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Implicit Attitudes Of Ethnicity And Language: Evaluative And Associative Priming

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IMPLICIT ATTITUDES OF ETHNICITY AND LANGUAGE:

EVALUATIVE AND ASSOCIATIVE PRIMING

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ABSTRACT

Most members of minority groups belong to both an ethnic and a linguistic minority. The interplay between these two related yet independent constructs has not been explored. For this reason, this study examined language attitudes following the theoretical model of social categorization by using implicit measures. This study also investigated the implicit association between language and ethnicity. In this manner, the relationship that exists between attitudes towards minority groups and attitudes towards minority languages can be disentangled. A simultaneous study of implicit attitudes of ethnicity and language, and the association between ethnicity and language, may elucidate possible mechanisms involved in prejudice for both ethnic and linguistic minorities.

In a series of six sequential priming experiments, implicit ethnic attitudes, the association between ethnicity and language, and attitudes towards language were explored. Participants were Mexican-Americans, who were fluent Spanish-English bilinguals, Mexican-Nationals who were Spanish-dominant and Anglo-Americans who were English-dominant.

Experiments 1 and 2 examined ethnic attitudes. Experiment 1 examined the effect that a photograph of an Anglo-American or a Mexican-American had on the processing of valenced words. In Experiment 2, the prime and target were reversed, such that a positive, a negative, or a neutral word was presented first and a face of either an Anglo-American or Mexican-American was subsequently presented. In Experiment 1 although the result was marginally significant, it was found that Anglo-Americans showed an in-

group positivity bias. In Experiment 2, Mexican-Americans showed ethnic in-group positivity bias and Mexican-Nationals showed in-group negativity bias.

Experiments 3 and 4 examined the relationship between ethnicity and language. Experiment 3 examined the effect that an Anglo-American or a Mexican-American face has on the processing of a neutral English or Spanish word. In Experiment 4, the prime and target were reversed, such that a neutral English or Spanish word was presented first and a photograph of an Anglo-American or Mexican-American was subsequently presented. In Experiment 3, English-dominant Anglo-Americans associated Anglo-Americans with English and Mexicans with Spanish. In Experiment 4, for both the Mexican-American bilinguals and the Anglo-American English-dominant sample, English was associated with Anglo-Americans. For Anglo-Americans, Spanish was associated with Mexicans.

Experiment 5 and 6 examine language attitudes. In Experiment 5, a neutral English or Spanish word was presented as a prime to examine the effect it had on processing a word with a positive or negative valence. In Experiment 6, the prime and the target were reversed; a positive or negative word was presented as a prime whereas a neutral English or Spanish word was presented as target. In Experiment 5, Spanish- and English-dominant participants showed language out-group negativity bias. In Experiment 6, there was no evidence of in-group or out-group language bias for any of the samples.

The present study replicated previous research in ethnic attitudes and provides a new model for the study of implicit language attitudes. Ethnic and language attitudes are interpreted according to theories of social categorization. The interplay between ethnicity

and language contributes to the understanding of prejudice towards ethno-linguistic minorities.

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IMPLICIT ATTITUDES OF ETHNICITY AND LANGUAGE: EVALUATIVE AND ASSOCIATIVE PRIMING

Most minority groups belong to both an ethnic and a linguistic minority. The interplay between these two related yet independent constructs has not been explored. For this reason, this study seeks to examine language attitudes following the theoretical model of social categorization by using implicit measures. Moreover, this study investigates the implicit association between language and ethnicity. In this manner, the relationship that exists between attitudes towards minority groups and minority languages can be disentangled. A simultaneous study of implicit attitudes of ethnicity and language, and the association between ethnicity and language, may elucidate possible mechanisms involved in prejudice for both ethnic and linguistic minorities.

In a series of six experiments, the present study explores implicit and explicit ethnic attitudes, the association between ethnicity and language, and attitudes towards language. Participants were Mexican-Americans who were also Spanish-English bilinguals, Mexican-Nationals who were also Spanish-dominant speakers and Anglo-Americans who were also English dominant. Also, the role that ethnicity and language may play in implicit prejudice is explored. These experiments add to the limited research investigating Mexicans' ethnic attitudes toward Anglo-Americans. Moreover, for the first time, bilingualism is used as a tool to explore simultaneously associative and evaluative priming involved in ethnic attitudes. Furthermore, for the first time the implicit association between ethnicity and language, and the role of bilingualism in implicit language attitudes is investigated. Ethnic heritage and family's language may be

important for the individual's sense of cultural distinctiveness thus providing a sense of identity and belonging.

The United States is a highly multilingual country hosting a wide variety of immigrant groups. According to the United States 2010 census bureau, the Hispanic population accounted for more than half of the increase in the total U.S. population, and Spanish was the most frequently spoken language at home after English. Mexicans in the US are considered ethno-linguistic minorities because they lack the political, institutional and ideological structures, which can guarantee the relevance of their culture and language in everyday life (Nelde et al, 1995). As a result, language of the majority group is spoken in economical, political and educational domains. Despite the fact that Hispanics represent a substantial portion of the U.S. population, little attention has been paid to the intergroup dynamics underlying ethnic and language identity.

Evaluation of Social Categories

According to the Social Identity Theory (SIT; Tajfel & Turner, 1979), a person's self concept is derived from belonging to group memberships. Individuals who are perceived to be similar are labeled the in-group while those who are perceived to be different are labeled the out-group. According to this theory, individuals are motivated to develop and maintain group identities that make them unique and better than members of other groups. This can be achieved in two manners. The first is a positive bias for in-group members, which is also described as in-group favoritism. The second is a negative bias for out-group members, which is described as out-group discrimination. (In this study, the terms positivity bias and negativity bias will be used given that the term discrimination implies a behavioral component.) These effects are stronger for people

who identify more strongly with their groups (Perreault & Bourhis, 1999). In general, people are more likely to favor their in-groups over out-groups, but they tend not to act negatively against the out-groups (Taşdemir, 2011). The SIT is characterized by its evaluative nature, such that social groups are associated with positive or negative value connotations (Taşdemir, 2011). Hence, the SIT emphasizes group evaluations.

Contrary to the expectations of the SIT, individuals may hold attitudes that may be contrary to their own interests. For example, in some instances individuals from low-status groups may favor the out-group. According to the *System Justification Theory* (SJT; Jost, Banaji, & Nosek, 2004), some individuals from low-status groups may endorse the status quo and internalize their own sense of inferiority. As a consequence, some members of disadvantaged groups may favor the out-group instead of the in-group. The SIT and the SJT among other categorization theories try to account for the motivations of minority groups for out-group favoritism. These motivations may vary from minority members seeking to maintain the status quo to minority desire to be associated with majority members rather than with minority members. Despite theoretical differences among social categorization theories, they all seek to understand how social groups are evaluated.

Language Attitudes

The effect that belonging to minority or majority groups has on individuals' attitudes has been explored in the area of social cognition extensively; however, language as a form group membership has been neglected. Among the few studies exploring language attitudes is the research by Kraemer and Birenbaum (1993) who explored language attitudes of Jews and Arabs towards Hebrew, Arabic and English. They found

that Jews demonstrated positive attitudes towards Hebrew and English, and Arabs showed positive attitudes towards Arabic. Moreover, they found that Arabic was an overwhelming factor in Arab's identity. Therefore, Kraemer and Birenbaum (1993) found language in-group favoritism for Jews and Arabs.

Research from the area of psycholinguistics has examined the effects of belonging to linguistic minorities. For example, Edwards (1982) mentions that speakers of regional patterns, minority groups, and lower-class populations (often apply to the same group) evoke unfavorable reactions in terms of status and prestige. Speech samples may evoke stereotypes of the speaker's group and serve as a speech cue to make judgments of socioeconomic status. Brennan and Brennan (1981) found that Mexican-Americans were given lower status ratings as their degree of accent increased. If there is an association between language cues and stereotypic information, it is important to find how this relationship is activated. It is possible that language itself is part of the stereotypic information. Therefore, language may be used as a cue for stereotype activation or as a proxy for ethnic attitudes in particular towards Hispanics who belong to both language and ethnic minorities.

Past research on language attitudes has employed traditional direct or explicit techniques. The most common technique is the matched-guise technique where a panel of judges is asked to evaluate recordings of speeches and then rate the characteristics of their speakers (for a review, Garret, 2010; Lambert, Hodgson, Gardner & Fillenbaum, 1960). In this technique, the same speaker may provide the same speech passages in different languages or accents in order to control for voice, speed, and pitch. Impe, Geeraerts, Speelman and Spruyt (2009) adapted the matched-guise technique by using

auditory primes of regional accents with an implicit attitudes technique to investigate language attitudes. Unfortunately, this research remains unpublished and little information is provided over the methodology and results of the study.

The study of language attitudes has been limited in the area of psycholinguistics but has been studied using social cognition paradigms. The study of language attitudes may play an important role in the understanding of ethnic attitudes. The most effective measurement of ethic attitudes is by the use of implicit attitudes. Therefore, the study of implicit language attitudes would be beneficial in the understating of ethnic implicit attitudes

Implicit and Explicit Measures

Attitude as a psychological construct is described as an individual's evaluation of like or dislike for an object. The evaluation of the item can be positive, negative or neutral. Albarracín, Zanna, Johnson and Kumkale (2005) state that people's evaluations of an object can be represented in permanent memory or as judgments, and attitudes may have a reciprocal influence on beliefs, affect and overt behaviors. Although an attitude object may automatically activate an evaluation from memory, it does not determine that this attitude will be used as is. Therefore, a distinction is made between the activation of an attitude by an automatic process and the application of an attitude by a controlled process.

Krosnick, Judd and Wittenbrink (2005) distinguish between three stages of attitudinal evaluation process: (a) an initial spontaneous activation of memory contents, (b) a deliberation phase, and (c) a response phase. In the automatic activation phase, an attitude object may elicit evaluations that are automatic, without intent, effort, or even conscious

awareness. Initial evaluations are thought of as automatic activations of associations in long-term memory, physiological feedback effects and fluency effects. In the deliberation phase, individuals search for relevant information associated with the attitude object. The extent of the deliberation may depend on the individuals' motivation to spend time and effort on this process given that they have the opportunity and resources to do it. In the response phase, the individual expresses an overt response, which may be the result of an automatic, or a deliberate process. Implicit measures are intended to assess automatic mental associations, whereas explicit measures assess how much an individual consciously endorses a belief.

Implicit and explicit measures have been investigated extensively. However, there is a debate as to the definition of these two measures (for reviews see, De Houwer, 2006; De Houwer, Teige-Mocigemba, Spruyt & Moors, 2009). The definition of an "implicit" measure is that implicit measures a) do not directly involve direct questioning about the attitude object, and b) there is less opportunity for people to exercise control over their responses. In this study, no assumptions are made about whether individuals are aware of their attitudes or not. Therefore, the measures and not the attitudes are described as implicit or explicit as suggested by Fazio (2001).

Over the past few years, implicit and explicit measurement techniques have been used in social cognitive research to study socially sensitive topics. Implicit measures are less likely to be biased by motivational influences than are explicit measures. For example, individuals' motivation to express negative ethnic attitudes may be influenced by social desirability, or the endorsement of egalitarian beliefs. Individuals may feel motivated not to report their attitudes. For example, the correlation between explicit and implicit

measures is low for socially sensitive topics such as prejudice towards minority groups, but high for mundane topics such as consumer preferences (Hofmann, Gawronski, Gschwender, Le & Schmitt, 2005). However, other factors may also influence the dissociation between implicit and explicit measures (for a review, see Hofmann et al., 2005).

A theoretical model proposed by Fazio and Towles-Schwen (1999) seeks to explain differences between implicit and explicit measures due to motivational factors. The motivation and opportunity as determinants (MODE) model proposes that attitudes can exert influence through relatively spontaneous processes or through more deliberate processes (Fazio & Olson, 2003). According to the MODE model the magnitude of the relationship between an explicit and an implicit measure will depend on the opportunity and motivation to deliberate. If there is no opportunity or motivation to deliberate, then the two measures will correlate. However, if there is opportunity and motivation to deliberate, then the implicit and the explicit measure will not correlate. When motivation and opportunity are low, behavior is expected to be a function of the automatically activated attitude, which is reflected in the implicit measure. On the other hand, if motivation and opportunity are high, then behavior is expected to be a function of the motivating forces, which are reflected in the explicit measure. According to this model, when motivation is low, either with or without the opportunity to deliberate, similar attitudes are expected in both explicit and implicit measures. Therefore, issues that are not socially controversial may elicit a similar response in both measures, but socially controversial topics will elicit different responses for the two measures.

Associative and Evaluative Priming

Sequential priming is a paradigm used to implicitly assess association in semantic memory. Priming is defined as "an improvement in performance in a perceptual or cognitive task, relative to an appropriate baseline, produced by context or prior experience" (McNamara, 2005, p. 3). In a sequential priming task, the presentation of the "prime" stimulus (e.g., bread) is presented for a fraction of second then it is followed by a "target" stimulus that is either semantically related (e.g., butter) or not (e.g., chair). Participants make a response or judgment related to the target stimulus. For example, in a lexical decision task, participants make a decision whether the target presented is a word or non-word. The premise of semantic priming is that responses to the target are faster and more accurate when the prime and target are semantically related than when they are not. Semantic priming may be due to the relatedness of two words on the basis of semantic category or the degree of association between two words that may not necessarily share a meaning. In semantic priming, it is assumed that true relations of meaning derive priming. In associative priming, two words may be related by use or association. Priming may occur for pairs that are both semantically and associatively related (e.g., doctor-nurse). However, it is also possible for words to be highly associated but not semantically related (e.g., coat-rack). However, most semantically related pairs are also highly associated, for this reason, the term semantic priming usually refers to both semantic and associative relations. In this study, nonetheless, the relation between ethnicity and language may be mostly associative in nature, for this reason, the term *associative priming* is preferred.

Another paradigm adapted from semantic priming is the *evaluative* or *affective priming* paradigm, which assesses the association between the attitude object and a positive or negative evaluation. The assumption made is that evaluative priming measures the extent to which the presentation of an object automatically activates an associated evaluation from memory. The premise of evaluative priming is that one may measure the attitude towards the prime stimulus by examining how the presence of the prime influences the speed of evaluative categorization of the target stimulus. For example, in order to measure attitudes towards Mexicans and Anglo-Americans individuals, one can present on each trial the picture of a stereotypical Mexicans or an Anglo-Americans individual as a prime stimulus followed by a positive or negative target word that participants categorize as either positive or negative (e.g., Fazio, Jackson, Dunton, & Williams, 1995). If an Anglo-Americans face facilitates responding to positive relative to negative target words then this will be indicative of a positive attitude towards Anglo-Americans individuals. If Anglo-American faces facilitate responding to negative relative to positive target words, this would be indicative of negative attitudes towards Anglo-Americans individuals. In the same manner, attitudes towards Mexicans are investigated by using Mexican faces as primes and how they facilitate responding to positive or negative targets. The assumption is made that affective processes influence or underlie evaluative decisions to a great extent, but not necessarily completely. For this reason, in the present study, a distinction is made between the evaluative nature of task and the underlying affective processing, and the term *evaluative priming* is preferred.

Mechanisms of Priming

Spreading of activation and response competition are the two cognitive mechanisms that underline semantic and evaluative priming effects. The theory of spreading activation (Collins & Loftus, 1975) proposes that exposure to the prime activates related concepts within the same semantic network. In such a conceptualization, if the node representing "pencil" was activated, the activation would spread to nodes representing related items. As a result, after hearing or seeing the word "pencil," people would retrieve or recognize words such as "paper" or "pen" faster than they would retrieve or recognize words such as "sleep" or “queen”, because concepts related to pencil have already been activated. Therefore, in a priming task, the target receives some activation prior to the actual presentation of the target stimulus. Consequently, less time is needed for the identification of the target when the prime and the target are related. The magnitude of the facilitation observed with a particular prime and target may serve as an indicator of the strength of association between the prime and target concepts. A current debate in the field is whether concepts are organized by semantic or evaluative relatedness. It is possible that concepts are organized by both semantic and evaluative attributes and the priming effect may be driven by the how salient a prime-target pair is on those dimensions, task demands and allocation of attention.

An alternative mechanism that explains priming effects involves response competition and/or facilitation. When the prime and target are semantically (or affectively) congruent, responding is facilitated because the same path has been activated. The processing of the prime triggers a response and when the target is subsequently presented, the congruent response to the target is facilitated. For example, in the Stroop effect, participants are shown a color word in a congruent or incongruent ink color. When

participants read the word "GREEN" and it is presented in green color ink, they are faster at naming the color of ink. When prime and target are not congruent, the biased response of the prime interferes with the target response therefore taking more time to process. The main difference between the two proposed mechanisms is that either the prime or the target plays the determinant role. For example, in spreading of activation, the prime activates a related node, and the focus is in the role of the prime plays in extending its activation to the target. In response competition, the congruency of the target as related to the prime derives the priming mechanism in which the target plays the determinant role.

