

DIFFERENCES BETWEEN CANADIAN AND U.S. BILINGUALS:
SOCIAL STIGMAS AFFECTING COGNITIVE TASK PERFORMANCE

by

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Abstract

Studies conducted in Canada (e.g., Bialystok, Craik, & Ryan, 2006; Bialystok, Craik, & Luk, 2008) have found evidence of a bilingual advantage on cognitive task performance. However, we have yet to replicate these findings in a U.S. sample (e.g., Grant, Dennis, & Li, 2014). There is a difference between Canada and the U.S. with regard to bilingual individuals, specifically in terms of how bilingualism in Canada is perceived to be a marker of elite status, while in the U.S., bilingualism may be an indication of having immigrant status. We suggest that the discrepancies in Canadian and U.S. studies on bilingualism could be attributed to a negative social stigma associated with being bilingual in the U.S. The purpose of the current study was to replicate the findings produced out of Canada in a non-stigmatized bilingual sample in the U.S. by recruiting French-English bilinguals and English-only monolinguals. All participants completed two cognitive tasks (the Simon task, the Stroop task), a language use survey, and a modified Racial Microaggression scale. The results showed that there were no cognitive performance differences in favor of the bilingual speakers however, the results of the Racial Microaggression scale showed that bilingual speakers born in the US feel more stigmatized and targeted than individuals who were not born in the US. Overall, this study was not able to replicate the findings found in the Canadian bilingualism studies because of the existing stigma that is present in the US.

Differences Between Canadian And U.S. Bilinguals:
Social Stigmas Affecting Cognitive Task Performance

Bilingualism is the ability to speak a second language as close as, or to, a native level. There are two different types of bilingualism: simultaneous and sequential. Simultaneous bilingualism occurs when a child is exposed to two different languages consistently and constantly from birth. That child will have equal, or close to equal, exposure to language A and language B throughout their life. Sequential bilingualism occurs when a child is exposed to a second language later than at birth, usually around the same time a child begins formal education, between the ages of four to six years. It must be noted that in the above definitions, bilingualism is separate from second language acquisition, whereby a person is exposed to a second language later in life, after the sensitive period and once their native language's rules and grammar have been encoded as a single set of language rules in one's cognition (Patkowski, 1990). By these definitions, bilingualism is a state of having two languages from birth or a very early age, whereas second language acquisition is when one learns another language later in development. In the United States, there seems to be a difference in bilingualism in terms of performance compared to other countries like Canada (Beauchamp & MacLeod, 2017; Bialystok, Craik & Luk, 2008; Bialystok, 2011; D'Angelo, Hipfner-Boucher & Chen, 2017; Itzhak, Vingron, Baum & Titone 2017; Titone, Libben, Mercier, Whitford & Pivneva, 2011;).

The United States is unique among all developed nations in that our educational system includes second language acquisition in its curricula but does not encourage bilingual education practices in early childhood. This is possibly due to the fact that being bilingual in the U.S. seems inextricably tied to having immigrant status. Anecdotal evidence indicates past generations of immigrants were so concerned about being perceived as immigrants that they taught their children to speak English only in efforts to assimilate into American culture.

Thus, there seems to be a social aspect of bilingualism; being bilingual in the U.S. may include social stigmatization in regard to immigrant population and a social pressure that seems to be established by the nonimmigrant native population of the United States. Given the body of growing research stating that bilingualism confers certain cognitive benefits in young children (Bialystok, 2011) as well as in older adults (Craik, Bialystok, & Freedman, 2010), it has become increasingly important to replicate these findings in the U.S., where Spanish is the second most spoken language with close to 38 million speakers (World Atlas, 2018).

While the body of research on bilingualism and cognition continues to grow, it is important to note that much of the research taking place in North America is conducted in Canada, with French-English bilingual individuals. Other studies of bilingualism take place in European and Asian countries, with very little occurring in the U.S., if any. This is disappointing, as the findings from Canada and elsewhere are quite hopeful: In terms of cognitive functions and performance, multiple studies have found positive effects of bilingualism, most notably in executive control (Bialystok, Craik & Ryan, 2006; Bialystok et al., 2008; Colzato, Bajo, van den Wildenberg, Paolieri, Nieuwenhuis, la Heij & Hommel, 2008; Craik et al., 2010)

Bilingualism and Cognitive Functioning

Bialystok et al. (2006) conducted two studies to measure executive control task performance in young and older bilingual speakers, and young and older monolingual speakers. In the first study, participants were divided into four groups, monolingual young adults, bilingual young adults, older monolingual and older bilingual adults. Participants were screened for second language ability and knowledge. Participants were tested on an antisaccade task (Friesen & Kingstone, 1998). The results showed that there were slight differences in terms of performance between bilingual groups and monolingual groups,

however there was not enough evidence to deduce that bilingual speakers have an advantage in terms of isolating and suppressing inhibitory control and task switching. The second study designed to clarify differences in the performance between the four groups. The methods were the same but the difference in response method was altered. The results showed that both groups, monolinguals and bilinguals, had the same mean reaction times however, there was a performance difference between older and younger participants. Older adults were slower than younger adults, but older bilinguals were slightly faster than older monolinguals. In conclusion the current study suggests that, even in both experiments, with the eye movement and the key press, older bilinguals were able to perform slightly better, implying that bilingualism can be a helpful towards cognitive task, especially executive control.

