

A Study of Lexical Distance between Languages and Emotional Regulation

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Abstract: Although being able to speak more than one language has been shown to positively impact multilingual's ability to regulate emotions in times of stress, anger, anxiety, fear etc. through different strategies such as the reappraisal of situations and suppression of emotions, little research has been done on whether lexical distance (LD), the measurement of similarities and differences between two languages, influences emotional regulation. In this paper, I explored the link between lexical distance and emotional regulation (across its two facets of reappraisal and suppression) by conducting a survey in which participants (liberal arts college students ages 18-24) were provided with reliable measures for each variable in counterbalanced blocks based on the languages they spoke. There was no significant difference between monolingual and multilingual speakers across either of the two Emotional Regulation facets nor was there a significant difference between the difference of English and Second Language scores as a function of lexical distance. However, lexical distance did influence reappraisal scores more significantly than suppression scores indicating that language may play a role in reappraising emotions, but suppression is a more innate process. Thus, overall, the impact of lexical distance may be overshadowed due to the complexity of multilingualism and personality trait differences across individuals.

Language is a critical aspect of human communication that shapes our cultures, identities, and emotional experiences. From the moment we are born, we are immersed in a linguistic environment that shapes how we understand and interact with the world around us. The language(s) we speak influences our perception of emotions, our ability to communicate with others, and our cultural beliefs and practices. However, the role the structure of a language plays in our emotional development and regulation has historically, often, been overshadowed.

The extent of the relationship between language and emotion has typically been limited to the acceptance that the things people say affect our emotions but also that we describe our emotions or the emotions we see in others with words. However, growing scientific research and consensus indicates that language plays a much deeper and nuanced role in the development and regulation of our emotions than previously thought (Pavlenko, 2006).

Studying the ways in which language is beneficial to the development and self-perception of our emotions is especially important and beneficial in an increasingly interconnected global society in which languages and cultures are constantly intermingling and evolving. Furthermore, languages are different from each other to varying degrees and the differences in emotion categories and structures within a language may equip people with a larger metaphorical toolbox to handle and regulate emotions. There is very little published research about whether emotional regulation is not only influenced by the number of languages a person speaks but also the structure of the language as well.

BACKGROUND

Emotional regulation is defined as the process of managing and controlling one's emotional responses to different situations and stimuli which involves the ability to identify, understand, and modify emotions in a way that enhances well-being and meets personal and social goals (Gross, J.J., 1998). Emotional regulation can involve a variety of strategies, such as re-appraising a situation, suppression, distraction, and rumination. This helps to reduce emotional distress and to help individuals effectively navigate their environment, maintain stable relationships, and pursue their goals and aspirations. Emotional regulation is thought to develop over the course of childhood and adolescence. During this time, individuals gradually learn how to recognize and understand their own emotions and those of others, and how to regulate their emotional responses. The development of emotional regulation is influenced by a number of factors, including genetics, early childhood experiences, family relationships, and exposure to various stressors and adverse events (Calkins, 1994; Hariri & Holmes, 2006). Additionally, the development of emotional regulation is thought to involve a number of different brain regions, including the amygdala, prefrontal cortex, and insula. These regions work together to process emotional information, generate appropriate emotional responses, and help individuals modulate their emotional reactions to different situations (Park et al., 2019).

There is scientific consensus that the skills for managing emotions allow children, adolescents and adults to inhibit inappropriate impulses, to direct their behavior constructively, to explore and adapt to new environments, people and objects, and to be better accepted by their peers (Sabatier et al., 2017; Eisenberg et al., 2001). The inability to adequately regulate emotions has been found to be related to a number of psychological disorders (Bender et al., 2012; Cole et al., 2009). More specifically, emotional regulation can manifest in two ways: cognitive reappraisal and expressive suppression. Cognitive reappraisal involves changing the way one thinks about a situation in order to alter the emotional response (Gross & John, 2003). For example, if a person is nervous about a job interview, they might use cognitive reappraisal to think about the situation as an opportunity to showcase their skills and expertise rather than focusing on their nerves. Expressive suppression, on the other hand, involves inhibiting the outward expression of emotions (Gross, 1998). For example, if a person is angry, they might try to hide or suppress their anger rather than expressing it outwardly.

