6%.

[27] https://www.languagetesting.com/how-long-does-it-take

[28] 95% CI with Agresti-Coull correction (Agresti & Coull, 1998).

b. TNT-ACTFL Estimation

Comparable to the previous study, we consider oral proficiency by TNT-ACTFL estimation only for participants with 8 hours of study or more.

Table 14. Oral Proficiency by TNT-ACTFL Estimation for People with 8 Hours of Study

Level	Description	Initial		Final	
		N	Percent	N	Percent
1.0	Novice Low	10	21.7	0	0
1.5	Novice Low-Novice Mid	5	10.9	3	6.5
2.0	Novice Mid	0	0	0	0
2.5	Novice Mid – Novice High	15	32.6	4	8.7
3.0	Novice High	0	0	0	0
3.5	Novice High – Intermediate Low	14	30.4	21	45.7
4.0	Intermediate Low	0	0	0	0
4.5	Intermediate Low - Intermediate Mid	2	4.3	13	28.3
5.0	Intermediate Mid	0	0	0	0
5.5	Intermediate Mid - Intermediate High	0	0	5	10.9
6.0	Intermediate High	0	0	0	0
	Total	46	100		100

Table 15. Oral Proficiency Increase by TNT-ACTFL Estimation (Final – Initial)

Gain	Description	n	Percent
-1	Decreased one level	2	4.3
0	Stayed the same level	10	21.7
0.5	Increased half level	0	0
1	Increased 1 level	14	30.4
1.5	Increased 1.5 levels	2	4.3
2	Increased 2 levels	9	19.6
2.5	Increased 2.5 levels	4	8.7
3	Increased 3 levels	2	4.3
3.5	Increased 3.5 levels	1	2.2
4	Increased 4 levels	0	0
4.5	Increased 4.5 levels	2	4.3
	Total	46	100

73.9 percent of the people with at least 8 hours of study increased their TNT-ACTFL estimation level by at least with one level and up to 4 levels. The 95% confidence interval[29] is from 59.6% to 84.4%. About 39% of the participants increased their oral proficiency with two or more levels.

[29] 95% CI with Agresti-Coull correction (Agresti & Coull, 1998).

c. TNT-CEFR Estimation

As with the case of TNT-ACTFL estimation, we considered the oral proficiency by TNT-CEFR estimation only for people with 8 hours of study or more.

Table 16. Oral Proficiency by TNT-CEFR Estimation

Level	Description	Initial		Final	
		N	Percent	N	Percent
1.0	Beginner A1	15	32.6	3	6.5
1.5	Beginner A1 – A2	15	32.6	4	8.7
2.0	Beginner A2	14	30.4	21	45.7
2.5	Beginner A2 – Intermediate B1	2	4.3	13	28.3
3.0	Intermediate B1	0	0	5	10.9
	Total	46	100	46	100

Table 17. Oral Proficiency by TNT-CEFR Estimation (Final – Initial)

Gain	Description	n	Percent
-0.5	Decreased half level	2	4.3
0	Stayed the same level	11	23.9
0.5	Increased half level	15	32.6
1	Increased 1 level	13	28.3
1.5	Increased 1.5 levels	3	6.5
2	Increased 2 levels	2	4.3
	Total	46	100

71.7 percent of the people with 8 study hours or more increased their TNT-CEFR estimation level up to 2 levels. The 95% confidence interval[30] is from 57.3% to 82.7%.

[30] 95% CI with Agresti-Coull correction (Agresti & Coull, 1998).

EFFICACY

Written Proficiency Efficacy

Table 18. Written Efficacy of Mango Languages (N=87)

Statistics	**Efficacy = Improvement per one hour of study** WebCAPE Points	**Time to cover the placement requirements for first semester of college Spanish** Hours
Mean (std)	18.3 (22.1)	14.8[31]
95% Confidence Interval	13.6 – 23.0	11.7 – 19.9[32]

On average Mango Languages users will gain 18 WebCAPE points per one hour of study with a 95% confidence interval of 14 to 23 test points per one hour of study.

