

Research Article

Open Access

Cultural Affirmations to Increase Cognitive Resources Available in Latinx Individuals

Scott M. Barrera*, Kristin Perrone, Stephanie Simon-Dack
Ball State University, IN, USA

Article Info

Article Notes

Received: January 20, 2025
Accepted: April 02, 2025

*Correspondence:

*Dr. Scott M. Barrera, Ball State University, IN, USA. Email: barrerascott12@gmail.com

©2025 Barrera SM. This article is distributed under the terms of the Creative Commons Attribution 4.0 International License.

Keywords:

Cultural Affirmations
Latinx
Event-related Potentials
Identity Saliency

Abstract

Introduction: The purpose of this study was to examine the effect of cultural affirmations on the neural activity of Latinx individuals. Latinx participants viewed threatening stimuli after completing a cultural affirmation intervention. We also examined the impact of identity saliency on the effectiveness of cultural affirmations.

Method: To understand relationships between these variables, 28 Latinx participants (19 female) viewed photos of angry and neutral white, non-Latinx, faces while event-related potentials (ERPs) were recorded before and after engaging in a cultural affirmation writing task.

Results: Scalp map assessment showed large effects for N2 in the frontal region. Repeated measures ANOVA indicated average N2 amplitudes were higher following the cultural affirmation, specifically in the right hemisphere. As predicted, the relationship was no longer significant when identity saliency was controlled.

Discussion: After engaging in cultural affirmations, Latinx participants' N2 amplitudes increased, indicating the affirmation increased the availability of preconscious social categorization resources to allocate to the angry and neutral white, non-Latinx, faces. However, when identity saliency was controlled, there were no changes in available neural resources.

Conclusion: Theoretical and clinical implications are discussed as well as future directions for researchers on how cultural affirmations may be utilized among Latinx individuals with consideration to identity saliency.

Introduction

The Latinx community represents over 18.7% of the population of the United States.¹ By 2060, it is estimated that the Latinx population will comprise more than 30% of the U.S. population.² Latinxs face a number of unique stressors that negatively impact mental health, including immigration, family separation, acculturation, social ostracism, prejudice, and discrimination.³⁻⁵ In addition to facing these unique stressors, Latinx individuals also undergo processes of identity development in which they begin to integrate their racial-ethnic identity into their self-concept⁶. Researchers have found that as Latinxs engage in this integration, they experience an increased sense of belonging and commitment to the group while sharing similar experiences and values.⁷ A strong racial-ethnic identity has health promoting effects that mitigate the impact of stressors such as discrimination.⁸ Therefore, while the Latinx community may face unique stressors due to discrimination of their identity which negatively contribute to mental health outcomes, a strong sense of racial-ethnic identity may also serve as a protective factor against these stressors.

In addition to having a strong racial-ethnic identity, affirmations are a means to cope with stressors. Researchers have demonstrated that self-affirmations can improve psychological well-being and increase the ability to manage prejudice and discrimination.^{9,10} While empirical evidence supports the benefits of affirmation interventions, the underlying mechanisms have yet to be fully identified or explained. To explore the underlying mechanisms of therapeutic interventions, Gonçalves and Perrone-McGovern¹¹ highlighted the need for psychologists to utilize neuroscience methodologies to examine the brain-mind relationship and explore how an individual may respond physiologically to given stimuli or interventions.

In this study, we sought to extend past research on self-affirmation theory and social identity theory by using event-related potentials (ERP) methods to understand cognitive resource allocation during a threat response task before and after a cultural affirmation intervention. More specifically, this study examined the resource allocation when categorizing angry and neutral white, non-Latinx, faces. These stimuli were used because angry expressions are considered natural signs of threat while white, non-Latinx, faces are historically associated with perpetrators of racism.¹² Furthermore, by exploring the relationship between a cultural affirmation intervention while controlling for identity salience, psychologists can effectively understand how treatment adaptations may be beneficial when working with Latinxs. Lastly, results from this study can inform future directions for research on affirmations and the integration of neuroscience methodologies.