The mechanisms responsible underlying evaluative priming effects are debated. The semantic priming effect is robust and has been replicated in several tasks. However, the evaluative priming effect has been found only when targets were categorized on an evaluative task (i.e., good vs. bad) but not when the targets were categorized semantically (i.e., person vs. animal, De Houwer, Hermans, Rothermund & Wentura, 2002). In these studies, the valence of the prime has an influence on the target only when the valence of the target is being evaluated. In the same manner, when the target's valence is not being evaluated then there is no evidence of evaluative priming. Therefore, congruity effects between the prime and target are the driving mechanism and these studies support response competition as the mechanism underlying evaluative priming (De Houwer, Hermans, Rothermund & Wentura, 2002; Klauer and Musch, 2002).

In contrast, Spruyts, De Houwer, Hermans and Eelen (2007) found evaluative priming in a non-evaluative task when participants were instructed to pay attention to the evaluative dimension. In this study, positive and negative pictures were used as primes

and targets. The target pictures portrayed either animals or objects and the primes portrayed complex real life scenes. In the non-evaluative condition, participants were asked to categorize the target as objects or animals. As mentioned before, spreading activation involves the activation of concepts that are more closely associated, which is based on the number of features in common between the two concepts (Bargh, Chaiken, Raymond & Hymes, 1996). The nature of this association between the two concepts is assumed to be solely on the basis of meaning. However, the association between two concepts may also be based on valence. Therefore, evaluative priming effects may be due to the strength of evaluative association between the prime and the target and the response congruity between the valence of the prime and target. A neglected area of research in social cognition has been the study of semantic and evaluative processes that may occur simultaneously.

The Present Study

As mentioned before, this study investigates associative and evaluative biases related to language and ethnicity by using implicit and explicit measures. In six sequential priming studies, the directionality and the strength of associations among language, evaluative bias and ethnicity are examined (Figure 1). The six priming studies were conducted in three samples, Mexican-Americans who were English-Spanish bilinguals, Mexican-Nationals who were Spanish-dominant speakers and Anglo-Americans who were English-dominant speakers. Following a within-subjects design, the three samples completed the six experiments. The basic premise of sequential priming is that when the attitudes towards the prime and target are evaluatively congruent, reaction times are faster than when the attitudes are evaluatively incongruent. The difference in response

times for congruent and incongruent trials represents the participant's level of implicit bias.

Experiment 1 and 2 examined ethnic attitudes. Experiment 1 examined the effect that a photograph of an Anglo-American or a Mexican-American had on the processing of valenced words. In Experiment 2, the prime and target are reversed, such that a positive, a negative, or a neutral word was presented first and a face of either an Anglo-American or Mexican-American was subsequently presented. Thus, Experiment 1 explored the effect of ethnicity on valence evaluations, and Experiment 2 examined the effect of valence on ethnicity categorization. Thus, Experiment 1 examined evaluative priming whereas Experiment 2 examined associative priming that may occur between valence and ethnicity.

Experiment 3 and 4 examined the relationship between ethnicity and language. Experiment 3 examined the effect that an Anglo-American or a Mexican-American face has on the processing of a neutral English or Spanish word. In Experiment 4, the prime and target were reversed, such that a neutral English or Spanish word was presented first and a photograph of an Anglo-American or Mexican-American was subsequently presented. Thus the effect that ethnic categorization had on language categorization was studied in Experiment 3 and the effect that language had on ethnicity categorization was explored in Experiment 4. These two experiments examine the directionality of associative priming that may occur between ethnicity and language.

In Experiment 5, a neutral English or Spanish word was presented as a prime to examine the effect it had on processing a word with a positive or negative valence. In Experiment 6, the prime and the target were reversed; a positive or negative word was

presented as a prime whereas a neutral English or Spanish word was presented as target. Thus, Experiment 5 explored the effect that language had on valence evaluations, and Experiment 6 examined the effect that valence had on language categorization. Experiment 5 examines evaluative priming whereas Experiment 6 examines associative priming that may occur between valence and language.

GENERAL METHOD

Participants

Mexican-American Spanish-English bilinguals. The research participants were 120 self-identified Mexican-Americans (76 women, 44 men) recruited primarily from introductory psychology classes at the University of Texas at El Paso. All the participants self-identified as fluent Spanish-English bilinguals. Most of the participants (104) reported having learned Spanish before they started learning English; Two had learned English before Spanish; and 14 had learned both languages simultaneously. The mean age at which participants reported beginning to learn the second language was 5.48 years old, and the modal age was 5, corresponding to the age that children start kindergarten in the United States. Given that the mean age was 20.08 (*SD* = 4.19) years, they had on average 15 years of experience with their second language, and continued exposure to the first language. According to self-ratings of relative proficiency, 57.5% were classified as English dominant, and 42.5% were classified as Spanish dominant. On average, they reported that over the preceding month they had used English 45% of the time, Spanish 40% of the time, and a mixture of the two languages 15% of the time. All participants in this study were highly proficient speakers of Spanish and English who used both languages regularly. Twelve additional participants completed the protocol but were excluded because they were not bilingual or for failure to follow instructions.

Mexican-National Spanish -dominant speakers. The research participants were 36 self-identified Mexican Nationals (26 women, 10 men) recruited primarily from introductory psychology classes taught in Spanish at the University of Texas at El Paso. The mean age was 19.61 (*SD* = 1.71). All the participants self-identified as fluent Spanish

speakers. Although these participants were learning English while attending an American university, these participants spoke English regularly but with a very low proficiency. All participants reported having learned Spanish before they started learning English. The mean age at which participants reported beginning to learn English was 10.42 (SD = 4.42) years old, and the modal age was 13. On average, they reported that over the preceding month they had used English 31% of the time, Spanish 60% of the time, and a mixture of the two languages 9% of the time. Nine additional participants completed the protocol but were excluded because of experimental programming error.

English speakers of Anglo-American origin. The participants were 33 self-identified Anglo-Americans (27 women, 6 men) recruited primarily from introductory psychology classes at The University of New Mexico at Carlsbad. The mean age was 29.49 (*SD* = 11.56). Twelve participants reported that they did not have any knowledge of Spanish. Other participants had some knowledge of Spanish but they had very low proficiency. The mean age at which those participants reported beginning to learn Spanish as a second language was 11.24 (SD = 4.5) years old, and the modal age was 12. On average, they reported that over the preceding month they had used English 98% of the time, Spanish 1.80% of the time, and a mixture of the two languages 0.20% of the time. None of the participants were excluded.

Apparatus

Stimuli were presented on a Macintosh MacBook Pro computer with a refresh rate of 60Hz and a 13-inch monitor. PsyScope X B57 software was used to control the sequence and timing of stimuli and responses.

Experimental Materials

Word stimuli. The stimuli included 60 stimulus words and are listed in Appendix A. Twelve positive, 12 negative and 12 neutral nouns in both English and Spanish were selected on an individual basis from a larger set of 1040 English-Spanish word norms (Redondo, Fraga, & Comesaña, 2005). Eight nouns for each group were critical experimental items while the other four were used in practice trials. The selection criteria for these nouns was that: A) The English and Spanish translations of the stimulus words were similar in evaluative valence, hence they are not more positive or negative in one language than the in the other language; B) The selected words were both familiar and unambiguous to the local bilingual population; C) nouns did not include cognates or homophones. D) All nouns had two syllables.

For bilingual participants, positive and negative words used as primes and targets were presented in both languages. However, for non-bilingual participants, it was necessary to take into account that participants must know the meaning of a prime word in order for prime valence to have an effect on the target or the meaning of a target for it to be categorized based on its valence. Thus, the positively and negatively valenced words were presented only in Spanish for the Spanish-speaking participants and only in English for the English-speaking participants.

Photograph stimuli. Photographic stimuli were color images of headshots against common background. Twenty-four photographs of Anglo-Americans and Mexican individuals were selected on the basis of a preliminary rating study in which participants (N = 60) rated the stereotypicality and attractiveness of 120 photographs on a 7-point rating scale ranging from 1 (*not at all*) to 7 (*extremely*). Eight of the photographs were

used for practice trials while the other 16 for experimental trials. Half of the selected photographs depicted individuals who can be identified as from Mexican origin whereas the other half depicted individuals from an Anglo-American origin. Also, half of the photographs depicted women and the other half men. Photographic stimuli were selected to include the most stereotypic faces and to control for attractiveness and age as done in previous research investigating implicit ethnic attitudes (Livingston & Brewer, 2002). There was no difference in rating of stereotypicality between faces of Mexican-descendent (M = 5.44, SD = 0.21) and Anglo-Americans (M = 5.48, SD = 0.16). Also, there was no difference in ratings of attractiveness between Mexican-Americans (M = 2.83, SD = 0.54) and Anglo-Americans (M = 2.82, SD = 0.42).

Self-Report Measures

Language questionnaire. Participants were asked questions related to their language proficiency in English and Spanish. Language proficiency ratings are shown in Appendix B. They were asked to rate their spoken proficiency on a continuous scale from "A" (I speak only English) to "I" (I speak only Spanish), and "E" being the midpoint (I speak English and Spanish with equal fluency). Participants rated their skill in different domains (speaking, listening comprehension, reading, writing, pronunciation/accent, spelling, vocabulary and grammatical errors) on a 7-point Likert scale. Higher ratings reflected a greater language proficiency in Spanish relative to English. In the same manner, lower rating reflected a greater language proficiency in English relative to Spanish.

Procedure Overview

Participants were tested individually and completed a consent form. Bilingual and English-dominant speakers were instructed, given materials and participated experiments in English whereas Spanish-dominant did it in Spanish. Experimenters were of the same ethnicity as the participants. The experimenter explained to participants that they were completing a series of experiments in the computer and that upon completion they would receive a language questionnaire. The word and photographic stimuli were presented in 4 different orders. The series of experiments consisted of 3 baselines and 6 experiments. The six experiments were presented in 6 orders in a counterbalanced manner using a balanced Latin square. Baselines were presented first followed by the two corresponding experiments, which were counterbalanced within each block. Baselines and experiments were blocked so that the valence categorization was followed by Experiments 1 and 5. Ethnic categorization was followed by Experiment 2 and Experiment 4. Language categorization was followed by Experiments 3 and 6. There were 12 possible combinations. At the end of the study, participants were debriefed and thanked for their participation.

BASELINE MEASURES OF VALENCE, ETHNICITY, AND LANGUAGE, CATEGORIZATION

The main experiments in this study addressed whether the valence, ethnicity, or language of a prime stimulus would impact the time needed to categorize a target based on valence, ethnicity, or language. In order to measure the effects of the prime stimuli, it was necessary to measure categorization times in the absence of prime stimuli to provide baselines against which to compare primed categorization times. For this reason, three sets of baseline response times were collected from each of the three participant samples. The response times for valence categorizations were used as baselines for Experiment 1 and 5. The response times for ethnicity categorizations were used as baselines for Experiment 2 and 4. The response times for language categorizations were used for Experiment 3 and 6.

Valence Categorization

Method

In order to obtain the baseline for valence, participants were instructed to categorize a word as either positive or negative by pressing the "z" or the "/" keys respectively as fast as they could. The label "Positive" appeared in the left-upper quadrant while the label "Negative" appeared in the right-upper quadrant." Greenwald, McGhee and Schwartz (1998, Experiment 1) reported no effect of assigning either pleasant or unpleasant categories to right or left keys. Therefore, counterbalancing of key side to valence categories was not performed.

The labels were congruently mapped with the keys participants had to press for a correct classification and were kept consistent for Experiments 1 and 5. The 24 word

stimuli previously discussed were used. For bilingual participants, the experiment consisted of 16 practice trials and 96 experimental trials. For the English- and Spanish-dominant speakers, the experiment consisted of 16 practice trials and 48 experimental trials.

Results

Mexican-American Bilingual Sample. The data from trials on which an incorrect response was given were excluded from the analyses. In order to reduce the impact of outliers, response times deviating more than 2 standard deviations from the participant's means from each condition were also removed. The total number of excluded trials was on average 8.76%. The same standard was used for the rest of the experiments and samples. Note that all significance tests are reported without correction for multiple comparisons.

Response times are shown in Table 1. English words were categorized faster than Spanish words, $F = 11.731$, $MSE = 56{,}095$, $p < .001$. Positive words were categorized faster than negative words, $F = 14.529$, $MSE = 90{,}558$, $p < .001$. There was an interaction between language and valence, $F = 20.898$, $MSE = 74{,}128$, $p < .001$. This interaction is illustrated in Figure 2. Specifically, in Spanish, negative words ($M = 857$, $SD = 168$) were classified more slowly than positive words ($M = 804$, $SD = 181$), $t(119) = 6.11$, $p < .001$, but in English, valence classification times did not differ for negative words ($M = 810$, $SD = 147$) and positive words ($M = 808$, $SD = 170$), $p > .05$. Therefore at baseline, Spanish words may be associated more strongly with positive words than with negative words, but this is not the case for English words. Language dominance did not have an effect on the pattern of results.

Mexican-National Spanish-dominant Sample. Response times are shown in Table 1. The total number of excluded trials was on average 7.06%. A paired-samples t-test showed that positive words were categorized faster than negative words, $t(35) = 3.131$, $p < .01$.

Anglo-American English-dominant Sample. Response times are shown in Table 1. The total number of excluded trials was on average 13.75%. Numerically, positive words were categorized faster than negative words, but a paired samples t-test showed that this difference was not statistically reliable, $t(32) = 1.537$, $p = .134$.

Ethnicity Categorization

Method

Ethnicity categorizations were made according to the in-group and out-group. Therefore, Mexican-Americans classified photographs as either from a Mexican-American or an Anglo-American. Mexican-Nationals and Anglo-Americans classified photographs as either a Mexican or an Anglo-American. Mexican-Americans and Mexican Nationals were presented the same photographs given that no phenotypical differences were expected. However, there are cultural and ethnic self-identification differences were expected between Mexican-Americans and Mexican-Nationals.

In order to obtain the baseline for ethnicity, participants were instructed to categorize a photograph as either from a Mexican-American (or Mexican) or an Anglo-American individual by pressing the "z" or the "/" computer keys respectively as fast as they could. Each trial started with a 500-ms presentation of a fixation point. After a 100-ms. interval a photograph appeared in the middle of the screen. Concurrently, the label

"Mexican-American" appeared in the upper-left corner of the computer and the label "Anglo-American" appeared in the upper-right corner of the computer. (For the Mexican-Nationals the labels were presented in Spanish with the label "Mexicano(a)" and "Anglosajón(a)." For the Anglo-Americans, the label "Mexican-American" was changed to "Mexican.") The photograph and the labels remained on the screen until a response was made. Thereafter, there was an inter-stimulus interval of 500 ms. Labels were congruently mapped with the keys participants had to press for a correct classification and were kept consistent for Experiments 2 and 4.

The 24 photograph stimuli previously discussed were used. At the beginning of the experiment, participants completed a practice phase consisting of 16 photographs as to familiarize them with the procedure. The experiment phase consisted of 48 trials.

Results

Mexican-American Bilingual Sample. Response times are presented in Table 2. The total number of excluded trials was on average 8.59%. A paired-samples t-test showed that ethnicity categorization times for Anglo and Mexican-American photographs did not differ, $t(119) = 1.235$, $p = .219$.

Mexican-National Spanish-dominant Sample. Response times are shown in Table 2. The total number of excluded trials was on average 7.27%. A paired-samples t-test showed that Anglo-American photographs were categorized faster than Mexican photographs, $t(35) = 4.139$, $p < .001$.

Anglo-American English-dominant Sample. Response times are shown in Table 2. The total number of excluded trials was on average 10.72%. A paired-samples t-test

showed that Anglo-American photographs were categorized faster than Mexican photographs, $t(32) = 3.28$, $p = .002$.

Language Categorization

Method

The language categorization and ethnic categorization followed the same methodological logic and procedure and only differences are described below. In order to obtain the baseline for language, participants were instructed to categorize a word as either in Spanish or English by pressing the "z" or the "/" keys respectively as fast as they could. The label "Spanish" appeared in the left-upper quadrant while the label "English" appeared in the right-upper quadrant." The labels were congruently mapped with the keys participants had to press for a correct classification and were kept consistent for Experiments 3 and 6. The 24 word stimuli previously discussed were used. The experiment consisted of 16 practice trails and 48 experimental trials.

Results

Mexican-American Bilingual Sample. Participants categorized neutral words on the basis of language. Response times are shown in Table 3. The total number of excluded trials was on average 8.66%. A paired-samples t-test showed that there was no statistical difference between the time to categorize English and Spanish words, $t(119) = 1.861$, $p = .065$. There were no differences in the baseline conditions due to language dominance, $F < 1$.

Mexican-National Spanish-dominant Sample. Response times are shown in Table 3. The total number of excluded trials was on average 9.61%. A paired-samples t-test

showed that English words were classified faster than Spanish words, $t(35) = 2.746$, $p = .009$.

Anglo-American English-dominant Sample. are shown in Table 3. The total number of excluded trials was on average 9.29%. A paired-samples t-test showed that English words were classified faster than Spanish words, $t(32) = 3.03$, $p = .005$.

Discussion

Baseline response times were comparable among the three samples. Positive words were classified numerically faster than negative words for all three samples. These valence comparisons were statistically significant for the bilingual and Spanish-dominant sample, but not for the English-dominant sample. These findings are consistent with previous research that has found that positive objects are in general rated faster compared to negative objects (Unkelbach, Fiedler, Bayer, Stegmuller & Danner, 2008).