The Mango Languages written efficacy is the improvement per one hour of study. In addition, if we divide the required cut-off point (270) for WebCAPE Second Semester placement by the mean efficacy, we can construct a new measure representing the time needed to cover the requirements for the first college semester of Spanish. This is the one measure of efficacy that is easy to understand and given the nature of the WebCAPE placement test, can be used for comparison with other language apps.

Based on this measure, Mango Languages users will need on average about 15 hours of study during a two-month period to cover the requirements for the first college semester of Spanish. The transformed lower and upper limits are from 12 to 20 hours of study during a two-month period.

[31] The threshold of 270 points divided by the mean efficacy (18.3 points).
[32] The threshold of 270 points divided by the lower limit (13.6) and the upper limit (23.0) of the 95% CI.

Oral Proficiency Efficacy

Table 19. Oral Efficacy of Mango Languages for Users with 8 Hours of Study (N=46)

Statistics	**Efficacy = Improvement per one hour of study** TNT Test Points	**Time to reach maximum TNT=10.0** Hours
Mean (std)	0.13 (0.14)	76.9[33]
95% confidence interval	0.08 – 0.17	58.8 – 125[34]

Regarding oral proficiency efficacy, it will take Mango Languages users on average 77 hours of study to reach the upper limit of the TNT test. The estimate's 95% confidence interval of this estimate is from 59 to 125 hours.

[33] TNT=10 divided by gain per hour (0.13)
[34] TNT=10 divided by the upper (0.17) and lower (0.08) limits of the 95% confidence interval

FACTORS FOR EFFICACY

Demographic Factors

We investigated the impact of several factors on language improvement (WebCAPE and TNT), namely age, gender, education, employment, device used, native language, knowledge of another foreign language, presence of people around the participant who spoke Spanish (spouse, friend, parents, grandparents), and reason for studying Spanish. None of these potential factors had a statistically significant effect on efficacy ($p<.05$).

This means that the Mango Languages app works similarly well for people regardless of gender, age, native language, education, employment status, etc.

Motivation Effect

We evaluated the effect of motivation on the oral and written language improvement. There was no statistically significant effect of the motivation score. One possible explanation is that the people in this study are highly motivated with an average level of motivation of 82 out of 100. At this high average level additional higher motivation does not have an effect of the results.

Language Profile Effect

English GLS does have a modest effect on written proficiency (Pearson $r=0.38$, $p=.002$). People with a better English language profile tend to have better WebCAPE results. The non-English language GLS does not have an effect on the written proficiency.

Neither English GLS nor non-English GLS had any effect on oral proficiency measured by TNT.

Initial Written and Oral Proficiency

As expected, this study confirmed the inverse relationship between the initial level of language proficiency and the gain in new knowledge (Figures 18 and 19). The biggest gain in new knowledge can be attributed to the novice/beginner users, while more advance learners gain test points slowly, both in written and oral proficiency. This is especially noticeable for oral proficiency: the regression line for oral proficiency is steeper than the one for written proficiency (regression coefficient -0.86 vs -0.64).