Self-Affirmation Theory

In self-affirmation theory, Steele¹³ asserts that one is motivated to maintain their identity or sense of self. Through their lives, individuals are not only driven to maintain a sense of self, but to protect their sense of self from threats (e.g., asserting one's adequacy when being challenged or threatened). One strategy for reducing the threat to one's sense of self is to engage in self-affirmation techniques.¹⁴ Sherman and Cohen¹⁵ identified a key tenet of self-affirmation theory as the ability for individuals to be affirmed by engaging in activities that remind them of their identity and values. McQueen and Klein¹⁶ noted self-affirmation interventions include opportunities for an individual to write an essay or complete a scale or exercise in which they are able to explain why a value or life domain is important to them. Therefore, qualities or values that are central to a person are potential domains of self-affirmation. This can include domains such as friends, family, hobbies, or salient identities such as race and ethnicity.^{10,17}

Affirmation Interventions

A self-affirmation has been described as a flexible

copying strategy to manage stressful events by highlighting one's own values, beliefs, identities or other personally held roles.¹⁵ Cohen and Sherman¹⁴ elaborated on self-affirmation theory by proposing self-affirmations may increase self-efficacy and one's ability to manage future encounters of threatening stimuli while simultaneously reinforcing personal values. Consistent with this assertion, Badea et al.¹⁸ found self-affirmation interventions led to a reduction in prejudice by affirming personal values prior to reviewing discriminatory policies of immigration/refugees. Researchers have demonstrated positive associations with self-control¹⁹, behavioral engagement²⁰, and prejudice reduction.²¹ The abundance of research evidence supporting the positive psychological benefits highlights the potential of utilizing self-affirmation interventions within a counseling setting to improve psychological well-being.

Specific to Latinx individuals, Adams et al.²² found self-affirmation interventions to be effective in reducing perceived prejudice by examining perceived racism among white and Latinx individuals when engaging in self-affirmations. They found that self-affirmations reduced perceived racism among Latinx individuals while increasing perceptions of racism among white individuals. However, these results are not always consistent across studies.²¹ One potential explanation for these discrepancies may be explained by differences in cultural values and orientations. Hoshino-Browne et al.²³ demonstrated self-affirmations for people from collectivistic cultures may not be as effective as self-affirmations for people from individualistic cultures which the researchers proposed was due to affirming the important aspects of the self. Therefore, an interdependent cultural affirmation may be more appropriate for Latinx people from collectivistic cultures.

Cultural Affirmations

Cultural affirmations can highlight positive attitudes and feelings about one's racial-ethnic identity, increase a sense of belonging, and protect against racial threat.²⁴ Stock et al.¹⁰ examined the protective mechanisms of both racial-ethnic and self-affirmation interventions for Black adults on reducing substance use cognitions when racial exclusion occurred. This study utilized an online Cyberball game which simulates social ostracism, and in this study, it was used specifically for racial ostracism, followed by affirmation writing (self, racial-ethnic, or neutral) and psychological self-report measures of substance use cognitions, anger, and manipulation checks. The results suggested the cultural affirmation writing condition was protective against racial exclusion as noted by reduced anger, perceived discrimination, and fewer substance use cognitions.

Further evidence to suggest utilizing cultural

affirmations among Latinx populations can be found in literature on familismo. Familismo is a cultural value that prioritizes family well-being and emphasizes the role of family as a sense of support.²⁵ Researchers established a positive association between familismo and well-being.^{26,27} With regard to affirmations, Covarrubias et al.²⁸ found family affirmations were more effective than individual affirmations when it came to improving student performance among Latinx students. Therefore, cultural affirmations (i.e., prioritizing cultural values such as family) among Latinx individuals who come from collectivistic cultures may be more beneficial than self-affirmations. While research and theory support the benefits of utilizing cultural affirmations, additional research is necessary to establish the utility of these affirmations among Latinx individuals. Additionally, we cannot assume that all people who hold the same identity also hold the same views or values; we must also consider social identity and identity salience.