Anglo-American photographs were classified numerically faster than Mexican photographs for the three samples. This ethnicity comparison was significant for the Mexican-National and the Anglo-American samples but not for the bilingual sample. Therefore, Mexican-Nationals were faster at classifying the other-ethnicity group than own-ethnicity group and Anglo-Americans were faster at classifying the own-ethnicity group than other-ethnicity group. Research suggests that there are processing differences between own-ethnicity and other-ethnicity; for example, other-race photographs are classified faster than same-ethnicity photographs (Levin, 1996). However, the other-ethnicity effect has not been consistently found (Zhao & Bentin, 2008) as seen in this study.

Finally, English words were classified numerically faster than Spanish words. This language comparison was significant for the Spanish-dominant and English-dominant samples but not for the bilingual sample. It was expected that participants would classify other-language faster than own-language, but there were inconsistent results. Unfortunately, there is no empirical evidence to support this hypothesis.

EXPERIMENT 1:

THE EFFECT OF ETHNICITY ON VALENCE EVALUATIONS

The primary question in Experiment 1 was whether participants would show a positive attitude toward the ethnic in-group and/or a negative attitude toward the ethnic out-group. This question was addressed by examining the evaluative priming effect that the ethnicity of a prime photograph would have on the time needed to categorize positive and negative words on the basis of valence. A positive in-group attitude would be indicated by faster responses to positive words than negative words following a prime picture of the same ethnicity as the participant, and a negative out-group attitude would be indicated by faster responses to negative words than positive words following a prime picture of a different ethnicity from the participant.

Method

The design was a 2 (prime ethnicity: Anglo-American or Mexican-American) x 2 (target language: English or Spanish) x 2 (target valence: positive or negative) within subjects design. The dependent variable for all the experiments was response times for valence categorization.

The experimenter explained to participants that the study consisted of three steps and they would have to carry out two tasks. In the first step, they would see a fixation point. In the second step, a photograph of a Mexican-American or an Anglo-American would appear on the middle of the screen. (As previously mentioned in the baselines, Mexican-Nationals and Anglo-Americans participants were told that a photograph of a Mexican or Anglo-American would appear. This instructions were given when appropriate in the following experiments) In the third step, participants would see a

positive or negative word, which they would classify as quickly and accurately as possible using the corresponding computer keys. Participants' primary task was to categorize the target, in this case a word, as either positive or negative as quickly and accurately as possible. Participants' secondary task was to pay attention to the prime, in this case the photograph. This was done to assure that the participant attended the prime, but no actual recall of the prime was required at the end of the study. The instructions to pay attention to the prime and classify the target were maintained constant throughout all the experiments.

Before the start of the experiment, participants completed a practice phase consisting of 16 trials involving prime-target pairs as to familiarize them with the procedure. The experiment consisted of 64 prime-target pairs. (For the English- and Spanish-dominant speakers, the experiment consisted of 16 practice trials and 48 experimental trials.) Each trial started with a 500-ms presentation of a fixation point. On any given trial, the prime was presented for 200 ms, in this case a photograph, followed by a 100 ms interval before onset of the target, in this case a word. Thus, the interval between prime onset and target onset, commonly referred to as the stimulus onset asynchrony (SOA), was 300 ms. The target remained on the screen until the participant pressed a key. There was a 500 ms inter-stimulus interval.

It is important to note that a couple of procedural and temporal features were kept consistent throughout all the experiments. For example, the sequence of the fixation point, presentation of the prime followed by presentation of the target. Temporal details for presentation of the prime and onset of the target for each experiment did not change. Also, instructions given to the participants to pay attention to the prime were kept

consistent. Finally, instructions were given to categorize the target as quickly and accurate as possible. Practice and experimental trials were presented sequentially without interruptions within each experiment, but students were allowed to take a break between experiments.

Results

Mexican-American Bilingual Sample

Raw Scores and Baselines. Response times for experimental conditions are shown in Table 4. The total number of excluded trials was on average 9.65%. The baselines for this experiment were based on valence categorization in which participants categorized Spanish and English words of positive and negative valence on the basis of valence. Paired-samples t-tests were conducted to examine whether each experimental score differed from the corresponding baseline. When a negative target word was involved, all experimental conditions were significantly slower than baseline, $p < .03$. When a positive target word was involved, most experimental conditions were not significantly different from baseline, ps $> .05$. The exception was the condition in which an Anglo-American prime preceded a English positive target which was slower than the English positive baseline, $t(119) = 2.105$, $p = .037$.

Priming Scores. Priming scores were derived for each experimental condition by subtracting the baselines scores from the raw scores. Priming scores are shown in Table 5. There was no statistical difference between Mexican-American or Anglo-American primes, $F < 1$. There was no difference between positive or negative targets, $F(1, 119) = 2.46$, $MSE = 43{,}511$, $p = .119$. There was no difference between Spanish or English targets, $F < 1$. The interaction of interest between prime ethnicity and target valence,

which indicated implicit attitudes towards ethnicity was not statistically significant, $F < 1$. None of the other possible interactions were statistically significant, *p*s >.05.

Mexican-National Spanish-dominant Sample.

Raw Scores and Baselines. Response times for experimental conditions are shown in Table 4. The total number of excluded trials was on average 8.77%. The baselines for this experiment were based on positive or negative valence. As mentioned before, the targets were presented only in Spanish. Paired samples t-tests were conducted to examine whether the experimental scores differed from the baseline. The experimental condition in which a Mexican prime preceded a Spanish positive target was significantly slower than baseline, $t(35) = 2.218$, $p = .033$. All other comparisons were not statistically significant, *p*s > .05.

Priming and Interference scores. Priming and interference scores were derived for each experimental condition by subtracting the baseline scores from the raw scores. Priming and interference scores are shown in Table 5. There was no difference between Anglo-American and Mexican primes, $F < 1$. There was no difference between positive or negative targets, $F < 1$. Also, there was no interaction between prime ethnicity and target valence, which was the interaction of interest in this study, $p > .05$.

Anglo-American English-dominant Sample

Raw Scores and Baselines. Response times for experimental conditions are shown in Table 4. The total number of excluded trials was on average 13.57%. The baselines for this experiment were based on positive or negative valence. As mentioned before, the targets were presented only in English. Paired samples t-tests were conducted to examine

whether the experimental scores differed from the baseline. All experimental conditions were faster than baseline, $p < .05$.

Priming scores. Priming scores were derived for each experimental condition by subtracting the baselines scores from the raw scores. Priming scores are shown in Table 5. There was no difference between Anglo-American and Mexican primes, $F < 1$. There was no difference between positive or negative targets, $F < 1$.

There was a marginal interaction between prime ethnicity and target valence, $F(1,32) = 3.878$, $MSE = 9{,}880$, $p = .058$. This interaction is illustrated in Figure 3. For trials with Mexican primes there was numerically greater facilitation for negative targets than positive targets, but for Anglo-American primes, there was no difference between positive and negative targets. Also, Anglo-American primes ($M = -71$, $SD = 105$) produced greater facilitation than Mexican primes ($M = -47$, $SD = 113$) for positive targets, $t(32) = 2.72$, $p = .009$. However, there was no difference between Anglo-American and Mexican primes for negative targets, $t < 1$. Overall, these results suggest that there is a greater association for Anglo-American primes and positive target words than Mexican primes and positive target words. Therefore, there was a positivity bias towards Anglo-Americans. Thus, this may indicate a greater positive attitude towards Anglo-Americans compared to Mexicans.

Discussion

The primary question in Experiment 1 was whether the patterns of priming would indicate a positive attitude toward the in-group and/or a negative attitude toward the out-group. For the Mexican-American sample, there was not a significant interaction between the prime ethnicity and target valence. This may indicate that there is neither a

positive nor a negative attitude towards either Mexican-Americans or Anglo-Americans. In the same manner for the Mexican-National sample, there was not a significant interaction between the prime ethnicity and target valence. This may indicate that there is neither a positive nor a negative attitude towards either Mexicans or Anglo-Americans. In contrast for the Anglo-American sample, the interaction was marginally significant. Pairwise comparisons indicated that there is a greater association for Anglo-American primes and positive target words than Mexican primes and positive target words. This shows a greater positivity bias towards Anglo-Americans compared to Mexicans. Therefore, this may indicate a greater positive attitude towards Anglo-Americans compared to Mexicans.

EXPERIMENT 2:

THE EFFECT OF VALENCE ON ETHNICITY CATEGORIZATIONS

The primary question in Experiment 2 was whether participants would show a positive attitude toward the ethnic in-group and/or a negative attitude toward the ethnic out-group. This question was addressed by examining the evaluative priming effect that a positive or negative prime word would have on time needed to categorize the ethnicity of a target picture. A positive in-group attitude would be indicated by faster responses to same ethnicity target pictures following positive words than following negative words. A negative out-group attitude would be indicated by faster responses following negative words than following positive words to a target picture of a different ethnicity from the participants.

Method

The design was a 2 (prime valence: positive or negative) x 2 (prime language: English or Spanish) X 2 (target ethnicity: Anglo-American or Mexican-American) within subjects design. The dependent variable was response time for ethnicity categorization.

The stimulus materials and procedure for this experiment were identical to Experiment 1 with the exception that the order of presentation for the target and prime was reversed. The experimenter explained to participants that they would see a word appear in the middle of the screen. Then, they would see a photograph depicting either an Anglo-American or a Mexican-American. Participants' primary task was to categorize the target, in this case the photograph, as either Anglo-American or Mexican-American as quickly and accurately as possible. (For Spanish-speakers and English speakers, recall that "Mexican-American" was replaced with "Mexican".) Participants' secondary task

was to pay attention to the prime, in this case positive and negative words in both Spanish and English.

Results

Mexican-American Bilingual Sample

Raw Scores and Baselines. Response times for experimental conditions are shown in Table 6. The total number of excluded trials was on average 9.23%. The baselines for this experiment were based on ethnicity categorizations. Paired samples t-tests were conducted to examine whether the experimental scores differed from the baseline. The experimental condition in which an English negative prime was presented followed by a Mexican-American target was significantly slower than the Mexican-American baseline, $t(119) = 2.375$, $p = .019$. The experimental condition in which a Spanish positive prime was presented followed by an Anglo-American target was significantly slower than the Anglo-American baseline, $t(119) = 2.199$, $p = .03$. All other comparisons between the experimental conditions and the baseline were non-significant, ps $> .05$.

Interference Scores. Interference scores were derived for each experimental condition by subtracting the baselines scores from the raw scores. Interference scores are shown in Table 7. There was no difference between positive and negative primes, $F < 1$.There was no difference between English and Spanish primes, $F(1,119) = 2.077$, $MSE = 16,892$, $p = .152$. There was no difference between the categorization of Anglo-American and Mexican-American targets, $F < 1$.

There was an interaction between prime valence and target ethnicity, which was the interaction of interest in this study, $F(1,119) = 7.834$, $MSE = 62,646$, $p = .006$. This interaction is illustrated in Figure 4. Paired-samples t-tests showed that there was less

interference for Mexican-American targets when a positive prime (M = 17, SD =195) was presented compared to a negative prime (M = 36, SD = 194), $t(119) = 2.636$, $p = .009$. In contrast, there was less interference for Anglo-American targets when a negative prime (M = 22, SD = 216) was presented compared to a positive prime (M = 35, SD = 215); however this comparison was marginally significant, $t(119) = 1.828$, $p = .07$. This interaction indicates that Mexican-American targets are more associated with positive primes than negative primes. Also, Anglo-American targets are possibly more associated with negative primes than positive primes. This may indicate a positivity bias towards the ethnic in-group and possibly a negativity bias towards the out-group

There was also an interaction between prime language and target ethnicity, $F(1,119) = 8.689$, MSE = 37,613, $p = .004$. This interaction is illustrated in Figure 5. Paired-samples t-tests showed that there was less interference for Anglo-American targets when preceded by an English prime (M = 18, SD = 209) compared to a Spanish prime (M = 39, SD = 223), $t(119) = 2.591$, $p = .011$. In contrast, there was less interference for Mexican-American targets when preceded by a Spanish prime (M = 25, SD = 194) than an English prime (M = 29, SD = 192); however, this comparison was statistically unreliable, $p > .05$. No other interactions were statistically significant, ps > .05. This interaction indicated that English primes were more associated with Anglo-American targets compared to Mexican-American targets. In contrast, Spanish primes were possibly more associated with Mexican-American targets compared to Anglo-American targets. (This interaction was only possible for the bilingual sample given that the prime was presented in both Spanish and English.) This finding was not central in Experiment 1, but it is relevant in the context of Experiment 5 where it will be further discussed.

Mexican-National Spanish-dominant Sample.

Raw Scores and Baselines. Response times for experimental conditions are shown in Table 6. The total number of excluded trials was on average 8.77%. The baselines for this experiment were based on ethnicity categorizations as described for the Mexican-American sample. As mentioned before, the prime was presented only in Spanish. Paired samples t-tests were conducted to examine whether the experimental scores differed from the baseline. In the experimental condition in which a Spanish negative prime was followed by an Anglo-American target, classification was slower than for the Anglo-American baseline, $t(35) = 3.483$, $p = .001$. In the experimental condition in which a Spanish positive prime was followed by an Anglo-American target, classification was slower than for the Anglo-American baseline, $t(35) = 2.686$, $p = .011$. The other experimental conditions did not differ from baseline, $ps > .05$.

Interference scores. Interference scores were computed in the same manner as described for the Mexican-American sample. Interference scores are shown in Table 7. There was no difference between positive and negative primes, $F < 1$. There was less interference for Mexican targets than Anglo-American targets, $F(1,35) = 9.124$, $MSE =$ 16, 2745, $p = .005$.

There was a significant interaction between prime valence and target ethnicity, $F(1,35) = 7.884$, $MSE = 23{,}999$, $p = .008$. This interaction is illustrated in Figure 6. Paired-samples t-tests showed that there was less interference for Anglo-American targets when preceded by a positive prime ($M = 75$, $SD = 166$) than a negative prime ($M = 109$, $SD = 187$), $t(35) = 2.221$, $p = .033$. However, the valence of the prime did not have an effect on Mexican targets, $p = .267$. Also, when a negative prime was presented, Mexican

targets (*M* = 16, *SD* = 189) were classified faster than Anglo-American targets (*M* = 109, *SD* = 187), *t*(35) = 3.713, *p* =.001. However, the positive primes did not exhibit an effect of target ethnicity, *p* = .08. Overall, when the prime was negative there was less interference for Anglo-American targets compared to Mexican targets. Therefore, it may indicate that negative primes are more associated with Mexican targets than Anglo-American targets.

Anglo-American English-dominant Sample

Raw Scores and Baselines. Response times for experimental conditions are shown in Table 6. The total number of excluded trials was on average 8.13%. The baselines for this experiment were based on ethnicity categorizations as described for the Mexican-American sample. As mentioned before, the prime was presented only in English. Paired samples t-tests indicated that experimental conditions did not differ from baseline, *p*s > .05.

Priming and Interference scores. Priming and interference scores were computed in the same manner as described for the Mexican-American sample. Priming and interference scores are shown in Table 7. There was no difference between positive and negative primes, *F* < 1. Mexican targets showed numerically greater facilitation than Anglo-American targets, but this difference did not reach statistical significance, *F*(1,32) = 4.078, *MSE* = 217,965, *p* = .052. There was no interaction between prime valence and target ethnicity, *F* < 1.

Discussion

The primary question in Experiment 2 was whether the patterns of evaluative priming would be indicative of in-group positivity bias or out-group negativity bias. For the Mexican-Americans, the interaction indicates that Mexican-American targets are more associated with positive primes than negative primes. Also, Anglo-American targets are possibly more associated with negative primes than positive primes. This may indicate a positivity bias towards the in-group and possibly a negativity bias towards the out-group. Therefore, this may represent a positive attitude towards the in-group and a negative attitude towards the ethnic out-group. For the Mexican-Nationals, an interaction between prime valence and target ethnicity was found. When the prime was negative there was less interference for Anglo-American targets compared to Mexican targets. Therefore, it may indicate a negativity-bias against the in-group, thus indicating negative attitudes towards the in-group. For the Anglo-Americans, the interaction between prime valence and target ethnicity was not significant. In summary, Mexican-Americans showed positive attitudes towards the in-group and possibly negative attitudes towards the out-group. In contrast, Mexican-National showed negative attitudes towards the in-group.

EXPERIMENT 3:

THE EFFECT OF ETHNICITY ON LANGUAGE CATEGORIZATIONS

The primary question in Experiment 3 was whether participants would associate ethnicity and language. This question was addressed by examining the associative priming effect that the ethnicity of a prime picture would have on the time needed to categorize Spanish and English words. It was expected that Mexican photographs would be associated more with Spanish words than with English words, and Anglo-American photographs would be associated more with English words than with Spanish words. Therefore, the language categorization of Spanish target words was expected to be faster following a Mexican than an Anglo-American prime, and the language categorization of English target words was expected to be faster following an Anglo-American prime than a Mexican prime.

Method

The design was a 2 (prime ethnicity: Anglo-American or Mexican-American) x 2 (target language: Spanish or English) within subjects design. The target stimuli were of neutral valence. The dependent variable was the response time to categorize words on the basis of language.