Figure 18. Initial Written Proficiency and Improvement

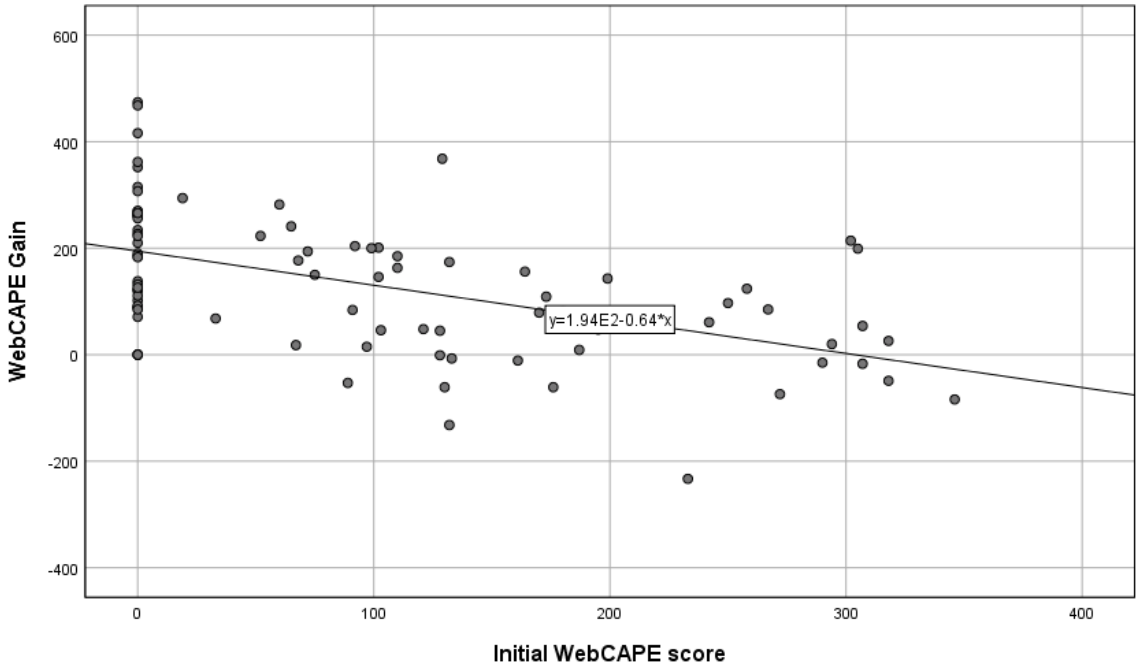
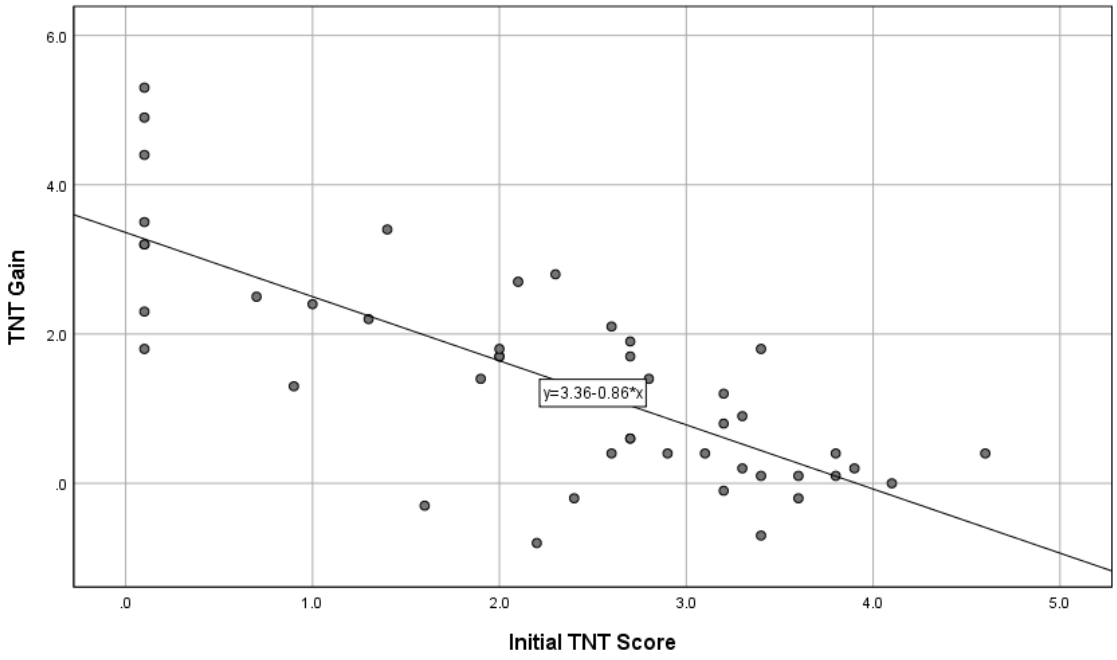


Figure 19. Initial Oral Proficiency and Improvement



USER SATISFACTION

After the study the participants were asked for their opinion about the Mango Languages program, specifically how easy it was to use, how helpful it was for learning Spanish, how enjoyable it was, and how much they were satisfied with it. The 5-point Likert scale was recoded into two categories: Strongly Agree/Agree vs Strongly Disagree/ Disagree/Neutral.