Social Identity Theory and Latinx Identity Development

Tajfel and Turner⁶ describe a general assumption of social identity theory that an individual works to maintain or enhance their self-esteem related to their salient social groups. One's identity within a social group is evaluated based upon social comparison through the process of group differentiation forming an ingroup and outgroup. This differentiation is then utilized to maintain or enhance one's self-esteem related to their social identities.¹⁹ However, the underlying assumption is that one must first have internalized their social group membership as an aspect of their self-concept. Thus, the individual's social group identity must be salient or central to the individual's self-concept to be activated or accessible when threatened.^{29,30}

Racial-ethnic identity is a cultural component of social identity that refers to the sense of identification with others with similar cultural heritage, attributes, values, traditions, and language.^{31,32} Latinx identity development is associated with cultural socialization where Latinx individuals generate beliefs about in-group and out-group members.³³ These processes of racial-ethnic identity development can lead individuals to distance themselves from their Latinx identity if the experiences are negative, or more strongly identify with their culture if the experiences are positive.³⁴ Therefore, identity development is a unique experience for each person and leads to varying degrees of identity salience. Researchers found Latinxs with higher racial-ethnic identity salience have an increased sense of belonging as well as stronger commitment to the social group based upon shared values.^{7,31} Additionally, high racial-ethnic identity salience is positively associated with self-esteem³⁶ and more positive attitudes toward outgroups.³⁷ Therefore, it is important to consider how

identity salience may impact the effectiveness of cultural affirmation interventions.

Event-Related Potentials (ERP)

Neuroscience research methods provide a brain-based perspective to the study of affirmation interventions. ERP techniques use electroencephalograms (EEG) recordings to examine the neural response to a stimulus.³⁸ The neural response pertains to cognitive resources allocated to processing the target stimulus. Neural activity is detected using electrodes affixed to the scalp, which record the brain activity that is time locked to a stimulus and provides a temporally sensitive measure (within ms). Neural activity is recorded over multiple trials, which are then averaged to establish ERPs, allowing researchers to identify associations between the stimulus and neural response.³⁹ The temporal sensitivity of ERP is valuable to understanding neural responses to stimuli while also circumventing social desirability factors and conscious awareness.⁴⁰ The other notable benefit of ERP is that it accesses a covert measure of processing that cannot be accessed with behavioral measures. Specifically, it is difficult to obtain behavioral responses for both attended and unattended stimuli because if a participant is able to provide a response to an unattended stimulus, then the stimulus was not truly unattended.³⁹

Relevant Wave Components

Components specify the point along the waveform (i.e., delay after the stimulus is presented) that is being examined. The name of the component denotes the direction (i.e., positive - "P" and negative - "N") and latency (e.g., 100, 200, 300 ms) of the peak or trough. Additionally, these peaks and troughs are the maximal activation for a specific process that is taking place neurally.⁴¹ The two wave components that have particular relevance in the investigation of the relationship between identity salience and processing of negative stimuli are N2 and P3. The N2 component, occurring approximately 200 ms after the presentation of a stimulus, is an indicator of preconscious social categorization. More specifically, the anterior N2 is a negative frontal deflection that is often interpreted as selective attention to and encoding of individuating information as well as deeper levels of attention.⁴² The N2 has allowed researchers to detect attentional processing of ingroup and outgroup members based on social identities such as racial-ethnic identity. Among racial-ethnic groups, researchers have found that larger N2 amplitudes are produced when participants view stimuli of ingroup populations, compared to outgroup populations.⁴³ Utilizing the framework of social identity theory, Latinx participants will engage in social comparison through the process of group differentiation while viewing non-Latinx white stimuli as a way to maintain their self-esteem related to

their Latinx identity. However, according to self-affirmation theory, an affirmation should lead participants to feel less threatened and have a decreased need to engage in social comparison.