The self-perceived use of reappraisal and expressive suppression have distinct affective, cognitive, and social consequences:

1. Affective consequences: reappraisal is linked to subjective well-being (Ortner, Briner, & Marjanovic, 2017), lower depression and lower trait anxiety, while expressive suppression is linked to lower well-being and greater negative emotions, feelings of inauthenticity and depression (Gross & John, 2003; Aldao, Nolen-Hoeksema, & Schweizer, 2010);
2. Cognitive consequences: frequent “suppressors” have poorer self-reported and objective memory than those who suppress less frequently, while “reappraisers” have comparable or enhanced memory than “non-reappraisers” (Richards & Gross, 2000);
3. Social consequences: the habitual use of suppression is correlated with lower levels of social connection (social support and closeness), while reappraisal is positively linked to peer-rated social connection, both using cross-sectional (Gross & John, 2003) and longitudinal databases (English, Gross, John, & Srivastava, 2012).

Hence, given the importance of emotional regulation, it is a worthwhile endeavor to explore how emotional

regulation of an individual might be impacted by the inherent structure of the languages the person speaks. Language and Emotion

Language has the ability to influence the extent to which we can regulate our emotions. Research has showcased the link between language competence and emotional intelligence in developing children (Beck et al., 2012). Emotional intelligence is a set of abilities that people have to understand and manage emotions, whereas emotion regulation is a set of behaviors that people do to manage and regulate their emotion (Salovey & Mayer, 1990). Emotional intelligence and Emotional regulation are, without a doubt, separate psychological constructs. However, they are also undoubtedly related. People with higher emotional intelligence tend to use more effective emotion regulation strategies (Gross, 2015) and hence, research findings about language and emotional intelligence are relevant for the purposes of this paper.

Language competence (LC) can be defined as the ability to use language effectively and appropriately in various social contexts. This includes the ability to understand and produce language at the phonological, lexical, syntactic, and pragmatic levels (Kormos, 2012). Language competence is positively correlated with emotional intelligence and Emotional Competence (EC). Specifically, individuals who tend to score highly on a language competence test are more likely to have higher emotional competence scores (Beck et al., 2012; Monopoli & Kingston, 2012). The Beck et al (2012) paper examined relations between multiple components of LC and EC in a sample of 210 school-age children. Five measures represented LC (receptive vocabulary, verbal fluency, literacy, narrative structure, and narrative use of evaluative devices) while four measures represented EC (expressive emotion vocabulary, declarative emotion knowledge, awareness of mixed emotions, and facial emotion recognition). Results showed strong positive correlations between LC and EC ranging between $r = .12$ and $r = .45$.

Another method of establishing the link between two constructs is by monitoring the change in one construct in the absence of the other. Therein, research shows that individuals with Specific Language Impairment (SLI) have difficulty regulating their emotions as compared to typically developing individuals (Martin et al., 2002). In this study, teachers were asked to rate the emotion regulation behaviors of 41 children with SLI and 41 typical peers using an

"Emotion Regulation Checklist". Children were sampled from two age levels (6–9 years and 10–13 years). At each age level, equal numbers of boys and girls were sampled. As a group, children with SLI received significantly lower ratings than typical children. In addition, girls produced higher scores than boys. None of the other interactions was significant. This suggests that SLI can interfere with the ability to effectively regulate emotions and hence, indicates that the absence of proper language and concept knowledge understanding can impair emotional development and therefore, further cements the idea that language can influence the perception of emotion.

Multilingualism and Emotional Regulation

If language does indeed play a role in the development and regulation of emotions, how then is our emotional regulation impacted after learning multiple languages and why? Different languages can influence the interpretation of emotions in a few ways. Firstly, certain words and expressions in one language may not have an equivalent in another language. This can lead to misunderstandings and confusion when attempting to communicate emotions. Secondly, different languages may have different connotations for certain words. Thirdly, different languages may have different cultural meanings associated with certain expressions. Finally, the way in which certain emotions are expressed in one language may be different from the way they are expressed in another language. For example, Greek does not have a counterpart of 'frustration,'; on the other hand, it does have a feeling of *stenahoria* (discomfort/sadness/suffocation), which is experienced only in Greek-speaking surroundings (Panayiotou, 2004). All of these factors can lead to different interpretations of the same emotion. Hence, we would expect multilinguals to have a more nuanced understanding of their emotions and thereby, better control at regulating them than monolinguals.

The language being used to describe and actively engage with an emotion has an impact on the regulation of said emotion. The Panayiotou (2004) paper examined the impact of language on emotional responses in bilinguals. The sample consisted of 61 bilinguals speaking both English and Greek. The study found that the language used to describe emotions had a significant impact on the emotional responses of bilinguals. Specifically, the study found that when the language used to describe emotions was switched, the emotional responses of the bilinguals changed. It is

important, however, to note that these studies that manipulate and measure the role of different languages in regulating emotions observe that the effects are only observable when the subject is speaking, reading or thinking in the target language. It is not enough to only possess knowledge of another language, but it is essential to be actively engaging with it.