Colzato et al. (2008) also explored the potential benefits of bilingualism in terms of improving cognitive functions like executive control. This European based study explores the function of inhibitory control by testing bilingual and monolingual participants on stop signal performance, a cognitive task that measures inhibition of a response that has already been initiated, in other words to stop (Ivanoff & Taylor, 2006), the inhibition of return task, a cognitive task that measures how participants respond to a stimuli at different locations on a screen where they previously saw something irrelevant (Klein, 2000), and attentional blink, a cognitive task that measures the phenomenon of the second of two targets cannot be detected or identified when it appears as close in time to the first (Raymond, Shapiro & Arnell, 1992). For the three experiments, participants were separated in two groups : monolingual and bilingual. The monolingual group were native Spanish speakers from Spain and the bilingual group were Dutch-English bilinguals. In the first experiment, the monolingual group had the same reaction time performance as the bilingual group, thus, the researchers didn't find significant evidence that multiple languages are needed to develop active inhibition processes. For the second experiment testing the inhibition of return, the researchers found

that bilingualism affects task performance in inhibitory processes but also, they were not able to find significant differences between active and reactive inhibition. In the third and final experiment, attentional blink was tested. Also, they found statistical differences between the two groups; however, bilinguals showed a bigger blink between the first and second stimulus than the monolingual group. Overall, the study was able to find some similarities with previous conducted research on executive control; however, the current study needed more exploration and was not entirely conclusive on executive control.

This body of research shows that there are cognitive functioning benefits associated with being bilingual. Besides the research looking at benefits regarding cognitive functioning, there is also research that focuses on real-life implications of bilingualism.

Real-life implications of bilingualism.

An important and exciting study conducted by Bialystok, Craik and Freedman (2007) found evidence of a throttling effect of bilingualism on the onset of Alzheimer's-type dementia symptoms. As with their other studies, Bialystok et al. recruited a Canadian sample of monolingual speakers and bilingual individuals diagnosed with dementia. Out of those patients, a little over half (51%) were bilingual. The researchers looked at a series of previous medical records along with the patients' doctors in order to deduce the first appearances of forgetfulness and slow signs of a growing dementia. The researchers were also able to obtain language history files that included the patients' fluency in English, other languages, education and place of birth. Importantly, participants in this study were not solely French-English bilinguals, but English and Polish, Yiddish, German, Romanian and Hungarian speakers. The researchers found that overall, the bilingual speakers experienced the first symptoms of Alzheimer's disease and dementia on average of four years after their monolingual participants. This suggests that bilingualism could potentially be a positive factor that provides benefits in helping patients with Alzheimer's disease.

There is also evidence of benefits of bilingualism in children who have been diagnosed with autism spectrum disorder (ASD; Beauchamp & MacLeod, 2017). This is particularly exciting, as it is commonly suggested to bilingual parents that it is not recommended to raise children with ASD with more than one language in fear of adding more language learning difficulties to a child. Beauchamp and MacLeod explored the research concerning children with language disorders and language learning disabilities, the path of the language development in children with ASD, and the results of raising children with ASD monolingual in a bilingual household context. Overall, they found that bilingualism helped children with ASD and facilitated their social interactions with peers and family members compared to children who speak only one language. In regard to children with ASD, evidence from a large body of research on the topic showed that there were no negative ramifications on the children's language development, and that children with ASD can grow up being bilingual and will have no setback when compared to their monolingual peers. The research explored by Beauchamp and MacLeod suggested that when children are raised monolingual in a bilingual household, it is harder for them to communicate with their parents, resulting in a language barrier between caregiver and child.

Bilingualism in the U.S

Bilingualism has shown to have cognitive function advantage benefits and real-life implication such as benefits in Alzheimer's disease and children with ASD. However, as mentioned earlier, bilingualism research conducted in the United States does not replicate the findings found in Canada or Europe (Grant, Dennis & Li, 2014.) There are some tendencies to believe that speaking a second language is associated with a social stigma that underlines belonging to an immigrant population. This is particularly true when a bilingual individual speaks accented English. There is research that has examined how non-native accented

English is perceived by native English speakers (Hansen & Dovidio, 2016; Gluszek & Dovidio, 2010).

Gluszek and Dovidio (2010) examined participants' non-native accented speech and communication challenges by asking both non-native accented speakers and native-accented speakers to complete a series of questionnaires that assessed their personal experience with language. Participants were also asked about their difficulties in their communications with others and if they experienced problems or difficulty talking with people without an accent. Gluszek and Dovidio found that non-native speakers had a harder time communicating and being comfortable communicating with native speakers, and they had a stronger feeling of not belonging in the United States. Interestingly, Gluszek and Dovidio (2010) also found that when they compared non-native speakers and native regional accented speakers in their feelings of belongingness, they found that, while speakers with regional accents reported some difficulties in communication, they did not report feelings of not belonging; those feelings seemed unique to non-native accented speakers. Thus, the bilingual experience in the U.S. seems to be one of feeling as if one does not belong, and this feeling may be confirmed in the perceptions of others. It is possible that the difference in findings between non-U.S. based and U.S. based bilingualism studies can be explained by this third unique factor that confounds the benefit of bilingualism in the U.S.