The procedure and temporal details were the same as previously described in Experiment 1. In this experiment, participants carried out two tasks. The experimenter explained to participants that they would see a photograph depicting either an Anglo-American or a Mexican-American (or Mexican for the Anglo-American and the Mexican-National sample). Then, they would see a word. Participants' primary task was to categorize the target, in this case a word, as in either Spanish or English as quickly and

accurately as possible. Participants' secondary task was to pay attention to the prime, in this case a photograph. Before the start of the experiment, participants completed a practice phase consisting of 16 trials involving prime-target pairs as to familiarize them with the procedure. The experiment consisted of 48 prime-target pairs.

Results

Mexican-American Bilingual Sample

Raw Scores and Baselines. Response times for experimental conditions are shown in Table 8. The total number of excluded trials was on average 9.65%. The baselines for this experiment were based on language categorizations. Paired samples t-tests were conducted to examine whether the experimental scores differed from the baseline. All the experimental conditions were slower than baseline, $p < .01$.

Interference Scores. Priming scores were derived for each experimental condition by subtracting the baseline scores from the raw scores. Interference scores are shown in Table 9. There was no difference between Anglo-American and Mexican-American primes, $F < 1$. There was no difference between Spanish and English targets, $F(1,119) = 1.397$, $MSE = 13{,}399$, $p = .24$. There was no interaction between prime ethnicity and target language, $F < 1$.

Mexican-National Spanish-dominant Sample.

Raw Scores and Baselines. Response times for experimental conditions are shown in Table 8. The total number of excluded trials was on average 8.77%. The baselines for this experiment were based on language categorizations as described for the Mexican-American sample. Paired samples t-tests were conducted to examine whether the experimental scores differed from the baseline. The experimental condition in which an

Anglo-American prime preceded a Spanish word did not differ from baseline, $t(36) = 1.821$, $p = .077$. All other experimental conditions were slower than baseline, $p < .02$.

Interference Scores. Interference scores were computed in the same manner as described for the bilingual sample. Interference scores are shown in Table 9. There was no difference between Anglo-American and Mexican primes, $F < 1$. There was no difference between Spanish and English targets, $F < 1$. There was no interaction between prime ethnicity and target language, $F < 1$.

Anglo-American English-dominant Sample

Raw Scores and Baselines. Response times for experimental conditions are shown in Table 8. The total number of excluded trials was on average 12.08%. The baselines for this experiment were based on language categorizations as described for the bilingual sample. Paired samples t-tests indicated that experimental conditions did not differ from baseline, ps > .05

Interference Scores. Interference scores were computed in the same manner as described for the bilingual sample. Interference scores are shown in Table 9. There was no difference between Anglo-American and Mexican primes, $F(1,32) = 1.189$, $MSE = 5,960$, $p = .284$. There was no difference between Spanish and English targets, $F < 1$.

There was an interaction between prime ethnicity and target language, $F(1,32) = 17.743$, $MSE = 41, 730$, $p < .001$. This interaction is illustrated in Figure 7. Anglo-American primes ($M = - 3$, $SD = 99$) produced less interference than Mexican primes ($M = 46$, $SD = 159$) for English targets, $t(32) = 2.684$, $p = .011$. This indicates that Anglo-Americans are more associated with English than Mexicans. In contrast, Anglo-American primes produced more interference ($M = 22$, $SD = 114$) than Mexican primes $M = 0$, $SD =$

113), for Spanish targets, $t(32) = 2.079$, $p = .046$. This indicated that Mexicans are associated more with Spanish than English. Therefore, Anglo-American primes are associated with English targets and Mexican primes are associated with Spanish targets.

Discussion

Experiment 3 investigated the association between ethnicity and language. For the Mexican-American bilingual sample and the Mexican-National Spanish-dominant sample, the interaction between prime ethnicity and target language was not significant. However, for the Anglo-American English-speakers, Anglo-American primes were associated with English targets and Mexican primes were associated with Spanish targets. At least for the Anglo-American sample, priming ethnicity has an effect on language categorization.

EXPERIMENT 4:

THE EFFECT OF LANGUAGE ON ETHNICITY CATEGORIZATIONS

The primary question in Experiment 4 was whether participants would associate ethnicity and language. This question was addressed by examining the associative priming effect that Spanish and English primes would have on the time needed to categorize the ethnicity of a prime picture It was expected that Mexican pictures would be associated with Spanish words more than with English words, and Anglo-American pictures would be associated with English words more than with Spanish words. Therefore, the ethnicity categorization of Mexican target pictures was expected to be faster following Spanish prime words than following English prime words, and the ethnicity categorization of Anglo-American target pictures was expected to be faster following English prime words than following Spanish prime words.

Method

The design was a 2 (prime language: Spanish or English) X 2 (target ethnicity: Anglo-American or Mexican-American) within-subjects design. Prime words were of neutral valence. The dependent variable was response time for target ethnicity categorization.

The stimulus materials and procedure for this experiment were identical to Experiment 3 with the exception that the order of presentation for the target and prime were reversed. The experimenter explained to participants that they would see a word in either Spanish or English. Then, they would see a photograph depicting either an Anglo-American or a Mexican-American (or Mexican for the Anglo-American and the Mexican-National sample). Participants' primary task was to categorize the picture as

either Anglo-American or Mexican-American as quickly and accurately as possible. Participants' secondary task was to pay attention to the word.

Results

Mexican-American Bilingual Sample

Raw Scores and Baselines. Response times for experimental conditions are shown in Table 10. The total number of excluded trials was on average 9.52%. The baselines for this experiment were based on ethnicity categorizations. Paired samples t-tests were conducted to examine whether the experimental scores differed from the baseline. None of the experimental conditions significantly differed from the corresponding baseline, *p*s >.05.

Interference Scores. Interferences scores were derived for each experimental condition by subtracting the baselines scores from the raw scores. Interference scores are shown in Table 11. There was no difference between Spanish and English primes, $F < 1$. There was no difference between Anglo-American and Mexican-American targets, $F < 1$.

There was an interaction between prime language and target ethnicity, $F(1,119) = 4.14$, $MSE = 34{,}172$, $p = .044$. This interaction is illustrated in Figure 8. There was significantly less interference when an Anglo-American target was preceded by an English prime ($M = 9$, $SD = 185$) than a Spanish prime ($M = 31$, $SD = 216$), $t(119) = 2.601$, $p = .01$. However, for Mexican-American targets, there was not a difference between English and Spanish primes, $p = .318$. The interaction indicates that Anglo-American targets are more associated with English primes compared to Spanish primes. However, Mexican-American targets are not strongly associated with either language. Therefore, Anglo-Americans are associated with the English language.

Mexican-National Spanish-dominant Sample.

Raw Scores and Baselines. Response times for experimental conditions are shown in Table 10. The total number of excluded trials was on average 9.29%. The baselines for this experiment were based on ethnicity categorizations as described for the bilingual sample. Paired samples t-tests were conducted to examine whether the experimental scores differed from baseline. None of the experimental conditions differed from baseline, *p*s > .05.

Priming and Interference Scores. Interferences scores were derived for each experimental condition by subtracting the baselines scores from the raw scores. Interference scores are shown in Table 11. There was no difference between English and Spanish primes, $F < 1$. There was a significant difference between Mexican and Anglo-American targets, $F(1,36) = 4.37$, $MSE = 68{,}121$, $p = .044$. There was facilitation for Mexican targets whereas for Anglo-American targets there was interference. Mexican targets produced priming scores whereas Anglo-American targets produced interference scores. There was no interaction between prime language and target ethnicity, $F < 1$.

Anglo-American English-dominant Sample

Raw Scores and Baselines. Response times for experimental conditions are shown in Table 10. The total number of excluded trials was on average 14.82%. The baselines for this experiment were based on ethnicity categorizations as described for the bilingual sample. Paired samples t-tests were conducted to examine whether the experimental scores differed from baseline. The experimental condition in which a Spanish prime preceded a Mexican target differed from baseline, $t(32) = 3.542$, $p = .001$. All other comparisons were no different from baseline, *p*s > .05.

Priming Scores. Priming scores were derived for each experimental condition by subtracting the baseline scores from the raw scores. Priming and interference scores are shown in Table 11. There was no difference between English and Spanish primes, $F < 1$. There was more facilitation for Mexican targets than Anglo-American targets, $F(1,32) = 6.238$, $MSE = 251{,}520$, $p = .018$.

There was an interaction between prime language and target ethnicity, $F(1,32) = 13.103$, $MSE = 50{,}037$, $p = .001$. This interaction is illustrated in Figure 9. English primes ($M = -27$, $SD = 173$) produced more facilitation than Spanish primes ($M = 3$, $SD = 163$) for Anglo-American targets, $t(32) = 2.447$, $p = .02$. In contrast, Spanish primes ($M = -123$, $SD = 200$) numerically produced more priming than English primes ($M = -75$, $SD = 235$) for Mexican targets, but the contrast was marginally significant, $t(32) = 2.005$, $p = .053$. Therefore, English primes facilitated the categorization of Anglo-American targets compared to Spanish primes. Although the comparison was marginally, Spanish primes facilitated the categorization of Mexican targets compared to Anglo-American targets. Therefore there was an association between English primes and Anglo-American targets possibly an association between Spanish primes and Mexican targets.

Discussion

Experiment 4 investigated the association between language and ethnicity. For the Mexican-American bilingual sample, the interaction between prime language and target ethnicity was significant. The interaction indicates that Anglo-American targets are more associated with English primes compared to Spanish primes. Therefore, Anglo-Americans were associated with English and this interaction was also present in Experiment 2. For the Mexican-Nationals Spanish-dominant sample, the interaction

between prime language and target ethnicity was not significant. For the Anglo-American English-dominant sample, English primes facilitated the categorization of Anglo-American targets compared to Spanish primes. Although the comparison was marginally significant, Spanish primes appeared to facilitate the categorization of Mexican targets compared to Anglo-American targets. Therefore there was an association between English and Anglo-Americans and possibly there is an association between Spanish and Mexicans.

EXPERIMENT 5:

THE EFFECT OF LANGUAGE ON VALENCE EVALUATIONS

The primary question in Experiment 5 was whether participants would show a positive attitude toward the in-group language and/or a negative attitude toward the out-group language. This question was addressed by examining the evaluative priming effect that the language prime (English or Spanish) would have on the time needed to categorize the valence of positive and negative words. A positive in-group attitude would be indicated by faster responses to positive words than negative words following the language spoken by the participant, and a negative out-group attitude would be indicated by faster responses to negative words than positive words following a language not spoken by the participant. For bilinguals, both languages were considered to be in-group languages.

Method

The design was a 2 (prime language: English or Spanish) x 2 (target valence: positive or negative) x 2 (target language: English or Spanish) within-subjects design. Prime words were of neutral valence. Targets were presented in both Spanish and English in order to control for prime and target language congruency, and avoid predictability of target language based on the prime. The dependent variable was the response time to categorize words on the basis of valence.

The experimenter explained to participants that two words would appear, one after the other. Participants' primary task was to categorize the second word as either in Spanish or English as quickly and accurately as possible. Participants' secondary task was to pay attention to the first word, in this case a positive or negative word in Spanish

or English. Before the start of the experiment, participants completed a practice phase consisting of 16 prime-target trials involving different words than those used in the experimental condition to familiarize them with the procedure. The experiment consisted of 64 prime-target pairs. There were 16 items in each of the experimental conditions. (For the English- and Spanish-dominant speakers, the experiment consisted of 16 practice trials and 48 experimental trials.)

Results

Mexican-American Bilingual Sample

Raw Scores and Baselines. Response times for experimental conditions are shown in Table 12. The total number of excluded trials was on average 9.5%. The baselines for this experiment were based on valence categorization in which participants categorized Spanish and English words of positive and negative valence on the basis of valence. Paired-samples t-tests were conducted to examine whether each experimental score differed from the baseline. The experimental condition where Spanish neutral primes preceded Spanish positive targets (M = 872, SD = 317) was significantly slower than baseline (M = 805, SD = 181), $t(119) = 2.806$, $p = .006$. There was not a statistical difference for the rest of the comparisons relative to baseline, ps < .05.

Interference Scores. Interference scores were derived for each experimental condition by subtracting the baselines scores from the raw scores. Interference scores are shown in Table 13. There was no difference between Spanish and English primes, $F < 1$. There was a statistical difference between positive and negative targets, $F(1, 119) = 7.808$, MSE = 281,912, $p = .006$. There was no difference between Spanish or English targets, $F < 1$. None of the interactions were statistically significant, ps > .05. A

subsequent repeated measures ANOVA was conducted including language dominance as a between subject factor, and language dominance had no main effect, nor did it interact with the other variables.

Mexican-National Spanish-dominant Sample.

Raw Scores and Baselines. Response times for experimental conditions are shown in Table 12. The total number of excluded trials was on average 7.59%. The baselines for this experiment were based on valence categorization as described for the bilingual sample. Paired samples t-tests were conducted to examine whether the experimental scores differed from the baseline. Each experimental condition was slower than its corresponding baseline, *p*s < .01.

Interference Scores. Interference scores were computed in the same manner as described for the bilingual sample. Interference scores are shown in Table 13. There was less interference for Spanish primes than English primes, $F(1,35) = 6.217$, $MSE = 98{,}073$, $p = .018$. There was less interference for negative targets than positive targets, $F(1,35) = 4.537$, $MSE = 32{,}280$, $p = .04$.

The interaction between prime language and target valence was significant, $F(1,35) = 6.114$, $MSE = 59{,}536$, $p = .018$. This interaction is illustrated in Figure 10. Paired samples t-tests were conducted to examine the nature of the interaction. There was less interference when a prime was presented in Spanish ($M = 118$, $SD = 175$) compared to English ($M = 188$, $SD = 245$) for positive targets, $t(35) = 2.985$, $p = .005$. However, language of the prime did not have an effect in negative targets, $p =. 584$. Another way to look at this interaction is to note that there was less interference when a prime was in English for negative targets ($M = 95$, $SD = 182$) compared to positive targets ($M = 188$,

SD = 175), $t(35) = 2.872$, $p = .007$. However, Spanish primes did have an effect on the valence of the target, $p = .554$. Therefore, there was a greater association of English primes with negative targets than positive targets. For Spanish-dominant speakers, have a negativity bias towards the out-group language.

Anglo-American English-dominant Sample

Raw Scores and Baselines. Response times for experimental conditions are shown in Table 12. The total number of excluded trials was on average 7.5%. The baselines for this experiment were based on valence categorization as described for the bilingual sample. Paired samples t-tests indicated that none of the experimental conditions were statistically different from each corresponding baseline, ps > .05.

Priming Scores. Priming scores were computed in the same manner as described for the bilingual sample. Priming scores are shown in Table 13. There were no differences between Spanish and English primes, $F < 1$. There was no difference between negative and positive targets, $F < 1$.

The interaction between prime language and target valence was significant, $F(1,32) = 6.415$, $MSE = 21{,}637$, $p = .016$. This interaction is illustrated in Figure 11. When a Spanish prime was presented, there was more facilitation for negative targets ($M = -54$, $SD = 249$) than for positive targets ($M = -7$, $SD = 144$). However, when an English prime was presented, there was no difference in facilitation for negative targets ($M = -25$, $SD = 164$) or positive targets ($M = -21$, $SD = 218$). Another way to look at this interaction is to note that Spanish primes ($M = -54$, $SD = 249$) produced more facilitation than English primes ($M = -21$, $SD = 218$) for negative targets. Also, English primes ($M = -25$, $SD = 164$) produced more facilitation than Spanish primes ($M = -6$, $SD = 144$) for

positive targets. The interaction was statistically significant, but the paired samples t-tests indicated that none of these pairwise comparisons were statistically significant, *p*s > .05. The greatest numerical comparison was for Spanish primes in which there was less interference for negative-target words than positive-target words. This may indicate that there is a greater association between Spanish primes and negative targets than Spanish primes and positive targets. For the English-dominant speakers, these results may be interpreted as negative attitudes towards Spanish.

Discussion

Experiment 5 investigated in-group language positivity bias and/or out-group language negativity bias. For the bilinguals, the interaction between prime language and target valence was not significant. However, one was not expected given that both Spanish and English are in-group languages. For the Spanish-dominant speakers, the interaction between prime language and target valence was significant. There was a greater association of English primes with negative targets than positive targets. Spanish-dominant speakers, this result may indicate a negativity bias towards the out-group language. For the English-dominant speakers, the interaction between prime language and target valence was significant. The greatest numerical comparison was for Spanish primes in which there was less interference for negative-target words than positive-target words. This may indicate that there is a greater association between Spanish primes and negative targets than Spanish primes and positive targets. For the English-dominant speakers, these results may be interpreted as a negative bias towards the out-group language.

EXPERIMENT 6:

THE EFFECT OF VALENCE ON LANGUAGE CATEGORIZATION

The primary question in Experiment 6 was whether participants would show a positive attitude toward the in-group language and/or a negative attitude toward the out-group language. This question was addressed by examining the evaluative priming effect that positive or negative words would have on the time needed to categorize English and Spanish words on the basis of language. A positive in-group attitude would be indicated by faster responses to positive words than negative words following a language spoken by the participant, and a negative out-group attitude would be indicated by faster responses to negative words than positive words following a language not spoken by the participant. For bilinguals, both languages were considered to be in-group languages.

