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Expectations and Memory: Positive and Negative Expectations of Memorizing the Armenian Alphabet

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Expectations and Memory:
Positive and Negative Expectations of Memorizing the Armenian Alphabet

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Abstract

Studies suggest that expectations may have an effect on various cognitive functions, including memory. To this point, no studies have exclusively investigated the effect of expectations on short-term memory. This study tested the effect of positive and negative expectations on short-term memory, utilizing the Armenian alphabet as a test of memory. N=45 undergraduate students (23 men, 22 women), ranging in age from 18-26 years were divided equally into three groups: Group 1 was a control group, Group 2 was manipulated to have positive expectations before testing, and Group 3 was manipulated to have negative expectations before testing. All groups were given three minutes to study 18 Armenian letters and their English-letter counterparts. Participants were then given two minutes to write the correct English letter next to each Armenian equivalent. A single-factor ANOVA comparing averages between groups showed non-significant results ($p = .15$).

Background

- Research suggests that expectations are strongly linked to performance, with studies showing that perceived expectations of parents is the strongest predictor of academic success, followed by perceived expectations of teachers. Alternately, perceived expectations of peers is the strongest predictor of social behavioral outcomes (Wentzel, Russell, & Baker, 2016).
- Other research suggests that expectations may affect cognitive functioning: expectations mediate the impact of meditation on cognitive processes, with positive expectations associated with higher cognitive functioning (Prätzlich, Kossowsky, Gaab, & Krummenacher, 2016).
- General cognitive control processing may play a causal role in linguistics (Hussey et al., 2016) and individuals with impaired language abilities may have impaired short-term memory (Freed, Lockton, & Adams, 2012), showing a link between language and memory.
- As research suggests that expectations may mediate improve cognitive functioning, our study specifically tested whether there are significant effects of positive and negative expectations on short-term memory.
- The Armenian language is a unique, complex language, with no ties to any of the romantic languages (Godel, 1975). As such, utilizing the Armenian language in memory research would provide a means of testing participants unbiasedly. However, to our knowledge, the Armenian language has not been employed as a means of studying short-term memory and expectations.
- Understanding how expectations affect short-term memory regarding language will provide insight into factors hindering or enhancing language acquisition.

Hypothesis

Do positive and negative expectations affect short term memory?

We hypothesized that participants with positive expectations would correctly identify more letters of the Armenian alphabet that the control group, and that those with negative expectations would correctly identify fewer letters than the control group.
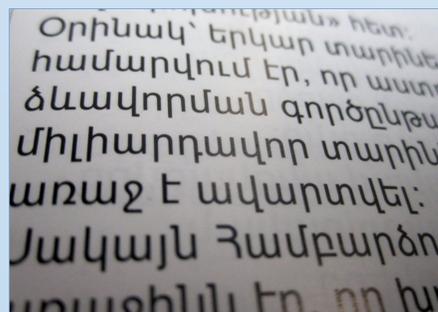
Methods

Participants:
- 45 undergraduate students (23 men, 22 women)
- Ages ranged from 18-26 years (M = 22.02 years, SD ± 0.27 years)
- One participant (2.2% of sample) was Hispanic/Latino, and the remaining 44 participants were Caucasian
- 21 of the participants were recruited from an upper-level psychology course at Brigham Young University (BYU) in Provo, Utah, the remaining 24 participants were volunteers recruited via convenience sampling.
- None of the participants had ever studied the Armenian language or alphabet before

Measures:
- First, Participants were given three minutes to study a paper depicting 18 Armenian letters and their English equivalents
- Then, they were given a sheet showing only the Armenian letters in a different order
- Finally, they were given two minutes to write the English letter equivalent next to each Armenian letter
- Time was measured using a stopwatch (either on a mobile device or wristwatch)
- Tests were given by three different test administrators. One administrator (Examiner 1) was the instructor of the upper-level psychology course. The other two were students (Examiner 2 and Examiner 3) enrolled in the course.
- After collecting the tests, Examiner 2 and Examiner 3 graded each test by hand.

Aa	Աա
Bb	Բբ
Zz	Զզ
Nn	Նն
Kk	Քք
Ss	Սս

This is an example of letters of the Armenian alphabet, with their English equivalents.