Indeed, there are real-world implications of the follow-up study by Hansen and Dovidio in 2016, which explored this topic through hiring recommendations. They had participants listen to a minute-long audio clip about a job interview application. They were randomly assigned to either listen to an audio clip of an Asian accent or a Latino accent. Both clips were identical in terms of content; the only change was the accent. After the audio clip participants were asked on a 1 to 7 Likert scale the desire to hire this individual. Then participants were asked to indicate 'What did the accent they listened to sounded like?' The

results show that there are preexisting biases associated with a lack of understanding towards a non-native speaker of English. The findings of this paper show that there is a bias among accented speakers that leads to discrimination that is even in the workplace even though both people were qualified for this job.

The Current Study

The purpose of the current study was to replicate the findings from the Canadian studies and see if a cognitive advantage provided by bilingualism can be found using a sample from the United States. Previous studies have resulted in failures to replicate, but that could be explained by the use of a stigmatized group for the bilingual sample. Thus, for this study, we recruited a sample from what we believed to be a non-stigmatized group, French-English bilinguals. Despite the choice of using French as a language, we hypothesized that the findings that appear on the Canadian studies will not be able to be replicated using a sample from the U.S. Secondly, the reason as to why these findings cannot be replicated is due to the stigmatization, which was measured using a modified Racial Microaggression scale, associated with speaking a second language in this country, due to labels of belonging to an immigrant group, or more bluntly put, racism.

Methods

Participants

A total of 41 participants were recruited for this study from the SUNY Purchase College Psychology Participant Pool, the membership email list of the French Alliance of Greenwich Connecticut, and by snowball sampling methods through social media posts. Out of the entire sample, 16 did not complete the study in its entirety, thus 16 answers were excluded from the poll, and 25 answers remained. Of those 25 participants, ages ranged from 18 to 74 years ($M = 28.56$, $SD = 18.18$); 15 were bilingual (60%, mean age, $M = 34.66$), and 10 were monolingual (40%, mean age $M = 19.40$), The sample was almost two-thirds female

(64%), and non-Hispanic White/Caucasian (63.6%). With regard to race, of the remaining sample, 9.1% identified as Black/African American, 9.1% identified as Hispanic and 18.2% identified as other (Asian and White & African American). Our primary recruitment efforts focused on only native English monolingual speakers, and French-English bilingual speakers. However, due to the lack of French participants, secondary recruitment efforts expanded our inclusion criteria to include participants who had any other second language knowledge: Hindi (4%), Greek (4%), Cantonese (4%), Spanish (4%) and Portuguese (4%).

Materials

The study was programmed on the platform Psytoolkit.org, a free to use online platform for cognitive psychological experiments. Participants were tested on two cognitive tasks, the Stroop Task and the Simon task. Before each of these tasks, instructions were given to the participants. Following the two cognitive tasks was a general demographic survey asking about age, biological gender, race and ethnicity. Participants then completed a racial microaggression scale that had been modified to test for social stigma associated with participants' social experiences with their language.

The Stroop Task. An online version of the Stroop Color-Naming Task, originally developed by Stroop (1935), was administered through Psytoolkit.org. In this task, participants were presented with colored named stimuli type written in a large font and displayed on the monitor. The stimuli consisted of words representing specific colors: blue, green, red and yellow, that were written in a different font color e.g., the word "blue" written in yellow font. During the task participants pressed the key that corresponded to the font color of the word, not the word itself. For instance, the participant saw a word 'blue', participant had to press the 'R' key which corresponded to the color red of the font. The study performed by Bialystok differs with respect that instead of a key press, participant had to say the color of the font out loud and a microphone recorded the input and stored. Since the

participant were tested were French-English bilinguals, the voice input was discarded in order to control of the tip of the tongue syndrome, especially since some of the color words are similar in French e.g blue - bleu, red- rouge. Furthermore, because of time management issues the key press was a faster and more efficient way to collect data than the voice input.

The Simon Task. The Simon task (Simon & Wolf, 1963) has been used across multiple studies investigating bilingualism and inhibitory control. The stimuli are the words 'LEFT' and 'RIGHT' written in large red and green letters with a black background. In the center of the screen there is a fixation cross. The stimuli appear on either side of the fixation cross. Participants are asked to press the 'Z' key if the stimulus was on the LEFT and press the 'M' key if the stimulus was on the RIGHT. Practice trials preceded experimental trials in order to make certain that the participant understood the instructions. The practice trials displayed their reaction time, whether or not they were correct, and their average. This information was not displayed during the experimental trials. Halfway throughout the experimental trial, the task pauses and instructs the participant to blink their eyes and press the space bar when they are ready to continue. The number of correct responses and the speed of these responses were recorded as the measure of inhibitory control on this task