The P3 is a peak occurring approximately 300 ms after the presentation of the stimulus. Previous research established P3 is involved in conscious processes of attention and depth of processing, task difficulty, and resource allocation.³⁹ When examining emotional stimuli, greater P3 amplitudes are thought to suggest greater depth of processing of the stimuli.⁴⁴ With regard to emotional stimuli, faces depicting emotional expressions is a common approach in many ERP studies due to their relevance in daily interactions. Bar-Haim et al.^{12(p13)} stated “an angry or fearful facial expression is a natural sign of potential threat, whereas a threat word is an arbitrary symbol”. Angry and fearful facial expressions compared with neutral expressions increase the amplitudes of positive ERP components starting early in the frontocentral sites (around 120-180 ms post-stimulus).⁴⁵

There are a limited number of studies that have explored affirmations using ERP. Legault and colleagues⁴⁶ conducted one of the first ERP studies to understand neural correlates of affirmation interventions. They conducted a study examining neural responses on a go/no-go task between a self-affirmation condition and no affirmation condition. The go/no-go task requires individuals to respond to certain stimuli and inhibit responses to other stimuli. Results indicated the self-affirmation condition allowed for more cognitive resources to be allocated to attending to the feedback given during the task as noted by increased feedback-related negativity (FRN) amplitudes. Building on those results, Gu et al.⁴⁷ found self-affirmations increased P3 responses compared to non-affirmed individuals when completing an ambiguous gambling task. These results indicate the affirmation condition allowed for more resources to be allocated to attending to the stimulus and coping with uncertainty than in the non-affirmed condition.

Gu et al.⁴⁸ identified self-affirmations as helpful to coping by allowing earlier processing of threatening stimuli and an increased number of cognitive resources to be allocated to the task resulting in increased FRN amplitudes. These results indicate the affirmation condition allowed for more resources to be allocated to attending to the stimulus than in the non-affirmed condition. While there is only a dearth of ERP research with affirmations, the results of these studies suggest affirmations could be an effective proactive strategy for mitigating perceived threat and freeing up cognitive resources for task performance which should be seen as smaller amplitudes at the P3 time point after engaging in a cultural affirmation.

The Present Study

Study Purpose

Our aim in the present study was to build upon existing theories by addressing gaps in the literature related to cultural affirmations among Latinx individuals, while also using EEG methods to expand our understanding of neural processes associated with these affirmations. Building upon the assumptions of self-affirmation theory, we examined the effect of cultural affirmations to see if they function similarly to self-affirmations in reducing perceived threat of angry-faced stimuli for Latinx participants. While research indicates cultural affirmations can decrease defensiveness of white individuals and act as a protective factor for Black individuals, there is a lack of research on how cultural affirmations may affect Latinxs specifically. Therefore, this study aimed to build upon existing theories by addressing gaps in the literature related to cultural affirmations among Latinx individuals, while also using a neuroscience approach to expand the understanding of neural activity while engaging in these affirmations. In the present study, we examined the allocation of neurobiological resources among Latinxs viewing emotionally charged images before and after engaging in a cultural affirmation intervention. In addition to self-affirmation theory, our study was informed by Tajfel and Turner’s social identity theory.⁶ According to social identity theory, it is important to consider identity salience, as this may impact the effectiveness of affirmations²³ and reduce the psychological benefit.^{14,31} Therefore, we sought to control for the potential differences in identity salience among Latinxs engaging in cultural affirmation. Based on previous literature, we expected to see effects in the P3 and N2. We expected N2 amplitudes to increase following the cultural affirmation, indicating an increased the availability of preconscious social categorization resources to allocate to the angry and neutral white, non-Latinx, faces. For the N2, we would also expect a right lateralized effect related to temporality because preconscious stimulus perception and categorization at 200 ms is associated with right hemisphere laterality.^{49,50}

For the P3, we expected that engaging in cultural affirmations would lead to decreased P3 amplitudes for angry faced images indicating less cognitive resources were needed for in-depth emotional processing of angry faced images (i.e., reduced the perceived threat of angry white, non-Latinx, faces). We expected the P3 effect to be lateralized to the left hemisphere in the prefrontal cortex because this is associated with approach behaviors such as anger whereas right lateralization is associated with avoidance behaviors such as sadness and fear^{51,52}, and we expected that engaging in cultural affirmations would not affect P3 amplitudes for angry faced images when controlling for identity salience because research

has suggested the effectiveness of cultural affirmations depends on cultural identity salience.²³

Method

Transparency, Openness and Reproducibility

This study was not pre-registered, and all hypotheses are considered exploratory. Sampling and data exclusions are discussed in further detail in subsequent sections. All procedures and materials are described below with access to data in a data repository accessed through: <https://osf.io/ay7em/>.