Method

The design was a 2 (prime valence: positive or negative) x 2 (prime language: English or Spanish) x 2 (target language: English or Spanish) within-subjects design (see table 2). Target words were of neutral valence. The dependent variable was the response time to categorize words on the basis of language.

The stimulus materials and procedure for this experiment were identical to Experiment 5 with the exception that the order of presentation for the target and prime were reversed. The experimenter explained to participants that two words would appear, one after the other. Participants' primary task was to categorize the second word, in this case a word as either in Spanish or English, as quickly and accurately as possible. Participants' secondary task was to pay attention to the first word, in this case a positive or negative word.

Results

Mexican-American Bilingual Sample

Raw Scores and Baselines. Response times for experimental conditions are shown in Table 14. The total number of excluded trials was on average 8.8%. The baselines for this experiment were based on language categorization. Paired samples t-tests were conducted to examine whether the experimental scores differed from the baseline. All of the experimental conditions were slower than the baseline, $p < .001$.

Interference Scores. Interferences scores were derived for each experimental condition by subtracting the baselines scores from the raw scores. Interference scores are shown in Table 15. There was no difference between positive or negative primes, $F < 1$. There was no difference between Spanish and English primes, $F < 1$. There was no difference between Spanish and English targets, $F(1,119) = 2.434$, $MSE = 55{,}237$, $p = .121$. The interaction between prime valence and target language, which was the interaction of interest was not significant, $F(1,119) = 3.383$, $MSE = 30{,}443$, $p = .068$.

The interaction between prime language and target language was significant, $F(1,119) = 6.026$, $MSE = 47{,}517$, $p = .016$. This interaction is illustrated in Figure 12. As a general trend, when the language was incongruent from prime to target, there was less interference than when the languages were congruent. Spanish primes caused more interference for Spanish targets ($M = 118$, $SD = 202$) than for English targets ($M = 89$, $SD = 202$), $t(119) = 2.458$, $p = .015$. Other possible interactions were not statistically significant, ps $> .05$. A subsequent repeated measures ANOVA was conducted including language dominance as a between subject factor, and language dominance had no main effect, nor did it interact with the other variables.

Mexican-National and Spanish-dominant Sample

Raw Scores and Baselines. Response times for experimental conditions are shown in Table 14. The total number of excluded trials was on average 6.73%. The baselines for this experiment were based on language categorization as described for the bilingual sample. Paired samples t-tests were conducted to examine whether the experimental scores differed from the baseline. All of the experimental conditions were slower than the baseline, $p < .002$.

Interference Scores. Interference scores are shown in Table 15. Interferences scores were derived for each experimental condition by subtracting the baseline scores from the raw scores. There was no difference between positive and negative primes, $F < 1$. There was no difference between English and Spanish targets, $F(1,35) = 2.246$, $p = .143$. There was no interaction between the prime valence and target language, $F < 1$.

Anglo-American English-dominant Sample

Raw Scores and Baselines. Response times for experimental conditions are shown in Table 14. The total number of excluded trials was on average 10.11%. The baselines for this experiment were based on language categorization as described for the bilingual sample. Paired samples t-tests were conducted to examine whether the experimental scores differed from the baseline. Experimental conditions in which there was an English target were slower than baselines, $p < .02$. In contrast, experimental conditions in which there was a Spanish target did not differ from baseline, $p > .05$.

Interference Scores. Interferences scores were derived for each experimental condition by subtracting the baseline scores from the raw scores. Interference scores are shown in Table 15. There was more interference for negative primes than positive

primes, but the difference was only marginally significant, $F(1,32) = 3.767$, $MSE = 17,503$, $p = .061$. There was no difference between English and Spanish targets, $F < .01$. There was no interaction between prime valence and target language, $F(1,32) = 1.5$, $MSE = 2,988$, $p = .230$.

Discussion

Experiment 6 investigated in-group language positivity bias and/or out-group language negativity bias. The interaction as a function of prime valence and target language, which was the interaction of interest in this study, was not significant for any of the samples.

GENERAL DISCUSSION

The relationship that exists between ethnic groups and their associated languages has not been studied in the field of implicit attitudes. For this reason, this study extends the research model of ethnic attitudes to the study of language attitudes, and to investigate the implicit association between ethnicity and language. Therefore in six sequential priming studies, the directionality and the strength of associations among language, affective bias and ethnicity were examined (Figure 1). Experiments 1 and 2 investigated whether the patterns of priming would indicate a positive attitude toward the ethnic in-group and/or a negative attitude toward the ethnic out-group. Experiments 3 and 4 examined the association between language and ethnicity. Experiments 5 and 6 explored whether participants exhibited positive attitudes toward the language in-group and/or negative attitudes toward the language out-group. These six experiments were tested in three samples.

For the Anglo-Americans whose dominant language was English, significant implicit associations were found in Experiments 1, 3, 4 and 5 (see Figure 13a). Experiment 1 examined ethnic in-group positivity bias or out-group negativity bias. Although the interaction between ethnicity of the prime and valence of the target for Experiment 1 was marginally significant, pairwise comparisons indicated that there was a greater association for Anglo-American primes and positive target words than for Mexican primes and positive target words. This may indicate a greater positivity bias towards the in-group. Experiment 3 and 4 examined the association between ethnicity and language. In Experiment 3, Anglo-American primes were strongly associated with English targets than Spanish targets. Also, Mexican primes were more strongly

associated with Spanish targets than English targets. In experiment 4, Anglo-American targets were more associated with English primes than Spanish primes. Finally Experiment 5 examined language in-group positivity bias or out-group negativity bias. It was found that for Spanish primes there was less interference for negative-target words than positive-target words. This may indicate that there is a greater association between Spanish primes and negative targets than Spanish primes and positive targets. These results may indicate a negativity bias towards Spanish, the out-group language.

In summary, for the Anglo-American English-dominant sample, the interaction between ethnicity and valence was marginal but it may indicate in-group positivity bias. Also, there was an out-group negativity bias towards the out-group language. Finally, for this group performance reflected a strong implicit association between Anglo-Americans and English and an implicit association between Mexicans and Spanish. The most common bias measured in social cognition is ethnic in-group positivity bias, rather than out-group negativity bias (Brewer, 2001). Therefore, this finding replicated existing finding and supports the Social Identity Theory (SIT) that predict in-group positivity bias. Also there was out-group language negativity bias towards Spanish. As mentioned before, there is an implicit association between ethnicity and language, which may allow in future studies investigate the reciprocal effect that language attitudes may have on ethnic attitudes.

For the Mexican-Nationals Spanish-dominant sample, there was support for implicit associations in Experiments 2 and 5 (see Figure 13b). Experiment 2 examined ethnic in-group positivity bias or out-group negativity bias. It was found that when the prime was negative there was less interference for Anglo-American targets compared to

Mexican targets. Therefore, negative primes are more associated with Mexican targets than Anglo-American targets. Therefore, it may indicate a negativity-bias against the in-group. Experiment 5 examined language in-group positivity bias or out-group negativity bias. It was found that there was a greater association of English primes with negative targets than positive targets. This result may indicate a negativity bias towards English, the out-group language.

In summary, for the Mexican-Nationals Spanish-dominant sample results indicate a negativity-bias towards their own ethnic group but a negativity-bias against the out-group language English. No associations were found between ethnicity and language. For this sample, in-group positivity was expected but instead in-group negativity was found. It is important to note that participants from this sample are enrolled in a university situated in the US-Mexico border and Mexican-Nationals studying in this area may have different characteristics not found in other populations. This sample is made primarily of participants who are born and raised in Mexico, and they are enrolled in an American university while at the same time taking English-learning classes. Moreover, some of them live in Mexico, but cross the border to study in the U.S in a daily basis. It is possible that Mexican-Nationals in this sample may have a greater need to assimilate in the dominant culture, therefore showing a negativity-bias towards their own ethnic group. However, assimilation patterns were not measured but may be of interest in future studies.

Another important finding was that Mexican nationals had a language out-group negativity bias. This can be interpreted as a negative attitude towards English. Another possible interpretation is that these participants are in the process of acquiring a second-

language and it is possible that this requires more cognitive resources from them, therefore translating into a negativity bias towards English. It would beneficial to study in the future, how language attitudes change due to increased fluency. According to these findings, it is important to note that ethnic and language attitudes are two related but different constructs. As in this sample, there were positive attitudes towards the ethnic out-group yet negative attitudes towards the language out-group. Some acculturation measures rely heavily on language use and proficiency to estimate the degree to which minority groups accommodate the dominant culture. However, these results indicate that minority groups may have different attitudes towards the ethnic majority and the majority language. This provides further evidence of the importance of studying these ethnic and language attitude constructs separately.

For the Mexican-American bilingual sample, there was support for implicit associations in Experiment 2 and 4 (see Figure 13c). Experiment 2 examined ethnic in-group positivity bias or out-group negativity bias. For the Mexican-Americans, the interaction indicates that Mexican-American targets are more associated with positive primes than negative primes. This may indicate a positivity bias towards the in-group. Therefore, these results may represent a positive attitude towards the in-group. Experiment 4 examined the association between ethnicity and language. The results indicate that an English prime produced less interference for an Anglo-American target compared to a Spanish prime. The interaction indicates that Anglo-American targets are more associated with English primes compared to Spanish primes. Therefore, Anglo-Americans were associated with English and this interaction was also present in Experiment 2.

In summary, for the Mexican-American bilingual sample there was a positive attitude towards the in-group. This finding is consistent with previous research in which individuals may have a greater positivity bias towards the in-group and a negative attitude towards the out-group. Also, as expected, Anglo-Americans were associated with English. However, neither positive nor negative attitudes associated with Spanish or English were found. For the Spanish-English bilinguals both languages can be considered the in-group, so in a sense no meaningful differences were expected between the two. An important characteristic of this sample is that Spanish was learned before English, but participants were fluent in both languages. It would be important to examine in the future whether the degree of language fluency makes a difference or if the first-language possesses more affective associations.

Although no inferential comparisons are made between the three samples, important patterns emerge. Anglo-Americans and Mexican-Americans show in-group positivity bias whereas Mexican-Nationals show in-group negativity bias. Also, for the Spanish- and English-dominant samples there was an out-group negativity bias. Finally, there was an association between English and Anglo-American, and Spanish and Mexican, for the Anglo-American English-dominant sample. The association between English and Anglo-Americans was also present for the Mexican-American bilingual sample. These findings will be discussed in the framework of previous research.

Ethnic Attitudes

Ethnic attitudes were examined in Experiments 1 and 2. Experiment 1 replicated the methodology of the seminal study by Fazio, Jackson, Dunton, and Williams (1995) in which the authors measured the affective priming estimates of automatically activated

ethnic attitudes. In the study by Fazio and colleagues (1995), it was found that, relative to white faces, black faces facilitated responding to negative target words and inhibited responding to positive target words. This result is consistent with other studies replicating the implicit negativity bias of Anglo-Americans individuals towards minority groups (for a review see, Greenwald, Poehlman, Uhlmann & Banaji, 2009; Blair, 2001). Although the study of Anglo-Americans attitudes towards Hispanics in particular is limited, there is evidence from other methodologies that Anglo-Americans may have a negativity bias towards Hispanics (Ottaway et al., 2001; Uhlmann et al., 2002; Dovidio, Gaertner, Anastasio, & Sanitioso, 1992; Weyant, 2005). As previously discussed, positivity bias towards the in-group predominates more than negativity bias towards the out-group. The lack of positivity bias towards the out-group is considered to be a form of subtle racism rather than strong negative bias towards the out-group (Hewstone, Rubin & Willis, 2002). Despite this claim, in-group positivity bias may be related to out-group negativity bias, but they should be considered different constructs. An individual may have a greater positivity bias towards the in-group than the out-group, but this may not necessarily be a measure of implicit prejudice. As mentioned before, Anglo-Americans demonstrate a strong implicit positivity bias towards the in-group and a relative negativity bias towards the out-group. Although the interaction for Experiment 1 was marginally significant, pairwise comparisons indicated that there was a greater association for Anglo-American primes and positive-target words than Mexican primes and positive-target words. Therefore, the finding of Experiment 1 is consistent with previous research in which Anglo-Americans show positivity bias towards the in-group.

Experiment 1 also tested for the first time whether bilingual Mexican-Americans and Spanish-speaking Mexican-National participants would show in-group positivity or out-group negativity. As it turned out, these two samples neither out-group negativity nor in-group positivity effects in Experiment 1. However, in Experiment 2, which involved using positive and negative words to prime Anglo-Americans and Mexican target photographs, Mexican-Americans bilinguals showed both ethnic in-group positivity bias. Anglo-Americans' attitude towards Mexicans has been studied before, but the study of Mexican's attitudes towards Anglo-Americans is limited. Despite this, these results are consistent with the predictions of the Social Identity Theory (SIT) for individuals' tendency toward in-group positivity bias and out-group negativity bias.

Despite these results observed for Anglo-Americans and Mexican-Americans, Experiment 2 also demonstrates that individuals of disadvantaged groups may not always favor their in-group. Specifically, in the current experiment, Mexican-Nationals showed positivity bias towards the out-group. Out-group favoritism may occur in the context of power and status disadvantages for the minority group. According to the SIT, individuals would favor the in-group relative to the out-group, if individuals' group membership were a source for self-esteem. However, if identification with the group membership does not enhance self-esteem, then the individual may be less likely to identify with the group. Moreover, according to the Social Justification Theory (SJT), an individual may seek to preserve existing social hierarchies by adopting the mainstream culture's imposition of unequal power and status structures. Therefore, for minority groups, out-group positivity bias may be a result of less identification with the in-group and/or identification with the beliefs and values of the majority group. As a consequence, individuals of disadvantaged

groups may show out-group positivity bias. However, current research has not examined under what conditions out-group positivity bias may be present for Mexican individuals.

Previous research has found that African-Americans have favored Anglo-Americans over their own group (Ashburn-Nardo, voils & Monteith et al., 2003). Livingston (2002) found that the more negativity African-Americans perceived in the mainstream culture's construal of the their in-group, the less in-group positivity bias they exhibited at an implicit level, but the more in-group positivity bias they exhibited at the explicit level. Therefore, it may debated that out-group positivity bias (or even in-group negativity bias) may be a result of knowledge of unequal status and not necessarily its endorsement. The same argument may be applied to our finding in which Mexican-Nationals favor the out-group. Mexican-Nationals may be aware of the negative associations in the mainstream culture. Regardless of the source of implicit attitudes as individual's personal evaluation of the in-group, or knowledge negative views by the mainstream culture, out-group positivity bias held by members of disadvantaged groups may negatively affect their behavior toward their in-group members.

Language Attitudes

For the first time, Experiments 5 and 6 examined implicit language attitudes among Spanish-English bilinguals, Spanish speakers and English speakers. The paradigm developed by Fazio and colleagues (1995) to evaluate implicit ethnic attitudes was adapted to investigate implicit language attitudes. Specifically, a Spanish or English prime of neutral valence was used to activate the language category, which was followed by a valenced target in both Spanish and English. The neutral prime word was used to activate the language category whereas the target was used to activate positive or

negative evaluations of the prime. In Experiment 5, both Mexican-national Spanish speakers and Anglo-American English speakers showed language out-group negativity bias. As mentioned before, no languages biases were expected for bilingual participants, because both languages may be considered in-group languages. In Experiment 6, no effects were found for any of the samples.

Mexican-national Spanish-dominant speaking and Anglo-American English-dominant speaking participants demonstrated negativity bias towards their respective out-group languages. In the same manner as for ethnic attitudes, the results for language attitudes were consistent with the SIT. Therefore, if an individual derives self-esteem from the group-membership, in this case language membership, then individuals would be like to show positivity bias towards the in-group language or negativity bias towards the out-group language. As a consequence, language may be a source of identity which may also contribute to ethnic identity (Laroche, Pons & Ricchard, 2009).

Individuals may like or dislike languages based on different characteristics such as how valuable the language is perceived, how fluent they are in a specific language, how close a language is to their identity, or if speaking a certain language confers them with higher status. Regardless of the reasons why individuals may like one language over another, individuals may make judgments about people based on the particular language that they speak.

The Relationship between Ethnicity and Language

The current study examined for the first time the implicit association between ethnicity and language categories. In Experiment 3, for the Anglo-American English-speakers sample, Anglo-American primes were associated with English targets and

Mexican primes were associated with Spanish targets. In Experiment 4, for both the Mexican-American bilinguals and the Anglo-American sample, English primes were associated with Anglo-Americans targets. This effect was replicated in Experiment 2 for the bilingual sample. For the Anglo-Americans sample, Spanish primes were associated with Mexican targets.

Despite its apparent simplicity, the association between ethnicity and language may have an important role in ethnic attitudes. For example, Edwards (1982) mentions that speakers of regional patterns, minority groups, and lower-class populations (often apply to the same group) evoke unfavorable reactions in terms of status and prestige. Speech samples may evoke stereotypes of the speaker's group. For example, accent may serve as a speech cue to make judgments of socioeconomic status. Brennan and Brennan (1981) found that Mexican-Americans were given lower status ratings as their degree of accent increased. If there is an association between language cues and stereotypic information, it is important to find how this relationship is activated. It is possible that language itself is part of the stereotypic information. Therefore, language may be used as a cue for stereotype activation or as a proxy for ethnic attitudes in particular towards Hispanics who belong to both language and ethnic minorities.