The Racial Microaggression Scale for Language. The Racial Microaggression Scale (RMAS; Torres-Harding, Andrade, & Romero-Diaz, 2012) is a scale originally developed to identify the presence of disparaging, belittling, or hostile behavior towards individuals belonging to minority groups. The scale utilizes a 25-item questionnaire that targeted micro-assaults, microinsults and microinvalidations. The scale was modified for use in this study in order to measure language stigma and not racial stigma. The questions were picked by looking at the difference types of analyses that each question has (e.g. Invisibility factor, criminality factor, sexualization factor). The measures that the questions were taken from were, the 'Invisibility factor', and the 'Foreigner/Not Belonging factor. The modified

scale was scored according to the instructions provided by Torres-Harding and colleagues, with two scores generated for each factor: a frequency of occurrence score and a distress at the occurrence score. Higher numbers for each score indicate higher levels of frequency and distress.

Results

Participants' scores on each of the four measures were computed by averaging the reaction times for all stimuli presented in the incongruent trials and congruent trials of the Stroop. The remaining two measurements were computed by summing up the correct incongruent trials of the Stroop task and the correct congruent trials. The same thing was done with the scores of the Simon task.

Stroop Task Performance Between Monolingual and Bilingual Groups

Two independent samples t-tests were conducted in order to determine if there were differences between the bilingual and monolingual groups in their performance on the Stroop Task. In the congruent trials, the mean number of correct responses for the monolingual group was 26 ($SD = 7.78$), and for the bilingual group was 20.6 ($SD = 7.03$), (see tables 1 and 2 below). The result of the independent samples t-test comparing the groups revealed no statistically significant difference between the two groups $t(23) = 1.80, p = 0.085, d = 0.74, 95\% CI [0.8, 11.6]$.

With regard to the incongruent trials, the mean number of correct responses for the monolingual group was 10.3 ($SD = 2.66$), and for the bilingual group was 9.26 ($SD = 4.77$). The result of the independent samples t-test revealed no statistically significant differences between the two groups $t(23) = 0.62, p = 0.541, d = 0.25, 95\% CI [2.413, 4.48]$.

Two more independent sample t-tests were conducted in order to determine if there were differences in reaction times between the bilingual group and the monolingual group. In the congruent trials, the mean reaction time (in ms) for the monolingual group was 924.4

($SD = 223.18$), and for the bilingual group was 1136.98 ($SD = 333.77$). The results of the independent samples t-test revealed no statistically significant difference in reaction times between the monolingual group and the bilingual group, $t(23) = 1.76$, $p = 0.092$, $d = 0.72$, 95% CI [-462.36, 37.194].

In the incongruent trials, the mean reaction time (in ms) for the monolingual group was 846.83 ($SD = 233.47$), and the bilingual group was 1001.85 ($SD = 339.55$). The results of the independent samples t-test revealed no statistically significant difference in reaction times between groups, $t(23) = 1.26$, $p = 0.222$, $d = 0.51$, 95% CI [-410.450, 100.450].

Simon Task Performance Comparisons Between Monolingual and Bilingual Groups

Four independent sample t-tests were conducted in order to determine if there were differences between the bilingual and the monolingual group in their performance on the Simon task. In the congruent trials, the mean number of correct responses for the monolingual group was 10.8 ($SD = 2.53$) and for the bilingual group was 10.26 ($SD = 1.28$). The results of an independent samples t-test comparing the groups revealed no statistically significant difference between the two groups, $t(23) = 0.698$, $p = 0.492$, $d = 1.086$, 95% CI [-0.522, 1.086]. When looking at the incongruent trials, the mean number of correct responses for the monolingual group was 8.3 ($SD = 2.49$) and for the bilingual group was 7.93 ($SD = 2.57$). The results of the independent samples t-test revealed no statistically significant differences between the two groups when comparing the incongruent correct trials of the Simon task, $t(23) = 0.353$, $p = 0.727$, $d = 1.44$, 95% CI [-0.65, 0.94].

Two more independent sample t-tests were conducted in order to determine if there were differences in reaction times between the monolingual group and the bilingual group. In the congruent trials, the mean estimate reaction time trial (in ms) for the monolingual group was 603.66 ($SD = 224.35$) and for the bilingual group was 1136.98 ($SD = 333.77$). The results of an independent samples t-test revealed no statistically significant difference in

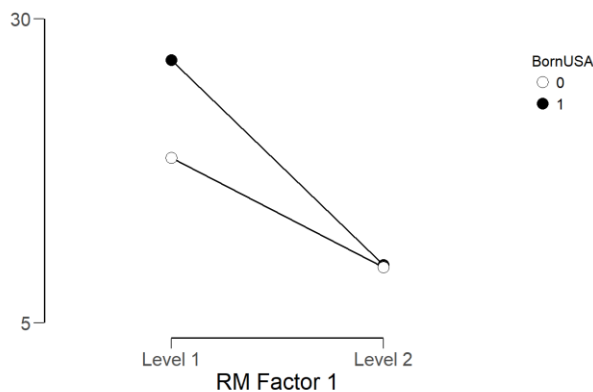
reaction times between the monolingual participants and the bilingual participants, $t(23) = 0.074$, $p = 0.942$, $d = 0.030$, 95% CI [-0.830, 0.771].