Table 20. User Satisfaction (N=86)

	Percent
Do you agree with the following statement?	**Agree/Strongly Agree**
"Mango Languages was easy to use"	95.3
"Mango Languages was helpful in studying Spanish"	88.4
"I enjoyed learning Spanish with Mango Languages"	90.7
"I am satisfied with Mango Languages"	83.7

After two months of study, the overwhelming majority of participants (84% and above) agreed with the positive statements that: Mango Languages was easy to use, it was helpful, they enjoyed learning with Mango Languages, and they were satisfied with it.

Almost all (98.9%) of the respondents in the exit survey declared that they would continue to use Mango Languages after the end of the study.

In the exit survey, a special question was included: "How likely are you to recommend Mango Languages to a colleague or friend?" with 11 possible answers, from 0 "Very unlikely" to 10 "Very likely". The answers to this question were used to compute the so-called Net Promoter Score (NPS). This is "a management tool that can be used to gauge the loyalty of a firm's customer relationships" (Wikipedia). It was developed by Reichheld (2003) and it categorizes users in three categories: "Promoters" (answers 9, 10), "Passives" (answers 7, 8), and "Detractors" (answers 0-6). NPS is equal to the difference between "Promoters" and "Detractors" and in general it can vary from -100 (all detractors) to + 100 (all promoters). As a rule, a positive NPS is good news for the company and the higher the score, the better the indicator for the company.

From our exit survey the "Promoters" were 58.1%, the "Detractors" were 16.3% and "Passives" were 25.6%. The Mango Languages NPS was +41.8.

LIMITATIONS OF THE STUDY

This is the 12th study[35] of the Research Team testing the efficacy and motivation of language learning apps (Vesselinov, Grego, et al., 2009-2019). The statistical design and methodology are practically the same for all 12 studies. The only major deviation is the measurement of study time in the first Rosetta Stone study in 2009. In this study, study time was self-reported instead of automatically recorded by the server because participants were given CDs with the software and no objective measure for study time was technologically available.

The population of adult people who are seeking to study foreign language with language apps is highly educated with the majority of them having at least a college-level education. This is true not only for the U.S.[36], but also Europe[37] and the rest of the world[38]. This was confirmed by all our previous studies[39]. This population has a higher education level than the general population. Our current sample for the 2019 Mango Languages efficacy study is representative of this particular population, but it may not be comparable to the general population.

This study measures the progress of novice/beginner users of Spanish. The study results cannot be generalized for intermediate or advanced users of Spanish.

The independently developed tests used in this study were not tailored to any specific learning tool, including Mango Languages. On the one hand, some participants in the study complained that the test contained words or expressions that were not part of their regular course with Mango Languages. On the other hand, people insisted that they had learned a lot more than the test asked for. The test is valuable as an independent tool for evaluation which allows us to compare efficacy across different apps, however it does not provide a complete measure of the full progress of users. So, the evaluation of their progress in language proficiency is generally conservative.

The Research Team sent e-mail messages every week with individualized information about the study time for the previous week. This seemed to stimulate the study process. The

[35] One study was completed in April of 2019, but the Final Report has not been made public yet.
[36] Rosetta Stone (2009, 2019), Duolingo (2012), italki (2018)
[37] Babbel (Germany & US), Busuu (UK and US).
[38] New Language App, 2015 report, (world sample).
[39] Except Hello English (2017) where the participants were of high school age.

results of the study should be valid in a setting where users study regularly for two months, which may not be the case in typical settings, where users do not receive weekly reminders.

The study results could be generalized for studying Spanish with Mango Languages. For other languages the results could be markedly different.

There are at least two limitations related to comparing the results of this study or those of the eleven previous studies, to a standard college semester of Spanish. First, progress or success in college is determined usually with one midterm exam and one final exam, plus some form of testing for oral proficiency and homework. The progress is measured very differently in a college setting compared to our 12 studies so far. Second, study time in college is difficult to measure scientifically and it is not the same for everybody.

If there is a need to directly compare the progress of language app users and college language learners, a new study can be designed to satisfy the efficacy definition. To the best of our knowledge, such a study has not yet been done, and until then, the two sets of results cannot be compared scientifically. Nevertheless, the WebCAPE is widely and successfully used as a placement test by colleges and universities.