Evaluative and Associative Priming

The premise of evaluative priming is that one may measure the attitude towards the prime stimulus by examining how the presence of the prime influences the speed of evaluative categorization of the target stimulus. Evaluative priming effects are obtained when the participant is required to categorize targets on the basis of valence, but the effect does not replicate when the targets are categorized on the basis of non-evaluative

stimulus features (Klinger, Burton, and Pitts, 2000; De Houwer, Hermans, Rothermund, & Wentura, 2002; Klauer and Musch, 2002; Spruyt, Hermans, De Houwer, & Eelen, 2003). Despite this evidence, Spruyt, De Houwer, Hermans and Eelen (2007) found evaluative priming when participants allocated attention to the evaluative features of the stimuli. In this study, Experiment 2 and Experiment 6 examined evaluative priming.

In Experiment 2, this effect was replicated for the first time with social stimuli, in that evaluative priming occurred when participants made ethnicity decisions following valenced prime words. Despite some methodological differences, these results support previous research by Spruyts and colleges (2007) in which evaluative priming occurred in a non-evaluative task. In the current experiment, participants were not explicitly told to pay attention to the evaluative component of the prime, but they were aware of it. Participants were asked to classify the valence of words in the beginning of the experiment, which made this component salient. In contrast, Spruyts and colleagues (2007) explicitly instructed participants to pay attention to the evaluative stimulus features, which they consider crucial for obtaining evaluative priming in a non-evaluative categorization task. Another difference between the current experiment and Spruyts and colleagues was the type of stimuli used. In the current experiment, the nature of the evaluative task was social, in which photographs of Mexicans and Anglo-Americans was used and positive and negative words. In contrast, Spruyts and colleagues (2007) stimuli consisted of positive and negative pictures of objects and animals.

Therefore, despite methodological differences between the current experiment and previous research, evaluative priming was found in a non-evaluative task.

However, there is the possibility of other explanations for finding evaluative priming in Experiment 1. First, there was the possibility of carry-over effects in this study that could have highlighted the valence of the prime in Experiment 2. As mentioned before, baselines and experiments were blocked by target categorization and counterbalanced. For example, valence categorization baseline preceded Experiment 1 and 5. Therefore, participants had to categorize the target on the basis of valence in 3 different sessions. Then, in two of the possible counterbalancing orders, the ethnicity categorization baseline preceded Experiments 2 and 4. In Experiment 2 for example, the prime was a valenced word followed by an ethnicity target. Therefore, given the previous experience with valence categorization, the valence of the prime may have been highlighted for Experiment 2. So at least in two of the three possible orders, the valence of the prime was highlighted for Experiment 2.

Experiment 6 was one of the experimental designs in which evaluative priming was expected in a non-evaluative task. This is experiment is novel in two basic forms. First, the prime (a valence word) and the target (a neutral word) are both words. Second, the target is classified on the basis of a language category. Therefore, evaluative priming was expected in a non-evaluative task. Research conducted by Spruyt, Hermans, De Houwer and Eelen (2002) indicate that evaluative priming can be obtained when picture are used as primes but not when words are used as primes. Spruyt and collegues (2002) argue that semantic processing of pictures is more effective than semantic processing of words and that pictures are more effective as primes and more susceptible to priming as targets. Although the authors are cautionary with the interpretation of their results, there appears to be a qualitative difference between words and pictures in evaluative priming.

Mechanisms Involved in Priming

Another important finding in Experiment 2 is that associative priming between ethnicity and language was found. In the bilingual sample, English words were more strongly associated with Anglo-Americans than Spanish words. Therefore, simultaneous associative and evaluative priming occurred in a non-evaluative task. Associative (or semantic) and evaluative (or affective) priming are usually described in the literature as "either/or" priming mechanisms. As mentioned before, these results indicate that both mechanisms may operate simultaneously.

These results add to the current debate in the field as to whether concepts are organized by semantic or affective relatedness. It is possible that concepts are organized not by two independent nodes, one for semantic features and for affective features, but by two overlapping nodes or sets of nodes. It is possible that the degree of relatedness between the semantic and affective features may vary. Therefore, both associative and evaluative priming may be found when these two concepts are highly related.

Broader Implications

One of the important drives for the study of implicit of attitudes is to explore how they impact behavior. As mentioned before, implicit attitudes have an impact on behavior, but they not determine it. The study of ethnic and language attitudes may allow better understanding of the factors that may be involved in ethnic and language prejudice. For this reason, this study seeks to investigate whether implicit language attitudes could be measured and whether there is an association between language and ethnicity. The study of the interplay between implicit ethnic and language attitudes may the

understanding how these attitudes have an impact on public policies such as bilingual education, second-language acquisition and official-English laws.

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APPENDIX A

Word Stimuli

Neutral		Negative		Positive	
English	Spanish	English	Spanish	English	Spanish
elbow	codo	fear	temor	home	hogar
pencil	lápiz	crash	choque	wish	deseo
clock	reloj	thief	ladrón	song	canción
table	mesa	tomb	tumba	heaven	cielo
chair	silla	death	muerte	love	amor
city	ciudad	debt	deuda	kiss	beso
door	puerta	fever	fiebre	party	fiesta
earth	tierra	weapon	arma	mother	madre
farm	granja	grief	pena	beach	playa
name	nombre	jail	cárcel	health	salud
street	calle	lice	piojos	truth	verdad
tower	torre	pain	dolor	travel	viajes

APPENDIX B
Language Background Questionnaire

	English-Spanish Bilingual	Spanish-dominant	English-dominant
At what age did you begin to learn English?	5.48 (2.91)	10.42 (4.423)	1.80 (2.98)
At what age did you begin to learn Spanish?	1.32 (1.48)	0.92 (0.97)	11.24* (4.5)
Over the past month, what percentage of the time have you spoken			
English?	44.7 (18.77)	30.64 (13.88)	97.94 (4.71)
Spanish?	39.85 (17.84)	59.92 (18.72)	1.80 (4.56)
Mixture?	15.08 (23.07)	9.08 (17.73)	0.20 (0.87)
Other?	0.37 (1.82)	0.36 (1.52)	0.06 (0.236)
What language are you more skilled in for			
a. speaking?	4.18 (1.30)	6.08 (1.38)	1.17 (1.01)
b. listening comprehension?	3.99 (0.89)	5.00 (1.53)	1.26 (1.12)
c. reading?	3.54 (1.11)	4.47 (1.30)	1.37 (1.22)
d. writing?	3.18 (1.24)	4.58 1.50	1.31 (1.16)
e. pronunciation/accent?	4.21 (1.41)	5.47 (1.13)	1.37 (1.22)
f. spelling?	3.39 (1.30)	4.47 (1.75)	1.49 (1.27)
In which language do you have the largest vocabulary?	3.67 (1.62)	6.11 (1.14)	1.17 (1.01)
In which do you make fewer grammatical errors?	3.24 (1.57)	4.39 (2.07)	1.17 (1.01)

* Only 21 participants reported learning Spanish as a second language.

APPENDIX C

Summary of Results of Main Effects and Interactions for significant and non-significant results.

Summary of Results		BILINGUALS	SPANISH	ENGLISH
EXP 1	Prime Ethnicity	*NS*	*NS*	*NS*
	Target Language	*NS*	*X*	*X*
	Target Valence	*NS*	*NS*	*NS*
	Prime Ethnicity X Target Valence	*NS*	*NS*	***p = .058***
				Figure 3
EXP 2	Prime Valence	*NS*	*NS*	*NS*
	Prime Language	*NS*	*X*	*X*
	Target Ethncity	*NS*	S	S
	Prime Valence X Target Ethnicity	**S**	**S**	*NS*
		Figure 4	**Figure 6**	
	Prime Language X Target Ethnicity	**S**	*X*	*X*
		Figure 5		
EXP3	Prime Ethncity	*NS*	*NS*	*NS*
	Target Language	*NS*	*NS*	*NS*
	Prime Ethnicity X Target Language	*NS*	*NS*	**S**
				Figure 7
EXP4	Prime Language	*NS*	*NS*	*NS*
	Target Ethnicity	*NS*	S	S
	Prime Language X Target Ethnicity	**S**	*NS*	**S**
		Figure 8		**Figure 9**
EXP 5	Prime Language	*NS*	**S**	*NS*
	Target Language	*NS*	*X*	*X*
	Target Valence	S	S	*NS*
	Prime Language X Target Valence	*NS*	**S**	**S**
			Figure 10	**Figure 11**
EXP6	Prime Valence	*NS*	*NS*	*NS*
	Prime Language	*NS*	*X*	*X*
	Target Language	*NS*	*NS*	*NS*
	Prime Valence X Target Language	*NS*	*NS*	*NS*
	Prime Language X Target Language	**S**		
		Figure 12		

Table 1.

Valence-Decision Response Time Means (SDs) as a Function of Language and Target Valence for Baseline Conditions in Experiment 1 and 5.

Language	English	Spanish	English	Spanish
Target Valence	Negative	Negative	Positive	Positive
Bilinguals	810	857[a***]	808	805[a***]
	(147)	(168)	(170)	(181)
Spanish-dominant	779[b**]		742[b**]	
	(126)		(136)	
English-dominant	798		761	
	(243)		(161)	

Note: * $p < .05$, two-tailed, ** $p < .01$, two-tailed, *** $p < .001$, two-tailed

Table 2.

Ethnicity-Decision Response Time Means (SDs) for Baseline Conditions in Experiment 3 and 6.

Ethnicity	Mexican-American	Anglo-American
Bilinguals	683	669
	(146)	(154)
Spanish-dominant	726 [a***]	655 [a***]
	(232)	(201)
English-dominant	801 [b**]	676 [b**]
	(264)	(165)

Note: * $p < .05$, two-tailed, ** $p < .01$, two-tailed, *** $p < .001$, two-tailed

Table 3.

Language-Decision Response Time Means (SDs) for Baseline Conditions in Experiment 2 and 4.

Language	English	Spanish
Bilinguals	724	739
	(141)	(156)
Spanish-dominant	704 [a**]	735 [a**]
	(134)	(145)
English-dominant	635 [b**]	669 [b**]
	(112)	(117)

Note: * $p < .05$, two-tailed, ** $p < .01$, two-tailed, *** $p < .001$, two-tailed

Table 4.

Valence-Decision Response Time Means (SDs) as a Function of Prime Ethnicity, Target Language and Target Valence in Experiment 1.

Prime Ethnicity	Mexican-American	Anglo-American	Mexican-American	Anglo-American	Mexican-American	Anglo-American	Mexican-American	Anglo-American
Target Valence	Negative	Negative	Positive	Positive	Negative	Negative	Positive	Positive
Target Language	English	English	English	English	Spanish	Spanish	Spanish	Spanish
Bilinguals	783 (206)	778 (177)	780 (188)	777 (196)	813 (208)	809 (196)	789 (196)	781 (220)
Spanish-dominant					798 (150)	811 (183)	796 (165)	771 (144)
English-dominant	713 (162)	724 (157)	714 (144)	690 (115)				

Table 5.

Valence-Decision Priming and Interference Means (SDs) as a Function of Prime Ethnicity, Target Language and Target Valence in Experiment 1.

Prime Ethnicity	Mexican-American	Anglo-American	Mexican-American	Anglo-American	Mexican-American	Anglo-American	Mexican-American	Anglo-American
Target Valence	Negative	Negative	Positive	Positive	Negative	Negative	Positive	Positive
Target Language	English	English	English	English	Spanish	Spanish	Spanish	Spanish
Bilinguals	- 28	- 32	- 28	- 30	- 44	- 48	- 16	- 23
	(142)	(126)	(162)	(159)	(173)	(155)	(148)	(163)
Spanish-dominant					19	32	54	28
					(127)	(157)	(146)	(176)
English-dominant	- 85	- 75	- 47 [b**]	- 71 [b**]				
	(189)	(198)	(113)	(105)				

Note. Positive values indicate interference and negative values indicate priming.
* $p < .05$, two-tailed, ** $p < .01$, two-tailed, *** $p < .001$, two-tailed

Table 6.

Ethnicity-Decision Response Time Means (SDs) as a Function of Prime Language, Prime Valence, and Target Ethnicity in Experiment 2.

Prime Language	English	English	Spanish	Spanish	English	English	Spanish	Spanish
Prime Valence	Negative	Positive	Negative	Positive	Negative	Positive	Negative	Positive
Target Ethnicity	Mexican-American	Mexican-American	Mexican-American	Mexican-American	Anglo-American	Anglo-American	Anglo-American	Anglo-American
Bilinguals	726 (205)	697 (213)	712 (206)	703 (201)	679 (186)	696 (204)	703 (237)	713 (206)
Spanish-dominant			741 (277)	759 (249)			764 (308)	729 (276)
English-dominant	722 (207)	714 (166)			674 (237)	669 (228)		

Table 7.

Ethnicity-Decision Interference Means (SDs) as a Function of Prime Language, Prime Valence, and Target Ethnicity in Experiment 2.

Prime Language	English	English	English	English	Spanish	Spanish	Spanish	Spanish
Prime Valence	Negative	Negative	Positive	Positive	Negative	Negative	Positive	Positive
Target Ethnicity	Mexican-American	Mexican-American	Mexican-American	Mexican-American	Anglo-American	Anglo-American	Anglo-American	Anglo-American
Bilinguals	43 (200)	10 (205)	14 (203)	26 (224)	29 (197)	34 (241)	20 (202)	44 (218)
Spanish-dominant					16 (189)	109 (187)	33 (166)	75 (166)
English-dominant	-77 (336)	4 (311)	-85 (311)	-1 (301)				

Note. Positive values indicate interference and negative values indicate priming.

Table 8.

Language-Decision Response Time Means (SDs) as a Function of Prime Ethnicity and Target language in Experiment 3.

Prime Ethnicity	Mexican-American	Anglo-American	Mexican-American	Anglo-American
Target Language	English	English	Spanish	Spanish
Bilinguals	761	773	792	791
	(158)	(163)	(175)	(197)
Spanish-dominant	763	756	798	784
	(164)	(119)	(146)	(135)
English-dominant	682	633	669	691
	(171)	(109)	(137)	(123)

Table 9.

Language-Decision Interference Means (SDs) as a Function of Prime Ethnicity and Target Language in Experiment 3.

Prime Ethnicity	Mexican-American	Anglo-American	Mexican-American	Anglo-American
Target Language	English	English	Spanish	Spanish
Bilinguals	37	48	54	53
	(161)	(165)	(159)	(181)
Spanish-dominant	59	51	63	49
	(139)	(104)	(148)	(160)
English-dominant	46 [a*]	-3 [a*]	0 [b*]	22 [b*]
	(159)	(99)	(113)	(114)

Note. Positive values indicate interference and negative values indicate priming.
* $p < .05$, two-tailed, ** $p < .01$, two-tailed, *** $p < .001$, two-tailed

Table 10.

Ethnicity-Decision Response Time Means (SDs) as a Function of Prime Language and Target Ethnicity in Experiment 4.

Prime Language	English	Spanish	English	Spanish
Target Ethnicity	Mexican-American	Mexican-American	Anglo-American	Anglo-American
Bilinguals	714	701	678	699
	(232)	(232)	(194)	(240)
Spanish-dominant	722	713	688	694
	(185)	(166)	(167)	(182)
English-dominant	726	678	649	679
	(184)	(127)	(151)	(147)

Table 11.

Ethnicity-Decision Priming and Interference Means (SDs) as a Function of Prime Language and Target Ethnicity in Experiment 4.

Prime Language	English	Spanish	English	Spanish
Target Ethnicity	Mexican-American	Mexican-American	Anglo-American	Anglo-American
Bilinguals	31	19	9	30
	(200)	(213)	(185)	(216)
Spanish-dominant	- 3	-12	33	39
	(223)	(186)	(157)	(153)
English-dominant	- 74 [a*]	- 123 [a*]	- 27	3
	(235)	(200)	(173)	(163)

Note. Positive values indicate interference and negative values indicate priming.
* $p < .05$, two-tailed, ** $p < .01$, two-tailed, *** $p < .001$, two-tailed

Table 12.

Valence-Decision Response Time Means (SDs) as a Function of Prime Language, Target Language, and Target Valence in Experiment 5.

Prime Language	English	Spanish	English	Spanish	English	Spanish	English	Spanish
Target Language	English	English	Spanish	Spanish	English	English	Spanish	Spanish
Target Valence	Negative	Negative	Negative	Negative	Positive	Positive	Positive	Positive
Bilinguals	834	823	859	874	848	844	852	872
	(268)	(247)	(285)	(249)	(288)	(310)	(306)	(317)
Spanish-dominant			875	886			930	860
			(214)	(248)			(300)	(221)
English-dominant	777	744			737	755		
	(170)	(154)			(184)	(151)		

Table 13.

Valence-Decision Interference Means (SDs) as a Function of Prime Language, Target Language, and Target Valence in Experiment 5.

Prime Language	English	Spanish	English	Spanish	English	Spanish	English	Spanish
Target Language	English	English	Spanish	Spanish	English	English	Spanish	Spanish
Target Valence	Negative	Negative	Negative	Negative	Positive	Positive	Positive	Positive
Bilinguals	23	12	2	17	40	36	47	67
	(230)	(208)	(248)	(206)	(239)	(239)	(237)	(262)
Spanish-dominant			95 [b*]	106			188 [a*,b*]	118 [a*]
			(182)	(204)			(245)	(175)
English-dominant	- 21	- 54			-25	-7		
	(218)	(249)			(164)	(144)		

Note. Positive values indicate interference and negative values indicate priming.
* $p < .05$, two-tailed, ** $p < .01$, two-tailed, *** $p < .001$, two-tailed

Table 14.