Hence, multilingualism can be used to modify the intensity of emotions, such as by using different languages to shift attention away from negative emotions and towards more positive ones. For example, studies have shown that bilinguals are able to regulate their emotions more effectively than monolinguals, and that multilinguals are able to control their emotions more effectively in times of stress (Pavlenko, 2006). Additionally, research suggests that multilingualism can be used to increase self-control and to reduce the intensity of negative emotions such as anger, fear, and anxiety by enabling people to "take a break" from stressful situations by switching languages, giving individuals a greater sense of control over their thoughts and feelings and also providing people with a better sense of cultural identity which can promote feelings of well-being and help reduce negative emotions. The research also indicates that multilinguals are better able to manage the emotions of others, and that multilingualism can be used to facilitate communication within intimate relationships (Pavlenko, 2006).

On a more neurological level, multilingualism enhances a person's ability to think about their own thought processes and can lead to improved problem-solving and decision-making. Hence, a greater self-awareness of one's own emotions and thoughts results in better emotional regulation outcomes for multilinguals over monolinguals (Bright et al., 2019).

Lexical Distances and Emotional Regulation

If emotional regulation is, in fact, influenced by the ability to speak multiple languages due to differences across languages in the categorization of emotions, connotations, cultural differences and lack of equivalent emotion words, then the question arises whether pairs of similar languages spoken by a multilingual individual have less of an impact on emotional regulation than pairs of drastically different languages due to differing ways of categorizing, connoting and addressing emotions. For instance, it has been argued that because some languages denote differences between emotion categories that others do not, this may promote greater emotion differentiation

and thus, greater emotion regulation, when speakers are thinking in this language (Lindquist et al., 2015).

The measurement of the similarities and differences between one language from another is called lexical distance. It is possible to quantify the lexical distance between languages by using models that consider character-based n-gram. Character n-grams not only encode lexical and morphological information, but also phonological features since written systems are related to the way languages were pronounced in the past (Gamallo et al., 2017). Hence, this method of computing lexical distances provides us with the ability to use and compute a quantifiable number for any language pair and therefore, lends a theoretical framework for comparing the influence of language pairs on emotional regulation.

The psychological constructionist-based model called Conceptual Act Theory (CAT) also suggests that language plays a role in emotion because language supports the conceptual knowledge used to make meaning of sensations from the body and world in a given context. Evidence from developmental and cognitive science reveals that language scaffolds concept knowledge in humans, helping humans to acquire abstract concepts such as emotion categories across their lifespan. This idea is very integral because these findings suggest that language may help bilingual or multilingual individuals implicitly regulate their emotions.

Hence, the idea that differentiation between languages with large lexical distances between them can promote emotional regulation forms the foundation of my studies' hypothesis. Hence, I hypothesize that multilingual participants would have greater emotional regulation scores than monolingual participants. I also hypothesize, based on all of the reviewed evidence and data, a positive correlation between lexical distance and emotional regulation across its two facets of cognitive reappraisal and expressive suppression. Specifically, I hypothesize that the greater the lexical distance between two languages spoken by a multilingual individual, the greater the individual's reappraisal ability, lower the suppression tactics and hence, a greater level of emotional regulation overall.

Thus, this research paper will examine the identified hypothesis through a within subject's design by asking participants to respond to an English emotional regulation questionnaire followed by a translation of the same questionnaire in their indicated second

language, if multilingual. I will then examine possible relationships and correlations between language status, lexical distance of the multilingual participants' second language relative to English, second language proficiency and emotional regulation across its two facets of cognitive reappraisal and expressive suppression.

METHOD

Participants

For our study, the participants were college students at a liberal arts school in the Midwest of the United States. There were 75 participants, and they were recruited through a convenience sample. An additional 25 participants did participate in the present study but were excluded due to their completion of the survey being less than 75% or due to missing data for all of the salient variables. Participants constituted 58.7% Female, 37.3% Male, 4% Non-Binary, 0% other and 0% preferred not to say. 0% of respondents did not input gender data. Furthermore, 56% identified as Caucasian, 9.3% identified as African American, 22.7% identified as Asian, 0% identified as Native American, 6.7% identified as Hispanic or Latinx, 5.3% other and 0% preferred not to say. 0% of respondents did not input demographic data. Participants were not compensated for their participation in the current study and were recruited through social media, email and the college's psychology department participation pool.