There are a limited number of studies with measures of efficacy available to compare with the results of this study. More help is needed from users, investors, and analysts to require the creators of language learning apps to provide independent efficacy measures. Hopefully in the near future all language apps will be required to present independent efficacy studies to their customers.

Lastly, this study's results may not be generalizable to other contexts: study periods shorter than two-months, languages other than Spanish, or for intermediate or advanced learners of Spanish.

CONCLUSION

The Mango Languages efficacy study is based on a random sample of 95 people, 18 years of age or older, residing in the U.S. All participants were self-reported novice users of Spanish. We applied a set of instruments for written and oral proficiency.

This is one of the first research studies of the efficacy of language learning apps efficacy that uses an incremental instrument to measure improvement in oral proficiency. The use of the TNT gave us the opportunity to detect any change in oral proficiency in both directions: increase and decrease. In our previous studies, we used ACTFL OPIc, which is a level-based test and cannot detect incremental change. Another valuable feature of TNT is that it gives estimates of ACTFL and CEFR levels. The high prices of the commercially available tests with human raters is a big obstacle for research studies.

The main goal of measuring the efficacy of Mango Languages was achieved with this study. Overall 82% of the participants improved their written proficiency during the study. Novice users need on average 15 hours of study in a two-month period to cover the requirements for the first college semester of Spanish.

Overall 77% of all study participants increased their oral proficiency (TNT) during the study. The oral proficiency gain for participants with 8 hours of study or more was as follows: 85% of the participants increased their TNT score, 74% of the participants increased their TNT-ACTFL estimation score, and 72% of the participants increased their TNT-CEFR estimation score;

The written efficacy was an average gain of 18 WebCAPE points per one hour of study and the oral proficiency was a gain of 0.13 TNT points per one hour of study.

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CITED LITERATURE

Agresti, A., Coull, B., 1998, Approximation is better than "exact" for interval estimation of binomial proportions, *American Statistician*, 52, pp. 119–126.

Birdsong, D., Gertken, L., & Amengual, M. Bilingual Language Profile: An Easy-to-Use Instrument to Assess Bilingualism. COERLL, University of Texas at Austin. Web. 20 Jan. 2012. https://sites.la.utexas.edu/bilingual/ .

Dörnyei, Z., 2005. The psychology of the language learners. Mahwah, NJ: Lawrence Erlbaum.

Dörnyei, Z., 2009. The L2 motivational self-system. In Z. Dörnyei, & E. Ushioda (Eds.), Motivation, language identity and the L2 self (pp. 9e42). Bristol, UK: Multilingual Matters.

Kong, J., Han, J., Kim, S., Park, H., Kim, Y., Park, Hy. L2 Motivational Self System, international posture and competitiveness of Korean CTL and LCTL college learners: A structural equation modeling approach, *System*, Volume 72, February 2018, Pages 178-189

Reichheld, F., 2003, "One Number You Need to Grow", *Harvard Business Review*, 2003 December.

Vesselinov, R., Grego, J., Sacco, S., Tasseva-Kurktchieva, M., 2019, The 2019 Rosetta Stone Efficacy Study . http://comparelanguageapps.com/documentation/The2019_RS_FinalReport.pdf

Vesselinov, R. and Grego, J., 2018, italki Efficacy Study. http://blog.italki.com/wp-content/uploads/2017/12/italki2018FinalReport.pdf or http://comparelanguageapps.com/documentation/italki2018FinalReport.pdf

Vesselinov, R. and Grego, J., 2017, Hello English Efficacy Study. http://centralsquarefoundation.org/grant/hello-english-efficacy-study/ , or http://comparelanguageapps.com/documentation/HelloEnglish_2017Study.pdf

Vesselinov, R. and Grego, J., 2016b, The Babbel Efficacy Study. http://comparelanguageapps.com/documentation/Babbel2016study.pdf , or http://press.babbel.com/en/releases/2016-09-29-Spanish-Study.html

Vesselinov, R. and Grego, J., 2016, The Busuu Efficacy Study. http://comparelanguageapps.com/documentation/The_busuu_Study2016.pdf , or https://blog.busuu.com/wp-content/uploads/2016/05/The_busuu_Study2016.pdf

Vesselinov, R. and Grego, J., 2015, Efficacy of New Language App, http://comparelanguageapps.com/documentation/LA_Final_Report.pdf .