Procedure:
- Participants were randomly assigned to one of three groups:
  - **Group 1 (Control):** Participants (8 males, 7 females) studied and took the test as explained above
  - **Variable Groups**
    - Group 2 and Group 3 were each given the following false information regarding the purpose of the test: "The purpose of this study is to measure the difference in short term memory in learning the Armenian alphabet, the Georgian alphabet, and the Greek alphabet. You have been assigned to the Armenian group."
    - **Group 2 (Positive expectations):** The administrator induced positive expectations regarding learning Armenian by reading the following: "We hypothesize that the group learning the Armenian alphabet will remember more letters than the groups learning the Georgian and Greek alphabets. Many studies have shown that the Armenian alphabet is one of the easiest alphabets for English speakers to learn, possibly because of the simplicity of the shapes of the letters and the similarity in structure to the English alphabet. One study showed that participants remembered an average of 85% of the letters after studying the alphabet for three minutes (Hakobyan, 2011)."
    - **Group 3 (Negative expectations):** The administrator induced negative expectations regarding learning Armenian by reading the following: "We hypothesize that the group learning the Armenian alphabet will remember fewer letters than the groups learning the Georgian and Greek alphabets. Many studies have shown that the Armenian alphabet is one of the most difficult alphabets for English speakers to learn, possibly because the individual symbols look very similar to other letters in the alphabet, and are difficult to distinguish. One study showed that participants remembered an average of only 20% of the letters after studying the alphabet for three minutes (Hakobyan, 2011)."

Design and Analysis:
- A single factor ANOVA tested the effects of positive and negative expectations on short-term memory:
  - Independent variables: Positive expectations (Group 2) or negative expectations (Group 3) Dependent Variable: Number of English letters correctly matched with their Armenian letter equivalents (out of 18)
- All data was processed by a Microsoft Excel 2013 data analysis package

Results

Results of Armenian Alphabet Memory Test
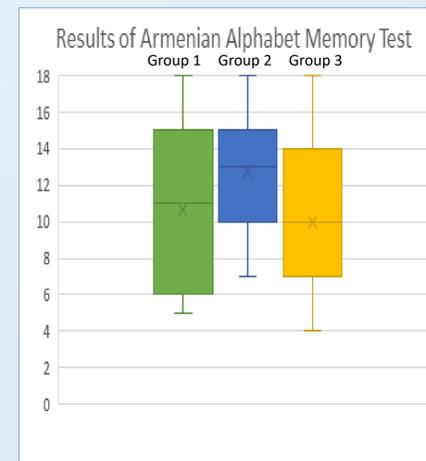
Means and Standard Deviations Study Variables		
Variables	**Mean**	**Standard Deviation**
Group 1 (Control)	10.67	4.59
Group 2 (Positive)	12.73	3.37
Group 3 (Negative)	9.93	3.99
Male	10.82	4.20
Female	11.41	4.08
Examiner 1	13.83	3.66
Examiner 2	11.53	3.42
Examiner 3	10.17	4.38
Students Enrolled in Upper-Level Psychology Course	12.43	3.56
Students Not Enrolled in Upper-Level Psychology Course	9.96	4.27

Note. Group 1, Group 2, and Group 3 show the main findings of the study.

A single-factor ANOVA revealed non-significant results ($p = .15$). On average, Group 2 ($M = 12.73$, $SD = 3.37$) correctly identified slightly more letters than Group 1 ($M = 10.67$, $SD = 4.59$). On average, Group 3 ($M = 9.93$, $SD = 3.99$) correctly identified slightly fewer letters than Group 1. Means and standard deviations were calculated to check for confounding variables, and there were no significant differences between groups. Other variables (see above) were also tested for confounds (see above).

Discussion

- Our hypothesis was that participants with experimentally-induced positive expectations would correctly identify significantly more letters of the Armenian alphabet than the control group, and that those who with experimentally-induced negative expectations would correctly identify fewer letters than the control group
- The results were non-significant, failing to reject the null hypothesis that there is no difference in performance on an Armenian-alphabet task between the control group and groups who were experimentally-manipulated to have positive or negative expectations about their performance on the task

Possible Confounds:
- Most participants in the study were current college students or were college students at one time. College experience may provide increased opportunities to practice activities involving short-term memory. A sample of well-educated participants, practiced in literacy and learning, may moderate the actual effects (Martini & Senechal, 2012).
- Participants expectations before testing may have confounded the results, as their previous experiences may be more correlated with their performance than their present and immediate expectations (Martini & Senechal, 2012). Additionally, 21 of the participants (the students enrolled in the upper-level psychology course) were aware that we were conducting a study that would manipulate a variable, and they may have detected that the passages they read prior to testing were written for the purpose of experimentally-manipulating positive or negative expectations.
- Finally, inter-rater reliability may be a confounding factor in our study. Of the three test administrators, Examiner 1 was the actual instructor of 21 of the participants. Similar to single-informant approaches, this may have led to participants striving to perform better than they normally would (Wentzel, Russell, & Baker, 2016).

Future Implications
- Although our data were not significant, results trended toward significance and the mean scores of each group were in line with our hypotheses. A future study should include a larger sample size to provide enough power to detect an effect
- The uniqueness of the measure is a strength of this study's. To our knowledge, the Armenian language has never been utilized this way, thus, this study provides possibilities for implicating other foreign languages as measures of cognitive functioning, short-term memory, and expectations.
- The trending results suggest a link between expectations regarding a task and the ability to recall information. These results could be useful for those learning a language, studying for school, or performing any task regarding memory.

References available upon request.