In the incongruent trials, the mean reaction times (in ms) trial for the monolingual group was 584.27 ($SD = 221.13$) and the bilingual group was 605.12 ($SD = 330.08$). The results of an independent samples t-test revealed no statistically significant difference in reaction times between the monolingual group and the bilingual group, $t(23) = 0.175$, $p = 0.863$, $d = 0.071$, 95% CI [-0.871, 0.730].

Exploratory Analyses

In addition to these analysis, the results from the Simon task and the Stroop were analyzed using a variable that grouped the participants who were born in the United States ($N = 13$, $M = 16.96$, $SD = 9.26$), and the ones who were not, ($N = 12$, $M = 21.83$, $SD = 10.79$). A between-within subjects ANOVA was conducted with the number of correct items in the congruent and incongruent trials on the Stroop Task entered as the within-subjects variable and whether participants were born in the U.S. (yes, no) as the between-subjects variable. The results revealed a significant main effect of trial type, with all participants scoring higher on the congruent trials ($M = 22.76$, $SD = 7.68$) than on the incongruent trials ($M = 9.68$, $SD = 4.03$), $M_{diff} = 13.08$, $t = 6.95$, $p < .001$. Importantly, there was a significant interaction between trial type and birth country, where participants who were born in the U.S. scoring higher in the congruent Stroop trials ($M = 26.62$, $SD = 5.24$) than participants who were born outside of the U.S. ($M = 18.58$, $SD = 7.88$), $F(1, 23) = 5.08$, $p = .034$. The interaction is illustrated in Figure 1.

Figure 1. Stroop Task Number Correct by U.S. Born vs. Non-U.S. Born status



For the correct congruent trials of the Stroop task the mean for the participants born in the US was 26.61 ($SD = 5.23$), and for those who were not born in the US was 18.58 ($SD = 7.87$). The results of an independent sample t-test revealed a statistical significance between the Stroop correct congruent trials and being born in the US, $t(23) = 3.025$, $p = 0.006$, $d = 1.21$, 95% CI [-2.058, -0.342]. The remainder of the t-tests showed no statistical significance.

Another series of t-tests were conducted to test for significance between the results of the Simon task and the variable 'Born in the US'. The results of the t-tests showed no statistical significance between the results of the Simon task and the variable 'Born in the US', means and standard deviations for all groups are presented in Tables 3 and 4 below.

Finally, one last analysis was conducted among the bilingual participants, to determine if there was a difference in the Racial Microaggression Scale scores between participants who were Born in the U.S. and those who were not born in the U.S.'. The questions of the RMA scale were grouped in two categories: 'Foreigner/Not belonging' and 'Sexualization'.

For the Foreigner/Not belonging score, the mean among the participants who were born in the US was 2.46 ($SD = 0.592$) and for the participants who were not born in the US was 1.22 ($SD = 0.38$). The results of an independent sample t-test revealed that there was a statistical difference between participants who were born in the US and those who were not

on the Foreigner/Not belonging questionnaire, $t(11) = 3.375$, $p = 0.006$, $d = 2.221$, 95% CI [0.606, 3.771]. Another series of t-tests were conducted to determine if there were any differences between the scores on the Foreigner/Not belonging category, the degree of distress score, the 'Sexualization' score and the 'Sexualization' degree of distress score. The results of the t-tests showed no significant differences between the participants who were born in the US and those who weren't and the scores of the Foreigner/Not belonging category, the degree of distress score, the 'Sexualization' score and the 'Sexualization' degree of distress score, the means for each category are displayed on the Graph 1.

Discussion

Previous research has shown that bilingualism has cognitive benefits over monolingual speakers (Bialystok et al. 2007). The current study was yet another failed attempt at replicating the findings found in the Canadian studies (Grant et.al 2014). The goal of this research paper was to show that even with a non-stigmatized language like French, there would be no statistical differences between cognitive performances amongst the monolingual participants and the bilingual participants. Also, this outcome was predicted due to the underlined stigmatization of speaking a foreign language in the United States as seen in the article by Grant and colleagues (2014), which is regarded and viewed as belonging to immigrant populations (Gluszek et al. 2010).

The first analysis grouped the results of the Stroop and the Simon task with the variable 'Bilingual' which indicated if the participants were bilingual or not. The t-tests showed no significant difference. However, when looking at the statistical means, one was able to tell that the bilingual participants and the monolingual participants had approximately the same performance. This shows that regardless of the bilingual advantage held by some participants, there were no differences in performance. For the Simon task, the same results were found. There were no statistical differences between the two groups.

In the second analysis, the results from both cognitive tasks were compared to the variable 'born in the US', which groups the participants who were and were not born in the US. The results of the Simon task showed no statistical differences when comparing it to the 'Born in the US' variable. For the Stroop task however, there was statistical difference between the correct congruent trials and the variable 'Born in the US'. When the word matched the color, participants who were born in the United States had better performance than those who were not. This was the only interaction that showed a significance. A potential explanation for this finding may be because being born in the US and being native in English gives an advantage compared to the people who weren't in regard to that specific task. Since snowball sampling was mainly used to collect data, the primary researchers obtained data from participants from France, Greece, Belgium and Puerto Rico. Besides Puerto Rico, in the other countries, English is not a first language. In counterpart, this statistical difference was not found with the Stroop incongruent correct trials. When looking at the means of the two groups they were almost identical. This observation led the primary researchers to assume that this interaction could have occurred due to chance alone and not a relationship between the two variables.