Language-Decision Response Time Means (SDs) as a Function of Prime Language, Prime Valence, and Target Language in Experiment 6.

Prime Language	English	English	Spanish	Spanish	English	English	Spanish	Spanish
Prime Valence	Negative	Positive	Negative	Positive	Negative	Positive	Negative	Positive
Target Language	English	English	English	English	Spanish	Spanish	Spanish	Spanish
Bilinguals	815	826	809	818	840	832	865	848
	(216)	(225)	(233)	(207)	(233)	(213)	(250)	(228)
Spanish-dominant			818	822			885	862
			(212)	(227)			(254)	(224)
English-dominant	698	665			710	697		
	(171)	(121)			(149)	(144)		

Table 15.

Language-Decision Interference Means (SDs) as a Function of Prime Language, Prime Valence, and Target Language in Experiment 6.

Prime Language	English	English	Spanish	Spanish	English	English	Spanish	Spanish
Prime Valence	Negative	Positive	Negative	Positive	Negative	Positive	Negative	Positive
Target Language	English	English	English	English	Spanish	Spanish	Spanish	Spanish
Bilinguals	91	101	84	93	101	93	127	109
	(210)	(207)	(226)	(201)	(196)	(187)	(232)	(191)
Spanish-dominant			113	117			147	127
			(188)	(208)			(229)	(212)
English-dominant	62	30			41	28		
	(135)	(71)			(119)	(84)		

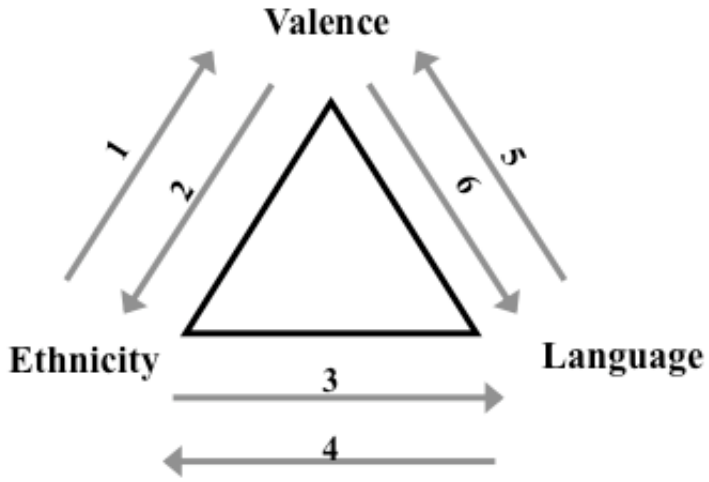


Figure 1. The six priming experiments proposed to examine the directional relation among language, language bias and ethnicity.

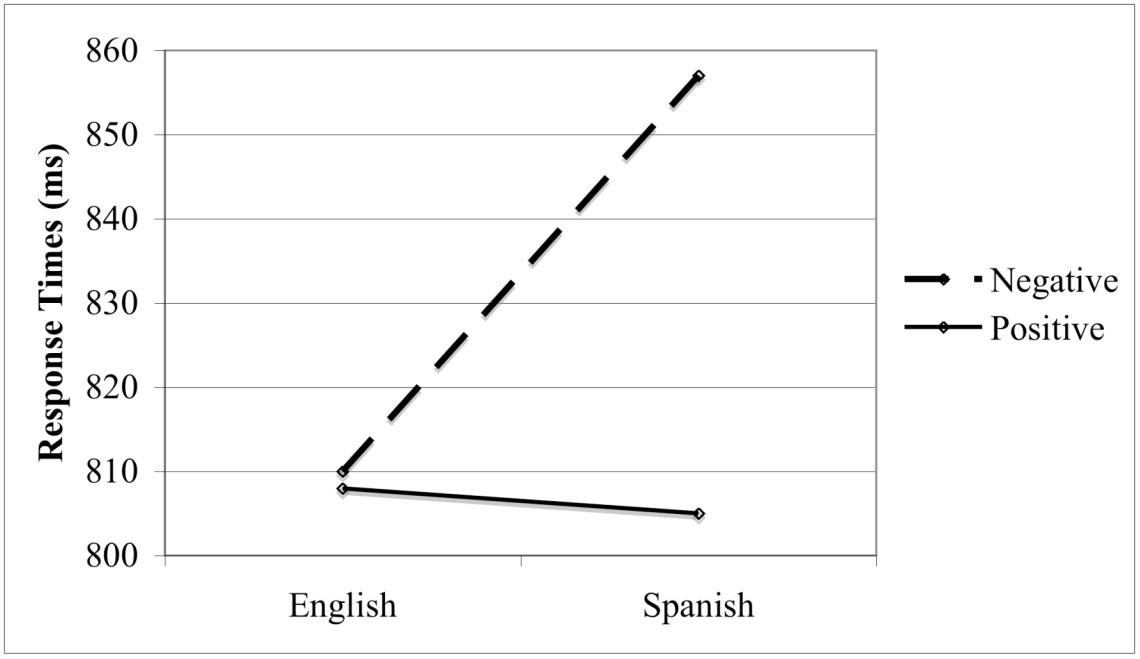


Figure 2. Interaction as a Function between Language and Valence for bilinguals baselines.

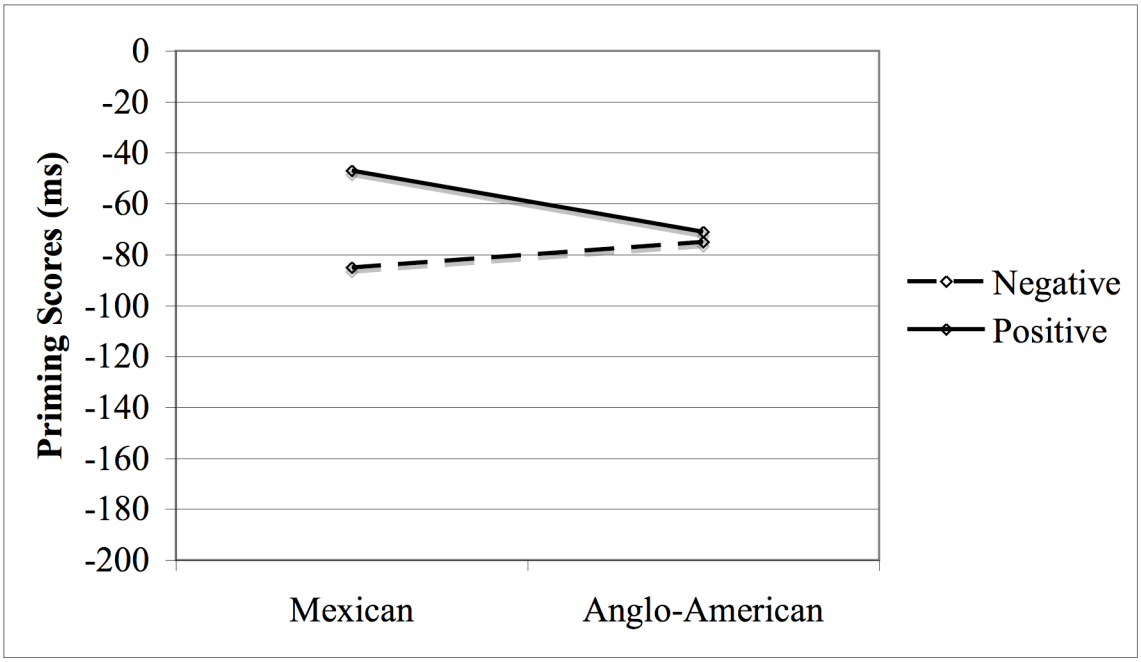


Figure 3. Priming as a Function of Prime Ethnicity and Target Valence for Anglo-Americans in Experiment 1.

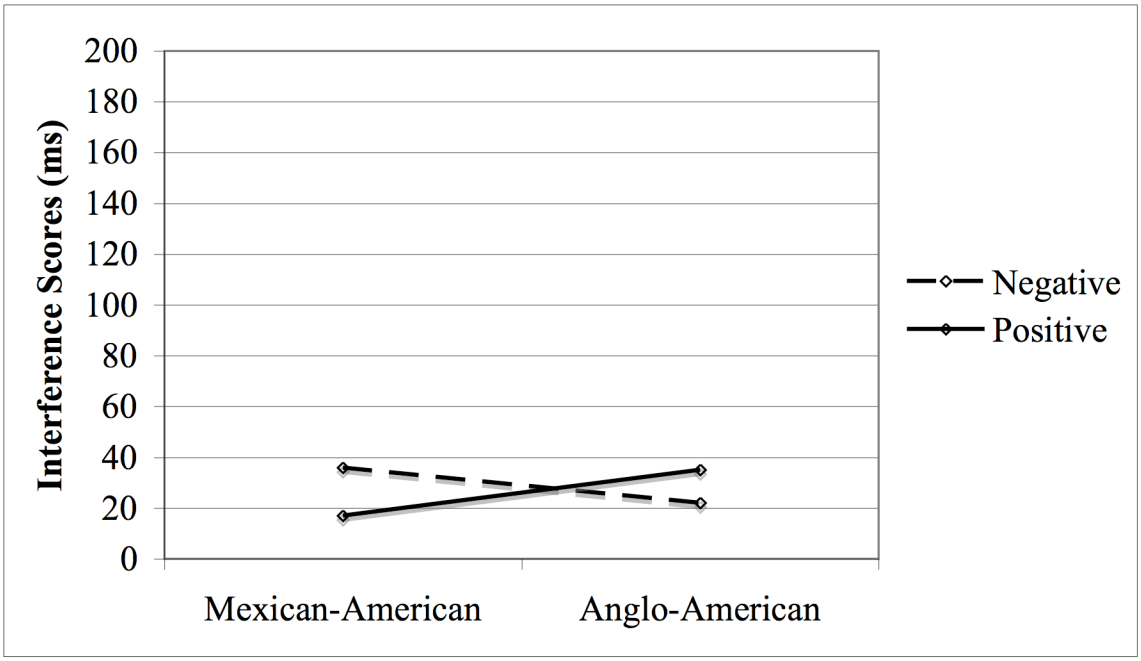


Figure 4. Interference as a Function of Prime Valence and Target Ethnicity for Mexican-Americans in Experiment 2.

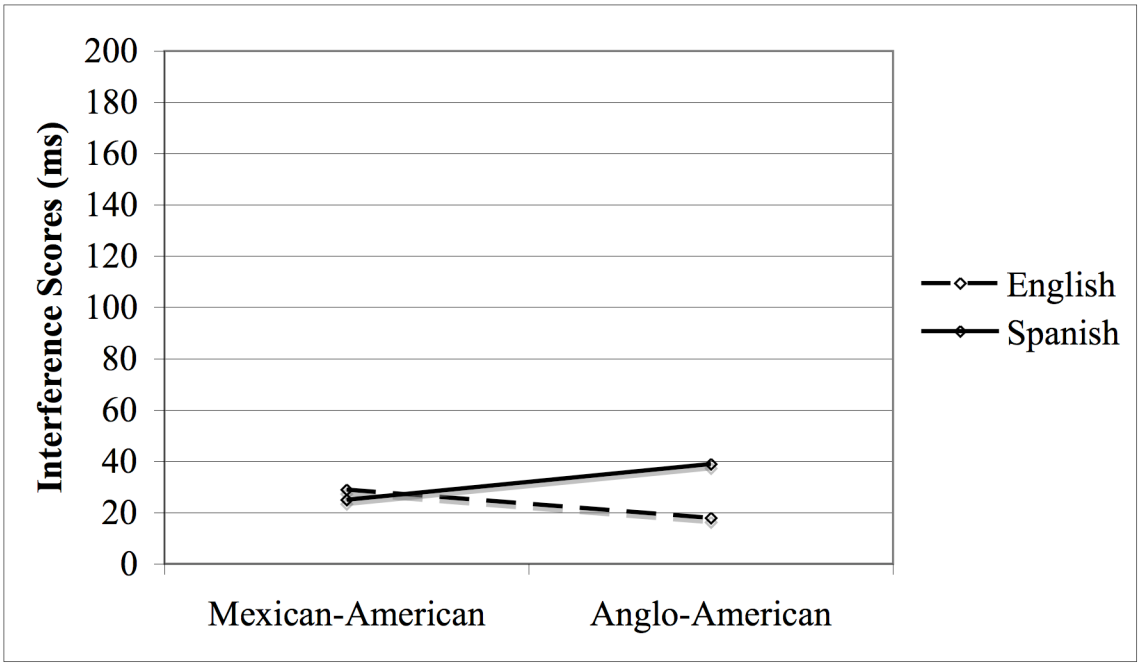


Figure 5. Interference as a Function of Prime Language and Target Ethnicity for Mexican-Americans in Experiment 2.

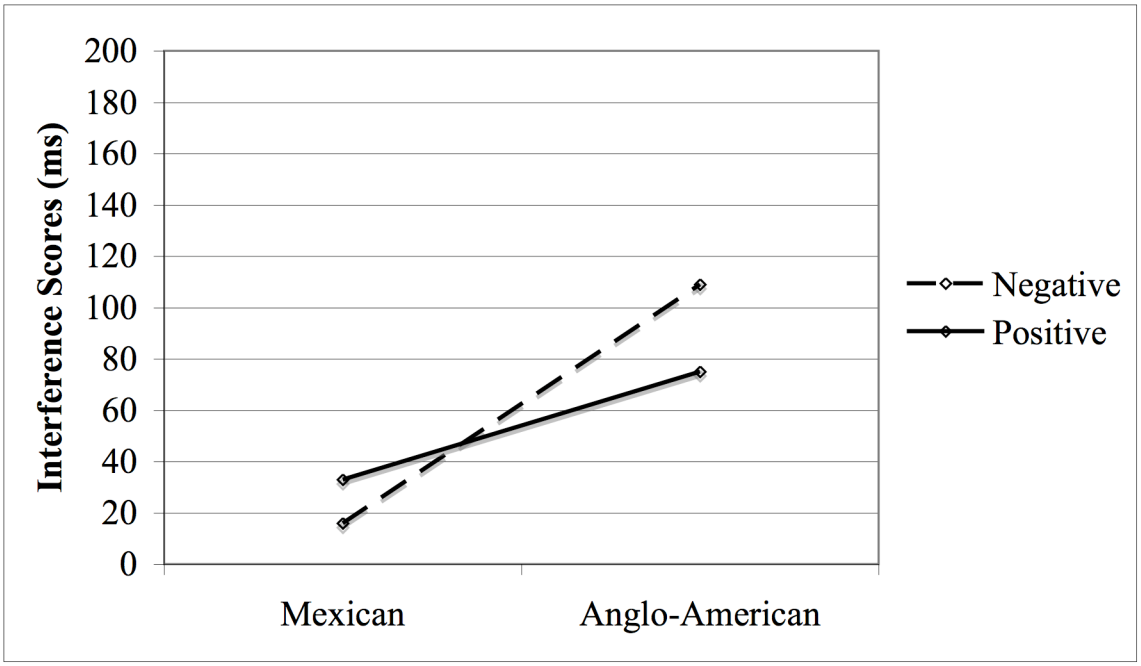


Figure 6. Interference as a Function of Prime Valence and Target Ethnicity for Mexican-Nationals in Experiment 2.

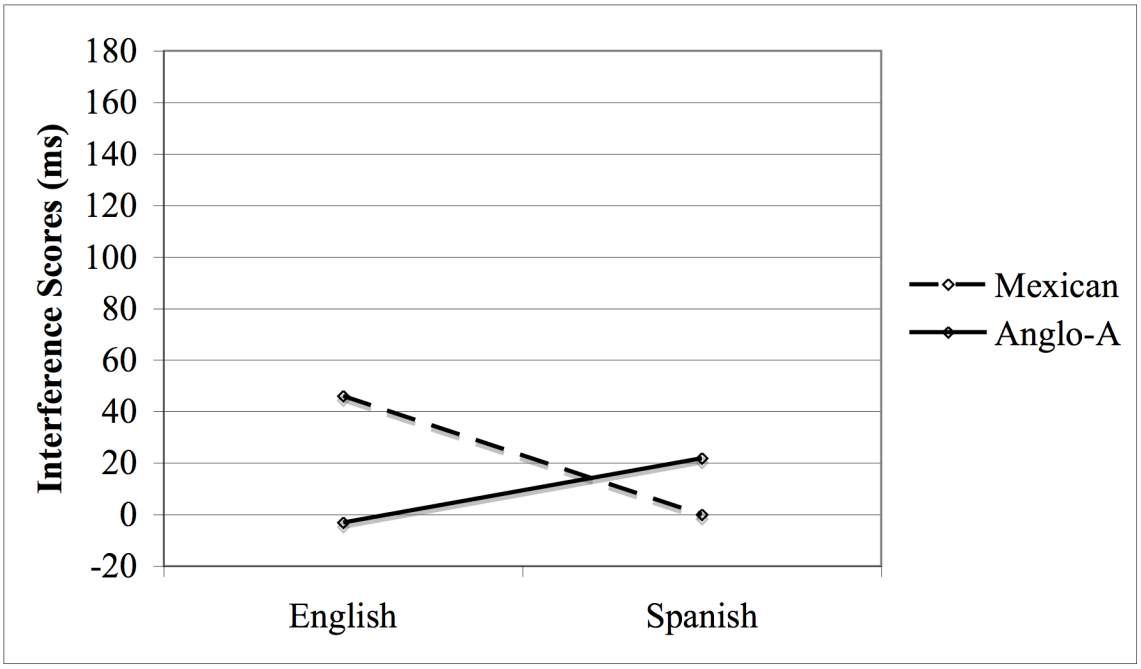


Figure 7. Interference as a Function of Prime Ethnicity and Target Language for Anglo-Americans English-dominant in Experiment 3.