Vesselinov, R. and Grego, J., 2012, Duolingo Effectiveness Study. http://comparelanguageapps.com/documentation/DuolingoReport_Final.pdf, or http://static.duolingo.com/s3/DuolingoReport_Final.pdf

Vesselinov, R., Grego, J., Habing, B., Lutz, A., 2009a, Measuring the Attitude and Motivation of Rosetta Stone Users. http://comparelanguageapps.com/documentation/MeasuringTheAttitudeandMotivationofRSUsers.pdf

Vesselinov, R., Grego, J., Habing, B., Lutz, A., 2009b, Comparative Analysis of Motivation of Different Language Learning Software. http://comparelanguageapps.com/documentation/ComparativeMotivationAnalysisofDifferentLanguageSoftware.pdf

Vesselinov, R., 2009, Measuring the Effectiveness of Rosetta Stone. http://comparelanguageapps.com/documentation/MeasuringTheAttitudeandMotivationofRSUsers.pdf, or http://resources.rosettastone.com/CDN/us/pdfs/Measuring_the_Effectiveness_RS-5.pdf.

APPENDIX

Table A1. Study Participants' Geographic Distribution: US States

Number of people

	State	ST	Initial Pool	Eligible Pool	Initial Sample	Final Sample
1	Alabama	AL	1	1	1	1
2	Alaska	AK	1	1	1	1
3	Arizona	AZ	9	9	3	3
4	Arkansas	AR	2		1	1
5	California	CA	60	56	14	9
6	Colorado	CO	13	12	5	5
7	Connecticut	CT	3	3	3	1
8	Delaware	DE	2	1	1	1
9	Florida	FL	30	30	12	6
10	Georgia	GA	16	15	4	1
11	Hawaii	HI	1	1		
12	Idaho	ID				
13	Illinois	IL	17	16	6	5
14	Indiana	IN	2	2	1	1
15	Iowa	IA	2	2	1	
16	Kansas	KS	1	1	1	1
17	Kentucky	KY	3	3	2	1
18	Louisiana	LA	3	2		
19	Maine	ME				
20	Maryland	MD	10	9	4	4
21	Massachusetts	MA	14	14	6	3
22	Michigan	MI	16	16	4	3
23	Minnesota	MN	8	8	1	1
24	Mississippi	MS				
25	Missouri	MO	6	6	2	2
26	Montana	MT				
27	Nebraska	NE	1	1		
28	Nevada	NV	3	3		
29	New Hampshire	NH	2	2	2	2
30	New Jersey	NJ	8	7	3	1
31	New Mexico	NM	2	2		
32	New York	NY	20	20	8	7
33	North Carolina	NC	14	13	6	4
34	North Dakota	ND	2	2	1	
35	Ohio	OH	12	11	7	3

Table A1. Continued

	State	ST	Initial Pool	Eligible Pool	Initial Sample	Final Sample
36	Oklahoma	OK	8	7	1	
37	Oregon	OR	6	5	3	3
38	Pennsylvania	PA	12	11	4	1
39	Rhode Island	RI				
40	South Carolina	SC	2	1		
41	South Dakota	SD				
42	Tennessee	TN	5	5	3	2
43	Texas	TX	47	47	14	9
44	Utah	UT	8	7	1	1
46	Virginia	VA	19	18	8	5
45	Vermont	VT	2	2	1	1
47	Washington	WA	11	10	2	
49	Wisconsin	WI	5	5	3	1
48	West Virginia	WV				
50	Wyoming	WY				
	District of Columbia	DC	8	7	1	
	Unknown state (but US)		29	26	8	5
	Outside US		21			
Total	**All**		**467**	**420**	**149**	**95**

Table A2. Motivation Scale

Developed by Kong et al., 2018.