Participants

Prior to initiation of the study, IRB approval was obtained. The sample included students and staff from a midsized university who were recruited via e-mail advertisement and using an undergraduate research data pool (i.e., SONA). Participants were compensated with either two hours of research credit or monetary compensation for their time. All participants (N=30) identified as having Latinx or Hispanic origins and were over the age of 18. However, two participants were removed from the final analysis because one of the participant's data was not recorded correctly and the other was removed due to EEG artifacts (e.g., muscle movement and electrical interference) that rendered the EEG data unusable. Thus, there were 28 participants included in the final analysis (19 female; 9 male) whose ages ranged from 18 to 56 ($M=25.07$, $SD= 8.6$). Of the 28 participants, the majority identified their race as "other" and described their race using terms such as "Chicano", "Mestizo", "Latinx" or "Hispanic" (N=15); followed by "White/European American" (N=10), with the remaining participants reporting their race as "Native American/Alaska Native" (N=3). Lastly, regarding spoken language, most participants identified as bilingual or multilingual (N=22) with the majority learning English as a second language (N=17). This study utilized a within-subject design; therefore, all 28 participants completed the same experimental procedure. This design was chosen due to the nature of ERP data collection procedures and to limit extraneous variables due to neurological conditions. This is consistent with previous studies examining neural mechanisms while completing affirmations.⁵³

Measures

Collective Group Self-Esteem Scale

As part of the screening process, participants completed an identity salience measure. An adapted collective group self-esteem scale (CSE)³⁴ was administered to assess participant's Latinx identity membership, private collective self-esteem, public collective self-esteem, and identity importance using a 7-point scale (1=strongly disagree to 7=strongly agree). The membership subscale assesses

how one feels about their worth to their Latinx identity. The private collective self-esteem subscale assesses how good one believes their racial-ethnic group is. The public collective self-esteem subscale assesses how one believes others evaluate their racial-ethnic group. The identity importance subscale assesses how important one's group is to their self-concept. This measure has shown high reliability ranging from .73 to .82 with the total scale having alphas of .85.^{34,54} Luhtanen and Crocker³⁴ reported the four subscales accounted for 60.7% of the variance and loadings ranged from .54 to .83 with each item loading to only one factor. Responses showed moderate convergent validity with Rosenberg measure of personal self-esteem while the subscale, membership, showed a correlation of .42. Cronbach's alpha reliability for the present study was .76.

Demographic Questionnaire

This included questions about the participants' age, sex, gender, sexual orientation, race, and languages spoken. Additionally, questions about neurological conditions, substance use, vision and hearing problems, and use of psychotropic medications were also included.

Affirmation Manipulation Check

The manipulation check consisted of five items similar to previous affirmation studies which asked participants to indicate the extent the affirmation task made them think of positive aspects of their Latinx/Hispanic identity.⁵⁵ Participants responded on a scale of 1 (strongly disagree) to 5 (strongly agree) with higher scores indicating that the task made participants focus on their values. Knight and Norman⁵⁵ reported Cronbach's alpha reliability estimate of .86. Cronbach's alpha reliability estimate for the present study was .73.