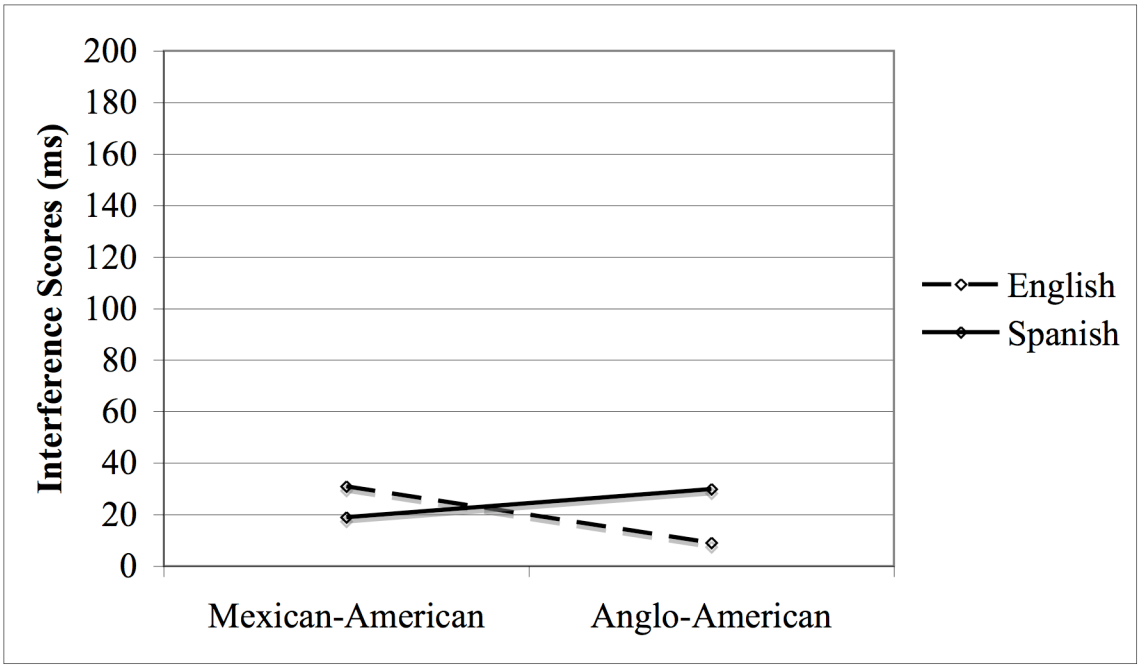


Figure 8. Interference as a Function of Prime Language and Target Ethnicity for Mexican-American bilinguals in Experiment 4.

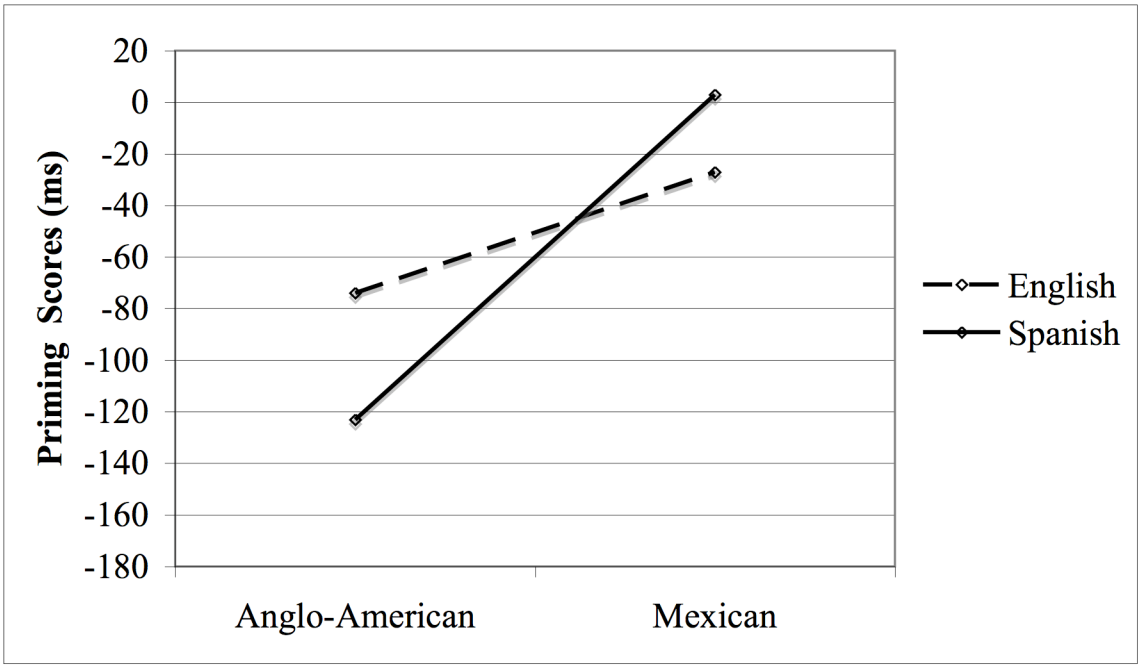


Figure 9. Priming as a Function of Prime Language and Target Ethnicity for Anglo-American English-dominant in Experiment 4.

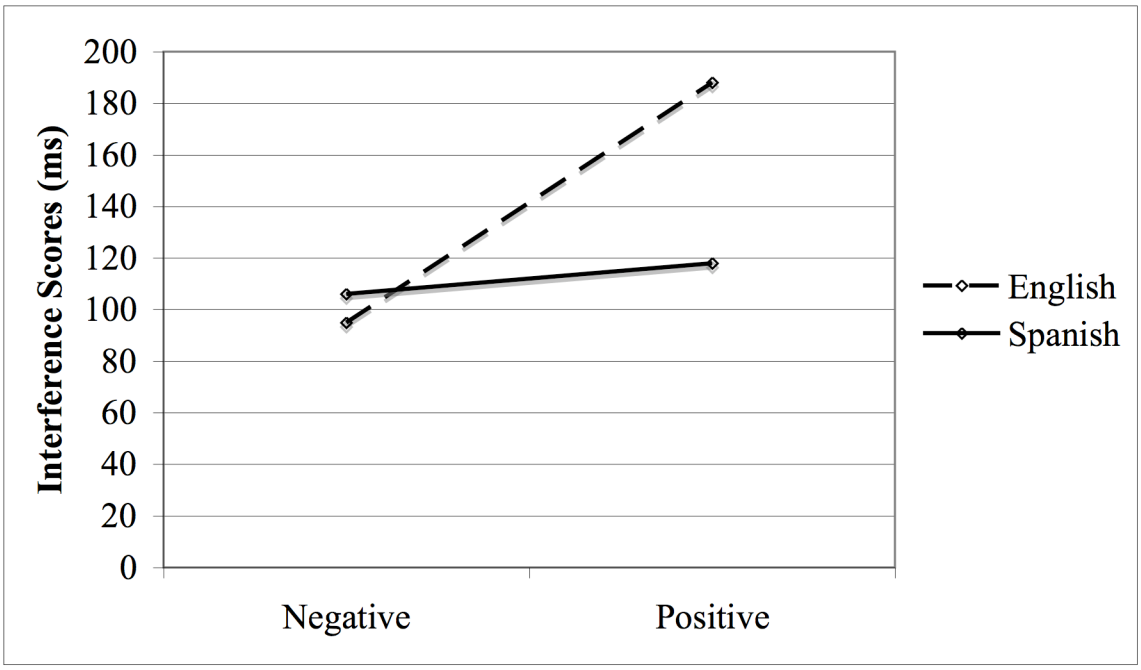


Figure 10. Interference as a Function of Prime Language and Target Valence for Spanish-dominants in Experiment 5.

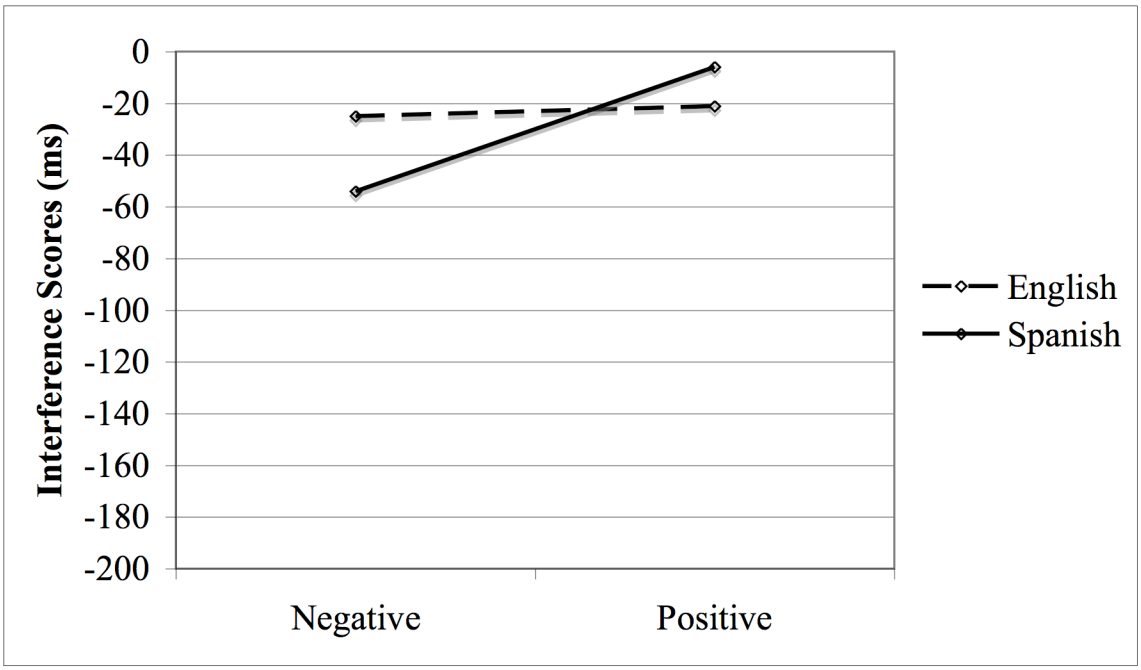


Figure 11. Priming as a Function of Prime Language and Target Valence for English-dominants in Experiment 5.

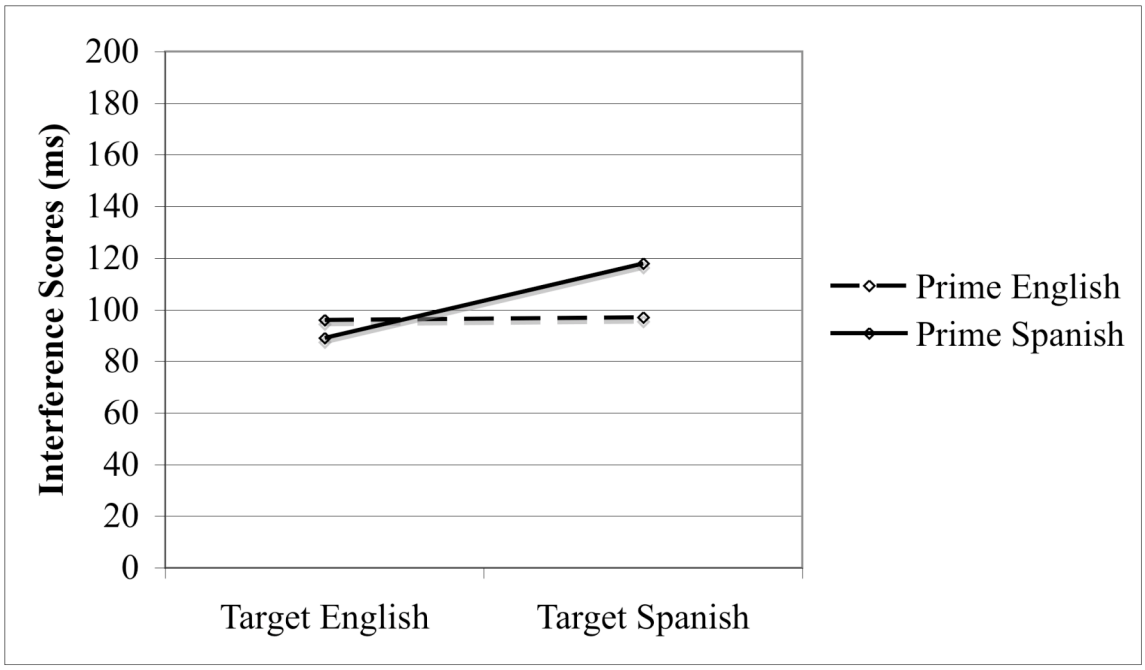
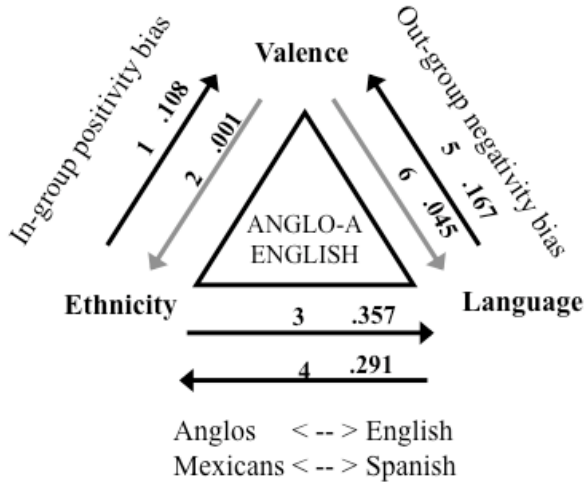


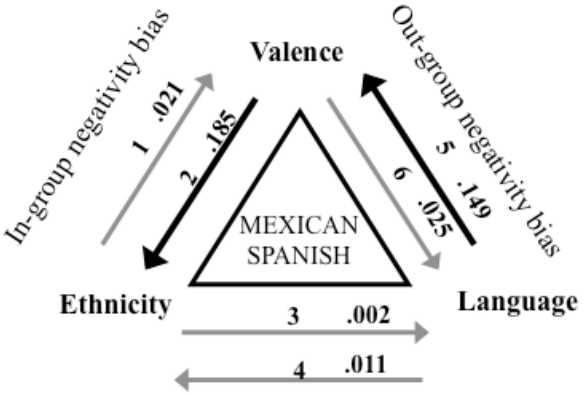
Figure 12. Interference as a Function of Prime Language and Target Language for Bilinguals in Experiment 6.

Figure 13. Ethnic and Language Attitudes Model with significant and marginally significant findings for the three samples with partial eta squared effect size measures for the critical interactions.

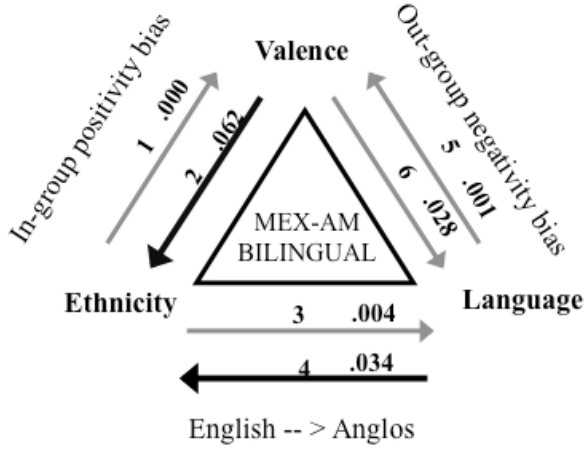
A)



B)



C)



CURRICULUM VITAE

Eva Margarita de la Riva López earned her Master of Arts degree in Experimental Psychology in 2005 from the University of Texas at El Paso. Her thesis is currently in press in the journal *Memory*. In 2006, she joined the psychology doctoral program in the Cognitive, Social and Neuroscience area.

Dr. de la Riva has been recipient of numerous honors and awards including the Outstanding Research Achievement award from the psychology and physics education department. She has presented her research at several regional and national conferences. She has also presented her research internationally in Canada, Spain and Mexico. Moreover, she has received grant support from the National Science Foundation and the National Institute of Health among others.

While pursing her degree, Dr. de la Riva worked as a research assistant for the Bilingual Cognition and the Neurocognitive Genetics and Developmental Neurocognition laboratories. Furthermore, she has taught several classes at UTEP, El Paso Community College and the Paul Foster School of Medicine. She was commended for outstanding service to students by the TRIO program at UTEP.

Dr. de la Riva will join the psychology department as a tenure-track assistant professor at Oakton Community College in Des Plaines, Illinois.