Design

The current study had a correlational design with the outcome variable being emotional regulation and the predictor variable being the lexical distance between the languages spoken by the participant. Participants were asked to indicate their second language on the basis of highest proficiency. The lexical distances between the languages in this study were referred to from the Gamallo et al., 2017 paper which includes computed lexical distances for 44 language pairs and also provides a measure for computing lexical distances between any two languages. 8 languages were chosen for this study based on the officially recognized and taught languages at the participant's college; These languages were English, Arabic, Chinese, French, German, Portuguese, Russian, and Spanish. Reliable translations for the emotional regulation measure into these 8 different languages were cited from previous research papers and allocated to the participant based on their indicated second language in order to enable the participant to actively engage with the language. Possible significant

correlations were then examined between the lexical distance of a language pair and the difference between the emotional regulation scores for each language.

MATERIALS

Emotional Regulation. The measure used to quantify emotional regulation, as originally developed and used in Gross & John (2003), uses a 10-item scale designed to measure respondents' tendency to regulate their emotions in two ways: (1) Cognitive Reappraisal and (2) Expressive Suppression. Respondents answer each item on a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). Items 1, 3, 5, 7, 8, 10 make up the Cognitive Reappraisal facet. Items 2, 4, 6, 9 make up the Expressive Suppression facet. Scoring is kept continuous. Each facet's scoring is kept separate. Better emotional regulation was indicated by a higher score on the Reappraisal facet and a lower score on the Suppression facet.

This questionnaire measured the participant's emotional regulation by clearly indicating in each item the emotion regulatory process that were intended to measure, such as "I control my emotions by changing the way I think about the situation I'm in" (reappraisal) and "I control my emotions by not expressing them" (suppression). In addition to these general-emotion items, the Reappraisal scale and the Suppression scale both included at least one item asking about regulating negative emotion (exemplified by sadness and anger) and one item about regulating positive emotion (exemplified by joy and amusement) (Gross & John, 2003). The measure was found to be reliable with a Cronbach's alpha value of 0.80 for the Reappraisal factor and 0.73 for the Suppression factor of the questionnaire (Gross & John, 2003). Refer to Appendix for full questionnaire.

Multiplication Verification Task. Multiplication verification was used as the distractor task. The method was adopted from Byrne and Anderson (1999) who had shown that it is sufficiently engaging to disturb dual-task performance. A speeded response was to be given on whether a presented equation was correct, for example, "Is $8 \times 8 = 64$ True or False?" Half of the equations were correct, half incorrect (Oulasvirta & Saariluoma, 2006). Participants were required to answer each of the 10 multiplication verification questions within five seconds with a two second buffer period. Please refer to the appendix for the full list of questions from this scale.

Procedure

The protocol for delivering these questions was to send out the survey to others online, using either email, social media, or connections to faculty to recruit participants. Participants were asked to read and sign a consent form. Demographic questions were always at the beginning and participants were asked to indicate which additional languages other than English they spoke, if any. Further, if multilingual, participants were asked about their proficiency in their second language along a 4-item scale ranging from "Elementary" up to "Native/Bilingual". Based on the response to the preceding questions, participants were then classified as either monolingual or multilingual. Multilingual participants completed two emotion regulation questionnaires — one in English and one in their additional language — separated by a filler task (multiplication verification task). The order of the two emotion regulation questionnaires was counterbalanced across participants. Monolingual participants were required to only respond to the English version of the questionnaire. The survey was concluded by providing the participants with a debriefing form containing information about the research study. The relationship between language status and the two emotional regulation facets were examined followed by possible significant correlations between the lexical distance of a language pair and the difference between the emotional regulation scores for each language. Due to the study being within-subjects, the possibility of between subject differences can be safely eliminated when computing differences between ER scores. This allows for a test of the hypothesis that the difference between ER scores for language pairs with lower lexical distances will be statistically smaller than the difference between the ER scores for language pairs with large lexical distances.

RESULTS

Before any statistical analyses were conducted, participants who had not completed over 75% of the survey were excluded (25 participants). Reliability analyses were then conducted for the English ERQ Reappraisal Facet ($\alpha = 0.79$), English ERQ Suppression Facet ($\alpha = 0.82$), Spanish ERQ Reappraisal Facet ($\alpha = 0.26$), and Spanish ERQ Suppression Facet ($\alpha = 0.80$). Thereafter, averages for both the reappraisal facet and the suppression facet were computed for all 8 language questionnaires.