The third analysis that was computed looked at the score results from the Racial microaggression questionnaire and the variable 'Born in the US'. The questionnaire was grouped into two groups, Foreigner/Not belonging and Sexualization. The t-test showed a significant interaction between the Foreigner/Not belonging group and the variable 'Born in the US'. This interaction refers back to the second hypothesis for this study, and the impact of social stigma on a second language. It demonstrates that even for people who are born in the United States and whose native language is English and speak another language at home, they 'feel' as though they are not belonging and 'perceived' as foreigners. This finding shows there is an existing stigma associated with language in general in the United States and not

only 'stigmatized' languages that are associated with belonging to an immigrant population like Spanish and Chinese (Lindemann, 2005).

The final analysis was computed using a between-within subjects ANOVA, that looked at the correct items from the incongruent and congruent trials, and the variable 'Born in the U.S' (yes or no). The results reveal a statistical significant interaction between the two variables.

The study had for goal to replicate as close as possible the Canadian studies by Bialystok.

There were a few limitations in this study. Since snowball sampling was used to collect participants for this study, bilingual participants who were not French also participated in the study, some of whom were not from the United States. Something that may have affected the results the most was that there were not enough French-English bilinguals recruited for this study. Out of the 15 bilingual participants, only 6 were French-English bilinguals. There is the possibility that the rest of the bilingual participants skewed the results and the bilingual benefits found in Canada were not found with this sample.

Conclusion

The findings from Bialystok's studies on bilingualism were not replicated using this sample. The results that were obtained were the ones that were hypothesized, that there would be no differences in performances between the bilingual group and the monolingual group. This is due to the fact that there is an underlined social stigma related to speaking a second language in the United States, that was demonstrated by the second hypothesis. It is a pity that a country as global as the United States has made such a bad experience for people who speak a second language.

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Table 1. Descriptive Statistics Stroop and Simon Reaction Time Trials.**Variable 'Bilingual or Monolingual'**

| Trial Type | Group | <i>N</i> | <i>M</i> | <i>SD</i> | <i>SE</i> |
|---|-------------|----------|----------|-----------|-----------|
| Stroop Congruent Reaction Time Trials | Bilingual | 15 | 1136.987 | 333.771 | 86.179 |
| | Monolingual | 10 | 924.4 | 224.182 | 70.893 |
| Stroop Incongruent Reaction Time Trials | Bilingual | 15 | 1001.853 | 339.551 | 87.672 |
| | Monolingual | 10 | 846.83 | 233.471 | 73.83 |
| Simon Congruent Reaction Time Trials | Bilingual | 15 | 610.093 | 207.635 | 53.611 |
| | Monolingual | 10 | 603.66 | 224.235 | 70.909 |
| Simon Incongruent Reaction Time Trials | Bilingual | 15 | 605.127 | 330.083 | 85.227 |
| | Monolingual | 10 | 584.27 | 221.139 | 69.93 |

Table 2. Descriptive Statistics Stroop and Simon Task Correct Items on**Congruent and Incongruent Trials Trials****Variable 'Bilingual or Monolingual'**

| Trial Type | Group | <i>N</i> | <i>M</i> | <i>SD</i> | <i>SE</i> |
|-----------------------------------|-------------|----------|----------|-----------|-----------|
| Stroop Congruent Correct trials | Bilingual | 15 | 20.6 | 7.039 | 1.817 |
| | Monolingual | 10 | 26 | 7.789 | 2.463 |
| Stroop Incongruent Correct trials | Bilingual | 15 | 9.267 | 4.773 | 1.232 |
| | Monolingual | 10 | 10.3 | 2.669 | 0.844 |
| Simon Congruent Correct trials | Bilingual | 15 | 10.267 | 1.28 | 0.33 |
| | Monolingual | 10 | 10.8 | 2.53 | 0.8 |
| Simon Incongruent Correct trials | Bilingual | 15 | 7.933 | 2.576 | 0.655 |
| | Monolingual | 10 | 8.3 | 2.497 | 0.79 |

Table 3. Descriptive Statistics Stroop and Simon Task Correct Items on Congruent and Incongruent Trials.