A. Ideal L2 self (4 items)

1. I can imagine myself living abroad and having a discussion in Spanish.
2. I can imagine myself speaking Spanish with international friends or colleagues.
3. I can imagine myself speaking Spanish as if I were a native speaker of Spanish.
4. Whenever I think of my future career/life, I imagine myself using Spanish.

B. Ought-to L2 self (7 items)

1. I study Spanish because close friends of mine think it is important.
2. Learning Spanish is necessary because people surrounding me expect me to do so.
3. I consider learning Spanish important because the people I respect think that I should do it.
4. Studying Spanish is important to me in order to gain the approval of my peers/teachers/family/boss.
5. It will have a negative impact on my life if I don't' learn Spanish.
6. Studying Spanish is important to me because an educated person is supposed to be able to speak it.
7. Studying Spanish is important to me because other people will respect me more if I have knowledge of it.

C. International posture (6 items)

1. I want to make friends with foreigners visiting U.S.
2. I would feel somewhat uncomfortable if a foreigner moved in next door. (reverse-coded)
3. I want to participate in a volunteer activity to help foreigners living in the surrounding community.
4. I am interested in an international career/living abroad.
5. I often read and watch news about foreign countries.
6. I have thoughts that I want to share with people from other parts of the world.

D. Competitiveness (6 items)

1. I want to survive in the future.
2. I don't want to be an illiterate person.
3. I want to succeed in life.
4. Other people will consider me an elite if I have a good command of Spanish.
5. I don't want to place behind any of my friends.
6. I want to have a head start on other people.

E. L2 learning Experience or Attitudes (4 items)

1. I like the atmosphere of my Spanish classes with Mango Languages.
2. I find learning Spanish with Mango Languages really interesting.
3. I always look forward to Spanish classes with Mango Languages.
4. I really enjoy learning Spanish with Mango Languages.

F. Learners' Intended Effort or Motivated Behavior in L2 Learning (6 items)

1. If Spanish course were offered in the future, I would like to take it.
2. I expend a lot of efforts in learning Spanish.
3. I do my best to learn Spanish.
4. I spend lots of time studying Spanish.
5. I concentrate on studying Spanish more than any other topic.
6. Compared to other people I know, I think I study Spanish relatively hard.

Table A3. Language Profile

Developed by Birdsong et al., 2012.

I. Biographical Information

II. Language history

In this section, we would like you to answer some factual questions about your language history.

1. At what age did you **start learning** English?

   Since birth 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

2. At what age did you **start to feel comfortable** using English?

   As early as I can remember 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+ not yet

3. How many years of **classes (grammar, history, math, etc.)** have you had in English (primary school through university)?

   0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

4. How many years have you spent in a **country/region** where English is spoken?

   0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

5. How many years have you spent in a **family** where English is spoken?

   0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

6. How many years have you spent in a **work environment** where English is spoken?

   0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20+

III. Language use

In this section, we would like you to answer some questions about your language use.

7. In an average week, what percentage of the time do you use English **with friends**?

   0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

8. In an average week, what percentage of the time do you use English **with family**?

   0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

9. In an average week, what percentage of the time do you use English **at school/work**?

   0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

10. When you talk to yourself, how often do you **talk to yourself** in English?

    0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

11. When you count, how often do you **count** in English?

    0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

IV. Language proficiency

In this section, we would like you to rate your language proficiency.

	0=not well at all						*6=very well*
12. How well do you speak **English**?	0	1	2	3	4	5	6
13. How well do you understand **English**?	0	1	2	3	4	5	6
14. How well do you read **English**	0	1	2	3	4	5	6
15. How well do you write **English**?	0	1	2	3	4	5	6

V. Language attitudes

In this section, we would like you to respond to statements about language attitudes.

	0=disagree						*6=agree*
16. I feel like myself when I speak **English**.	0	1	2	3	4	5	6
17. I identify with an **English-speaking** culture.	0	1	2	3	4	5	6
18. It is important to me to use (or eventually use) **English** like a native speaker.	0	1	2	3	4	5	6
19. I want others to think I am a native speaker of **English**.	0	1	2	3	4	5	6

THIS IS THE LAST PAGE

OF THE 2019 MANGO LANGUAGES EFFICACY STUDY

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