A combined average of the reappraisal facet and the suppression facet for all 7 second languages as well as English was also calculated. Participants were then

assigned as either Low Lexical Distance (Spanish, French, Portuguese, and German) or High Lexical Distance (Russian, Chinese and Arabic) based on their indicated second language and its lexical distance relative to English.

I first examined whether multilingual speakers performed better in the reappraisal and suppression facets than monolingual speakers. See Figure 1 and Figure 2. I conducted an independent sample t-test between both the Average Reappraisal Scores and Average Suppression Scores across language status (multilingual vs monolingual).

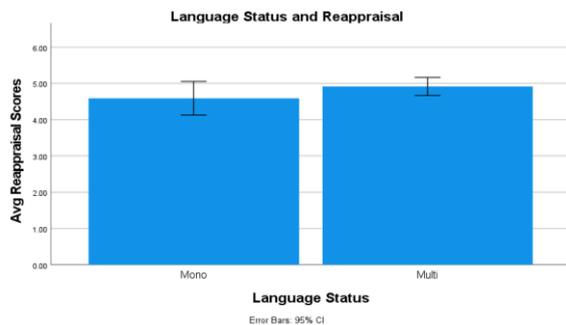


Figure 1 - Average Reappraisal Scores as a function of Language Status

Language status was neither significantly associated with reappraisal scores ($t(73)=-1.131, p=0.131$) nor with suppression scores ($t(73)=-0.243, p=0.404$) indicating that emotional regulation scores were not significantly different for monolingual and multilingual participants.

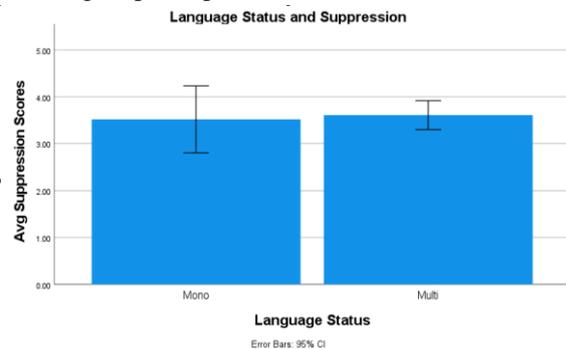


Figure 2 - Average Suppression Scores as a function of Language Status

To examine my main hypothesis of whether lexical distance influences emotional regulation, it was most important to test for an interaction, rather than main effects, between lexical distance and ERQ scores. Hence, to check whether there was a significant difference between the difference of reappraisal and suppression scores for multilingual participant's

English and Second Language ERQ scores as a function of lexical distance, I conducted a within-subjects repeated measures t-test. See Figure 3 and Figure 4.

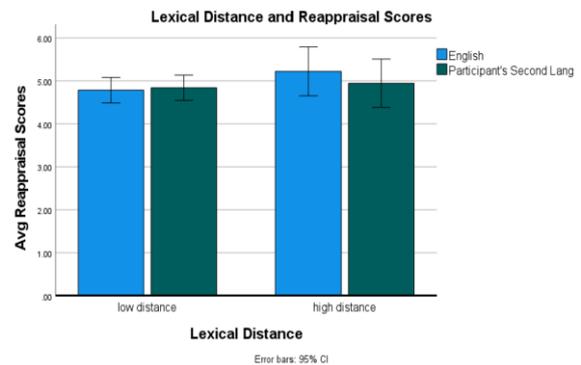


Figure 3 - Average Reappraisal Scores as a function of Lexical Distance

Although there was a greater difference in English and Second Language reappraisal scores for participants in the High Lexical Distance category than in the Low Lexical Distance category, this difference was not statistically significant ($F(1,54)=3.584, p=0.064$) indicating that the lexical distance between the languages spoken by a multilingual participant did affect their reappraisal scores but not to a statistically significant degree. Hence, there was no significant interaction between lexical distance and participants reappraisal scores.

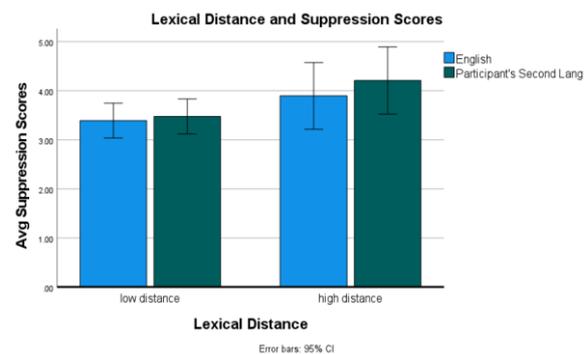


Figure 4 - Average Suppression Scores as a function of Lexical Distance

The difference between the English and Second Language suppression scores for the participants in the High Lexical Distance category was not statistically greater or lesser than the participants in the Low Lexical Distance Category ($F(1,54)=0.835, p=0.365$) indicating that the lexical distance between the languages spoken by a multilingual participant did not significantly affect their suppression scores. Hence, there was no significant interaction between lexical distance and participants suppression scores either.