Experimental Procedure

First, interested participants completed a screening survey to determine eligibility prior to the main study. Eligible participants were invited to the EEG lab where they signed the main study informed consent and were seated in front of a computer while a researcher fit them for a cloth cap which included 64 pin-type electrodes for EEG recording. After the electrodes were placed, participants were introduced to the oddball paradigm through a practice task. Next, participants completed the first main task (described in greater detail in subsequent sections). Following the main task, individuals engaged in a cultural affirmation intervention. Following the affirmation intervention, participants completed a second oddball paradigm with different, but equally balanced images. Lastly, participants completed a brief manipulation check. EEG data was collected with a 64-channel ActiveTWO system from BioSemi. Electrical potentials from facial muscles were recorded with electrooculography (EOG) by placing two flat-type electrodes on the participant's face,

one to the right of the right eye and the other below the right eye. Two more flat-type electrodes were placed on both the left and right mastoid serving as references. The Common Mode Sense (CMS) and Driven Right Leg (DRL) electrodes were used to form the ground allowing for a feedback loop to be created and data collection stored. EEG data were initially collected with a 2048 hz sampling rate then resampled offline at 512 hz for analysis. Data were filtered offline between .5 and 55 hz using a Butterworth filter and digitally referenced to the average of the activity of the two mastoid electrodes and then visually inspected for major muscle artifacts, which were manually removed. Data were then subjected to independent component analysis (ICA), which was used to remove regularly occurring motor artifacts such as eyeblinks and saccades. This resulted in approximately 95% of trials retained across all conditions. Independent component decomposition was run on the continuous data using the ‘runica’ INFOMAX algorithm.⁵⁶ On average, 6 components associated with eye artifact were removed per participant across 64-scalp and 2-EoG electrodes. Scalp electrodes that were not suitable for analysis were removed before the ICA was performed and then interpolated back into the data set afterwards using spherical interpolation in EEGlab. On average, 3.5 electrodes were removed per participant, none of which were used for the ERP analyses.

Affirmation Intervention

Consistent with previous researchers¹⁰, participants received the following adapted prompt “In the space provided below, please write about a specific time that made you feel good about being Latinx or Hispanic and the positive emotions that you felt” and were given 5 minutes to write a response to this prompt.

Oddball Paradigm

The oddball paradigm in which participants are asked to identify less frequent target stimuli from a sequence of more frequent stimuli is the most common way to elicit N2 and P3 amplitudes.⁵⁷ The paradigm is presented as a visual discrimination task which requests participants to identify angry faces among neutral faces by pressing a button. Angry and neutral faced pictures were derived from the Karolinska Directed Emotional Faces (KDEF).⁵⁸ This image set includes photographs of 70 individuals (35 male and 35 female) of Swedish nationality. A validation study of the image set included information regarding recognition rates and arousal which was measured on a 9-point scale ranging from 1 (calm) to 9 (aroused).⁵⁹ Based upon these ratings, the highest recognition rates for angry images as well as the arousal ratings were used to create two image sets of equivalent emotional arousal. The first image set included M11AN, M17AN, F20AN, and F31AN which had an average recognition of 98.5% and average arousal

of 4.1. The second image set included M10AN, M05AN, F14AN, F23AN with an average recognition rate of 99.6% and average arousal of 4.0. Participants were presented with these angry faces along with accompanying neutral faces in a task designed in E-Prime (Version 2.0). The task included a blank screen presented with a fixation cross ‘+’ to direct participant’s eyes to the center of the screen 250 ms before stimulus onset. This cross was replaced by an angry- or neutral-faced picture for 200 ms. Visual stimuli were followed by a delay of 600 to 800 ms. Consistent with the oddball procedure of Mark and colleagues⁴⁴, target stimuli or angry faces were approximately 30% of the total stimuli resulting in 100 target angry-faced images and 300 standard neutral faced images.

Results

Assessment of Scalp Map

To calculate the ERPs, epochs of -200 to 600 ms post-stimulus onset were calculated. Baseline correction consisted of subtracting the voltage -200 to 0 ms from pre-stimulus onset to stimulus onset. An effect for the P3 component was not observed in the present study. However, we did observe large effects for N2 in the frontal region. Based upon the observed presentation of the N2 component collapsed across all participants and conditions, N2 analyses were computed between 175ms and 300ms post stimulus using area-under-the-curve analysis for 8 electrodes across the frontal region in the left hemisphere (F3, F5, FC3, FC5) and right hemisphere (F4, F6, FC4, FC6; Figure 1).