Variable 'Born in the U.S'

| Trial Type | Group | <i>N</i> | <i>M</i> | <i>SD</i> | <i>SE</i> |
|-----------------------------------|---------------------|----------|----------|-----------|-----------|
| Stroop Congruent Correct Trials | Born in the U.S | 13 | 26.615 | 5.237 | 1.425 |
| | Born outside the US | 12 | 18.583 | 7.879 | 2.275 |
| Stroop Incongruent Correct Trials | Born in the U.S | 13 | 9.769 | 2.421 | 0.671 |
| | Born outside the US | 12 | 9.583 | 5.384 | 1.554 |
| Simon Congruent Correct Trials | Born in the U.S | 13 | 10.538 | 2.332 | 0.647 |
| | Born outside the US | 12 | 10.417 | 1.24 | 0.358 |
| Simon Incongruent Correct Trials | Born in the U.S | 13 | 8.846 | 2.41 | 0.668 |
| | Born outside the US | 12 | 7.25 | 2.417 | 0.698 |

Table 4. Descriptive Statistics Stroop and Simon Tasks Reaction Time Trials

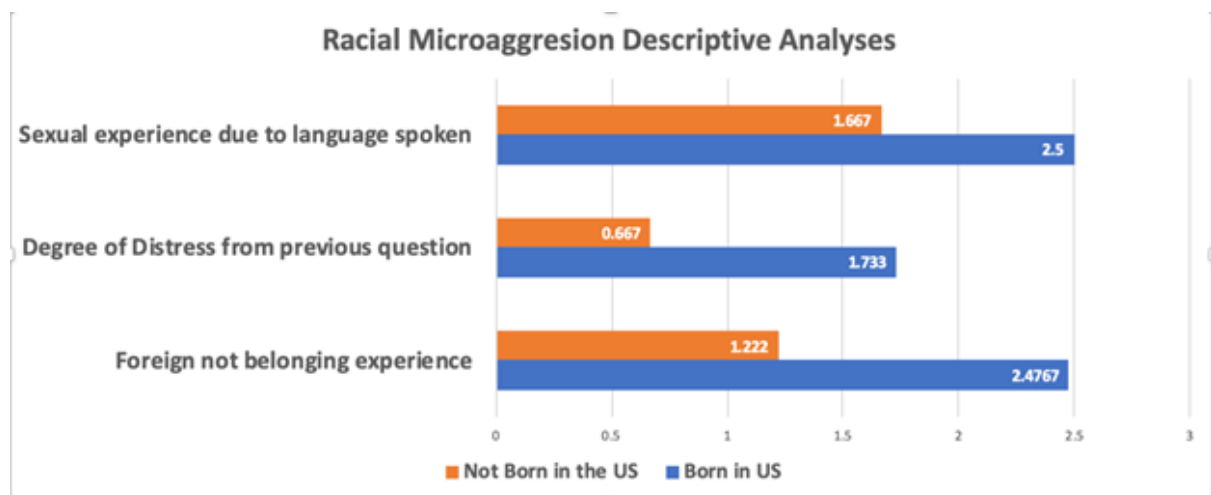
Variable 'Born in the U.S'

| Trial Type | Group | <i>N</i> | <i>M</i> | <i>SD</i> | <i>SE</i> |
|---|---------------------|----------|----------|-----------|-----------|
| Stroop Congruent Reaction Time Trials | Born in the U.S | 13 | 972.738 | 208.638 | 57.866 |
| | Born outside the US | 12 | 1137.767 | 380.29 | 109.78 |
| Stroop Incongruent Reaction Time Trials | Born in the U.S | 13 | 879.923 | 212.815 | 59.024 |
| | Born outside the US | 12 | 1004.758 | 382.358 | 110.337 |
| Simon Congruent Reaction Time Trials | Born in the U.S | 13 | 610.985 | 213.109 | 59.106 |
| | Born outside the US | 12 | 603.767 | 215.542 | 62.222 |
| Simon Incongruent Reaction Time Trials | Born in the U.S | 13 | 582.769 | 196.809 | 54.585 |
| | Born outside the US | 12 | 611.967 | 369.025 | 106.528 |

Graph 1.

Racial Microaggression Descriptive Analyses.

Variable 'Born in the US'.



Appendix A

Informed Consent Form

Name of Study: Bilingualism in the United States: A replication.

Researchers: Alexandros S. Baida, Kaori Kubo Germano, Ph.D

Contacts: alexandros.baida@purchase.edu, kaori.germano@purchase.edu

Purpose: We would like permission to enroll you as a participant in a research study. This study investigates the effects of bilingualism on cognition and brain functioning.

Procedure: In this experiment, you will be asked to take two (2) different computer-based tasks. There will be detail explanations of how you should go about performing each task. The participants will be completing the computer-based cognitive tasks prior to taking a basic demographic survey. The demographic survey will also include language assessments questions. Monolingual participants that indicating that they have no knowledge of another language will be directed to the end of the survey where they will receive instructions on how to get participation credit. The experiment should not take more than 30 minutes to complete. There are going to be pauses in between each test, so that you don't do it all in one go.

Costs, risks, and discomforts: There is minimal risk to participants in this study. You may experience some fatigue or tiredness but nothing more than a long computer session.

Benefits and compensation: The general benefit of participating in scientific research is the satisfaction that comes from contributing to science and the pursuit of knowledge. For your participation you will be rewarded with one credit hour, or a prorated rate of \$10 per hour.

Confidentiality: The results of this study may be published in a scholarly book or journal or used for teaching purposes. However, your name and other identifiers will not be used in any publication or teaching materials. Your data will never be associated with your name or any other information that would make it possible to identify you.