I also wanted to examine whether lexical distance had more of an interaction with the cognitive reappraisal facet scores than the expressive suppression facet. To do this, I ran a Mixed ANOVA test which checked to see whether the difference in reappraisal scores among high LD vs. low LD participants is different from the difference in suppression scores among high LD vs. low LD participants. Refer to Figure 5.

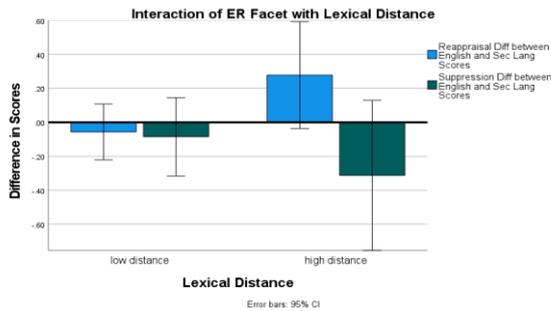


Figure 5- Interaction of ER Type with Lexical Distance

The results were statistically significant ($F(1,54)=4.052, p=0.04$) indicating that lexical distance played a more significant role in participants' responses to items from the reappraisal facet than to the suppression facet. Hence, lexical distance had significantly more of an interaction with the reappraisal facet than the suppression facet.

Further, I wanted to examine whether there was a correlation between a participant's second language proficiency level and their reappraisal and suppression scores. Hence, I checked to see if the scores for both facets positively changed with a greater level of proficiency in the participants' second language. See Table 1.

		Proficiency		
Spearman's rho		Proficiency	SecLang_Reap	SecLang_Sup
Proficiency	Correlation Coefficient	1.000	.239	-.129
	Sig. (2-tailed)		.077	.342
	N	71	56	56
SecLang_Reap	Correlation Coefficient	.239	1.000	.173
	Sig. (2-tailed)	.077		.203
	N	56	56	56
SecLang_Sup	Correlation Coefficient	-.129	.173	1.000
	Sig. (2-tailed)	.342	.203	
	N	56	56	56

Table 1- Correlations between Proficiency and SecLang_Reap and SecLang_Sup

I did not find any significant correlations between proficiency level and second language reappraisal scores ($\beta=0.239, p=0.077$) or suppression scores ($\beta=-0.129, p=0.342$) indicating that a participant's proficiency level in their second language did not impact their reappraisal or suppression scores statistically significantly.

To examine whether there was a significant difference between correlations of proficiency and reappraisal versus proficiency and suppression, I conducted a Fischer's r to z test. The difference in correlations for proficiency and reappraisal versus proficiency and suppression was close to significant ($z=-1.44, p=0.06$) indicating that proficiency had a significantly higher correlation with reappraisal than suppression which suggests that there is a discrepancy between reappraisal and suppression.

I also wanted to confirm that all the second language ERQ questionnaires were reliably and accurately translated from the original English version of the questionnaire. To do this, I conducted a Pearson correlation analysis between English and the participant's Second Language reappraisal and suppression scores. Refer to Table 2.

		Eng_Reap	Eng_Sup	SecLang_Reap	SecLang_Sup
Eng_Reap	Pearson Correlation	1	.051	.839**	.076
	Sig. (2-tailed)		.666	<.001	.578
	N	75	75	56	56
Eng_Sup	Pearson Correlation	.051	1	.038	.797**
	Sig. (2-tailed)	.666		.781	<.001
	N	75	75	56	56
SecLang_Reap	Pearson Correlation	.839**	.038	1	.172
	Sig. (2-tailed)	<.001	.781		.205
	N	56	56	56	56
SecLang_Sup	Pearson Correlation	.076	.797**	.172	1
	Sig. (2-tailed)	.578	<.001	.205	
	N	56	56	56	56

** Correlation is significant at the 0.01 level (2-tailed).

Table 2- Correlations between Eng_Reap, Eng_Sup, SecLang_Reap and SecLang_Sup

The English and second language reappraisal scores ($\beta=0.839, p<.001$) and suppression scores ($\beta=0.797, p<.001$) were significantly positively correlated with each other indicating that participants gave uniform responses to the English and second language questionnaires across both the reappraisal and suppression facets implying that the second language questionnaires were accurately translated from the English questionnaire.

DISCUSSION

The role of the languages we speak in how we experience and regulate our emotions is especially important to explore in present times, given the dynamic nature of language and its increasing adoption by non-native speakers. There has been previous literature that has established the role of language in how we perceive our emotions (Beck et

al., 2012; Monopoli & Kingston, 2012). Further, past research has also explored the role multilingualism plays in the regulation of our emotions (Panayiotou, 2004 ; Pavlenko, 2006). However, there is a gap in the literature with regards to how the lexical distances between languages may influence the different facets of emotional regulation (cognitive reappraisal and expressive suppression). Given the importance of better understanding how the structure of the languages we speak influence our emotional experience, I explored lexical distance as a predictor of emotional regulation across its two facets of reappraisal and suppression. I also looked into whether the number of languages a person speaks predicts how well they are able to regulate their emotions.

I found that multilingual speakers did not perform better or worse in the ERQ than monolingual speakers indicating that language status does not significantly influence emotional regulation. With regards to my main hypothesis, there was no significant interaction between lexical distance and emotional regulation scores. However, lexical distance played a more significant role in cognitive reappraisal than in expressive suppression. Further, there was no significant correlation between second language proficiency and emotional regulation scores, although proficiency had a significantly higher correlation with cognitive reappraisal than expressive suppression.

Language status not being a significant predictor of emotional reappraisal or suppression scores contradicts previous studies that were able to successfully demonstrate a significant relationship (Bright et al., 2019 ; Pavlenko, 2006). This discrepancy might have something to do with the fact that while multilingualism has been shown to have cognitive and social benefits (Bright et al., 2019 ; Pavlenko, 2006), its direct impact on emotion regulation may be limited. Multilinguals may use similar emotion regulation strategies in both of their languages, or they may use different strategies depending on the context and their personal preferences. If the choice of emotion regulation strategies is similar across languages, then multilinguals may not show a significant difference in their ERQ scores compared to monolinguals.

Further, the items used to assess emotion regulation, such as the ERQ, may not be sensitive enough to detect subtle differences between multilinguals and monolinguals. These tasks may not take into account the specific demands of multilingual communication,

such as language switching or code-switching, which could affect emotion regulation. If the items used to assess emotion regulation do not differentiate between bilinguals and monolinguals, then bilinguals may not show a significant difference in their ERQ scores compared to monolinguals. This reason is consistent with previous findings that established that the true effects of multilingualism are only observable when the subject is speaking, reading, or thinking in the target language. It is not enough to only possess knowledge of another language, but it is essential to be actively engaging with it (Panayiotou, A., 2004).

Lexical distance not being a significant predictor of emotional regulation across its two facets of cognitive reappraisal and expressive suppression is in contrast to my theory based on past research that found that languages denote categories for emotions differently (Lindquist et al., 2015) and hence, languages with a greater lexical distance relative to English may have more nuanced and novel ways of thinking about emotions.

There are a few potential explanations for why lexical distance may not significantly affect emotional regulation. Firstly, multilingualism is a dynamic and complex system that involves various linguistic, cognitive, and social factors. The impact of multilingualism on emotional regulation may depend on the interaction between these factors and their complex feedback loops (Larsen-Freeman & Todeva, 2021; Kramsch, C. et al., 2002). For example, the effect of lexical distance on emotional regulation may be modulated by factors such as language proficiency, language switching frequency, and social context. Secondly, emotional regulation is influenced by individual differences in personality traits such as neuroticism, extraversion, and conscientiousness. Bilingualism and lexical distance may not have a significant effect on emotional regulation if these individual differences are more influential (McCrae, 2001). For example, a highly neurotic bilingual may have more difficulty regulating emotions than a less neurotic monolingual, regardless of the number of languages or the lexical distance between them. Lastly, this discrepancy in findings might have something to do with the fact that my sample was not all at the same level of proficiency and the effect of lexical distances may only be apparent among native/bilingual speakers who can actively think and read in that language (Panayiotou, A., 2004).

Another aspect of my hypothesis was to examine whether there was a difference in the effect of lexical distance across the two facets of emotional regulation: cognitive reappraisal and expressive suppression. My findings provide adequate evidence that lexical distance did in fact affect cognitive reappraisal scores more significantly than expressive suppression scores. There could be a few potential explanations for this phenomenon.