Refusal or withdrawal of participation: You do not have to participate in this study. If you decide to participate, you can change your mind and drop out of the study at any time without affecting your present or future interactions with the experimenters and with no loss of credit for participation.

Signature: I confirm that the purpose of the research, the study procedures, the possible risks and discomforts, as well as potential benefits that I may experience have been explained to me. All my questions have been answered. I have read this consent form. My electronic consent indicates my willingness to participate in this study. I understand that I may contact the chair of the Institutional Review Board if I experience any problems during this experiment or have concerns about the ethics of this research [irb.chair@purchase.edu].

- By checking the this box, I confirm that I am 18 years old or older. I have read this consent form and I am willing to participate in this study.

Appendix B:
Demographic Questionnaire.

- What is your age? Please indicate below
- What is your biological sex? Male, Female, Other (please specify)
- What gender do you identify with? Male, Female, Other (please specify)

- How do identify yourself ethnically/racially? (please select one of the following):
 - Hispanic
 - Non hispanic White/Caucasian
 - Black/African American
 - Asian
 - Native Hawaiian/ Pacific Islander
 - American Indian/Alaskan Native
 - Other (please specify):

- What is your country of origin? Please indicate below
- What is your country of residence? Please indicate below

- We are interested in your language abilities Do you speak more than one language? Yes or No.
- What is your native language?
- Was your native language spoken at home during childhood? Yes or No
- What language was spoken at home during your childhood?
- How often did you use your native language now?
 - daily, only at home, only with friends/ peers, only when I have to/ very rarely.

- Please tell us a little bit about your second language.
- What is your second language?
- At what age did you start learning this language?
- How did you learn this language (e.g. at home at, at school, on my own).
- How many years have you been speaking this language?
- How often do you use your second language now?

daily/ only at home/ only with friends/peers/ only when I have to/ very rarely.

-What language do you prefer to speak?

-What language do you prefer to write?

-What language do you feel more comfortable using?

Appendix C :**Racial Microaggression Scale****Modified to ask for stigma associated with language.**

1. Because of my language, other people assume that I am a foreigner.
A. How often does this happen to you? (0 to 3 scale) B. If this does happen to you how stressful, upsetting or bothersome is this for you? (0 to 3 scale).
2. Because of my language, people suggest that I am not a 'true' American.
A. How often does this happen to you? (0 to 3 scale) B. If this does happen to you how stressful, upsetting or bothersome is this for you? (0 to 3 scale).
3. Because of my language, other people often ask me where I am from, suggesting that I don't belong here.
A. How often does this happen to you? (0 to 3 scale) B. If this does happen to you how stressful, upsetting or bothersome is this for you? (0 to 3 scale).
4. People suggest that I am 'exotic' in a sexual way because of the language that I speak.
A. How often does this happen to you? (0 to 3 scale) B. If this does happen to you how stressful, upsetting or bothersome is this for you? (0 to 3 scale).

Appendix D:
Inquiry email to the Alliance Française of Greenwich

To whom it may concern,

My name is Alexandros Baida and I am senior psychology student at SUNY Purchase College of New York. My senior project sponsor, Dr. Kaori Kubo Germano, and I are conducting a psychology research experiment in English-French and French-English bilinguals. I spoke with Dr. Anne Kern, the dean of our school, and she mentioned your association may be of help. We were wondering if we could send out an email to your members with a link to the survey in order to recruit participants for the study. We are looking for a population of young adults, 18 and older, that are native in French and English is their second language or English native speaker with a French background. Participants to the study will receive monetary compensation of a prorated rate of \$10 per hour for their time. If you have any questions please don't hesitate to contact my sponsor: kaori.germano@purchase.edu or myself.

Thank you for your consideration,

Alexandros S. Baida.

Appendix E:
Debriefing Statement

This goal of this study was to explore the differences in bilingualism in the United States by looking at French-English and English-French bilinguals. Most of the research regarding this topic has been conducted in Canada. In our lab, the research on bilingualism so far has only been theoretical and correlational and not experimental. With this study, we are hoping to find out one of the reasons why bilingualism is not as prominent and accepted in the United States like it is in Canada and Europe.

The tasks that you had to complete are called the Stroop task (with the color words) and the Simon task (with the direction LEFT and RIGHT). These are cognitive task that measure how fast you are to respond to the correct answer. On average, when comparing people who speak only one language and people who speak more than two, the individuals who speak more than one language perform better at this task. The hypothesis for this study was that regardless the evidence provided by previous studies that bilingual individuals have a advantage over those tasks, we predict that the results will not show that effect, in order to reveal a potential cause as to why bilingualism is not praised and acknowledge in the American culture because of social stigmas due to immigrant backgrounds and racism.

If you have any question regarding the results of the study and you would like to receive a report once the study has been completed, please reach out to my project sponsor, Kaori Kubo Germano, Ph.D : kaori.germano@purchase.edu and the primary investigator, Alexandros S. Baida: alexandros.baida@purchase.edu.

If you have any concerns regarding the ethics of this research please contact the chair of the IRB by emailing irb.chair@purchase.edu

Thank you for taking time and participating in our research study.