Firstly, the degree of lexical distance between languages may reflect cultural differences in emotion regulation. For example, cultures with more words to describe specific emotions may place a greater emphasis on emotional expression and validation. In contrast, cultures with fewer words for specific emotions may value emotional restraint and control. Multilingual individuals who navigate between different cultures may be more aware of these cultural differences and adjust their emotion regulation strategies accordingly (Mesquita, B. et al., 1997 ; Mesquita, B, et al., 1992). Secondly, Expressive suppression involves inhibiting the expression of emotions, which may require a certain level of linguistic and cognitive load. Multilingual individuals may experience greater linguistic and cognitive load when inhibiting the expression of emotions in a non-native language, which may lead to reduced effectiveness of expressive suppression. In contrast, cognitive reappraisal involves the reinterpretation of a situation, which may be less affected by linguistic and cognitive load (Gross & John, 2003).

Further, my results indicate that a participant's proficiency in their second language was close to significantly correlated with a positive change in reappraisal scores than suppression scores and hence, lend more evidence to back the claim that there may be more of a cultural and cognitive influence on individuals who possess native/bilingual proficiency. These findings warrant further research into the potential explanations for why language and multilingualism may impact cognitive reappraisal more than expressive suppression.

My results also suggest that more emphasis should be placed on multilingualism and lexical distance as key predictors of cognitive reappraisal of emotions since they appear to be more significant in explaining cognitive reappraisal than expressive suppression. Emphasis should be placed on people learning new languages as tools to improve emotional reappraisal outcomes.

Despite trying my best to keep this research as scientifically rigorous as possible, there were some limitations to this present study. The biggest and most salient limitation was the presence of demand characteristics as a result of time constraints and hence, participants responding to the same survey in two different languages right after one another which may have subdued the significance of the results due to very similar responses across the two surveys. Additionally, the absence of consistently high proficiency participants in the sample may have contributed to this further by making participants who were not of native/bilingual proficiency respond to the second language survey in a similar fashion to the English survey due to a lack of understanding of the survey translations.

Furthermore, I had a disproportionate number of participants in the low lexical distance category as compared to the high lexical distance category which may have skewed the results due to a lack of high lexical distance language data. Lastly, there was a lack of a truly randomized and representative sample. My sample was largely undergraduate college students within a small age range most of which were not native/bilingual speakers and hence, this sample does not accurately represent the vast diaspora of multilingual speakers.

Based on previous research (John & Gross, 2003; Panayiotou, A., 2004; Pavlenko, 2006; Bright et al., 2019; Beck et al., 2012; Monopoli & Kingston, 2012) and the present study, future research should further examine the effects of lexical distance on emotional regulation and the differences between its two facets of cognitive reappraisal and expressive suppression with the utilization of a larger randomized sample that is more representative of the general population and a research design that minimizes the impact of demand characteristics. This will help in uncovering whether there is a true statistical effect of lexical distance on our emotional regulation and how it may influence reappraisal and suppression differently. To confirm my own results, more precise and specialized studies should be conducted by increasing the number of items and emotion tests to measure each variable which would help increase the reliability and validity of our results. Future research should also go beyond a self-report measure for emotional regulation and include true observable evidence of emotional regulation in order to avoid response bias from influencing participants to provide socially desirable

responses with respect to their ability to reappraise and suppress their emotions.

However, in spite of the limitations, the results of this present study highlight the role of language and proficiency in our ability to reappraise our emotions effectively. This is especially relevant in modern times given the cross-cultural flow of language and the need for people to be able to emotionally adapt to changing climates, geopolitical landscapes, and global health perspectives. The impact of language on our psychology and emotions is a topic of immense importance, with implications that reach far beyond our daily conversations. Our ability to communicate in different languages shapes the very fabric of our social interactions and relationships, influencing our personal and professional lives in profound ways. But it's not just about language; our emotional experiences are deeply tied to the way we express ourselves, and the languages we use to do so can have a significant impact on our mental and physical well-being. Ultimately, gaining a better understanding of how language impacts our psychology and emotions can help us to lead happier, more fulfilling lives and promote better communication and understanding between individuals from different linguistic and cultural backgrounds.

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1. ____ When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about.
2. ____ I keep my emotions to myself.
3. ____ When I want to feel less negative emotion (such as sadness or anger), I change what I'm thinking about.
4. ____ When I am feeling positive emotions, I am careful not to express them.
5. ____ When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm.
6. ____ I control my emotions by not expressing them.
7. ____ When I want to feel more positive emotion, I change the way I'm thinking about the situation.
8. ____ I control my emotions by changing the way I think about the situation I'm in.
9. ____ When I am feeling negative emotions, I make sure not to express them.
10. ____ When I want to feel less negative emotion, I change the way I'm thinking about the situation.