Behavioral Data

Prior to engaging in a cultural affirmation, the mean reaction

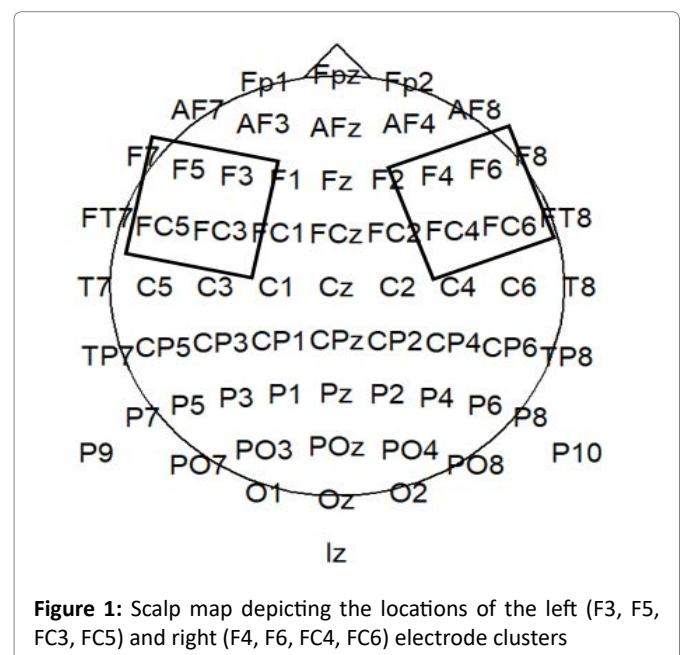


Figure 1: Scalp map depicting the locations of the left (F3, F5, FC3, FC5) and right (F4, F6, FC4, FC6) electrode clusters

time for the angry-faced images was 456 ms and participants were over 95% accurate in identifying the angry-faced images. Following the cultural affirmation, mean reaction time for the angry-faced images was 467 ms and participants were over 97% accurate in identifying the angry-faced images. Paired samples t-tests were conducted to compare differences before and after the affirmation on reaction time and accuracy and there were no significant differences.

Analyses

Prior to analysis, a manipulation check was conducted to ensure stimulus differences between neutral and angry faces were present. Paired samples t-test were run comparing neutral and angry female faces as well as neutral and angry male faces. Results indicated there was a significant difference between neutral and angry faces (Table 1). Thus, the manipulation of emotional valence of the faces was perceived and resulted in different neural activity while viewing each category of image. In addition to conducting a manipulation check of emotional valence, it was also important to ensure individuals felt affirmed following the writing task. Because this was a within-subject design, we were unable to compare those who engaged in the affirmation and those who did not. Instead, we compared average scores on the manipulation check with previous studies that utilized the same manipulation check. Knight et al.⁵⁵ found average scores ranging from 3.72 to 3.82 as significant manipulations compared to control groups. The manipulation check in this study resulted in higher averages of 4.32 suggestive that the manipulation check was satisfactory compared to previous studies. Lastly, because the gender of the stimulus was not an interest of this study, the stimuli were averaged across gender to create one variable.

Following the manipulation check, we conducted repeated measures ANOVA to examine laterality and affirmation effects. Assumptions of normality and sphericity were checked and there were no violations. The results showed a significant interaction between affirmation and laterality on N2 amplitudes, $V = .155$, $F(1, 27) = 4.97$, $p = .03$, $n^2 = .16$. The interaction indicates participants demonstrated larger N2 amplitudes following the cultural affirmation, particularly in the right hemisphere when viewing angry and neutral faced images (Figure 2).

Additionally, to further explore the relationship between the affirmation intervention and laterality, we

Table 1: Mean N2 amplitudes grand averaged bilaterally for angry and neutral images by gender of stimulus

Gender of Stimulus	Emotional Expression	M	SD
Male	Neutral	-4.51	2.19
	Angry	-2.55	2.49
Female	Neutral	-4.96	2.41
	Angry	-3.06	2.49

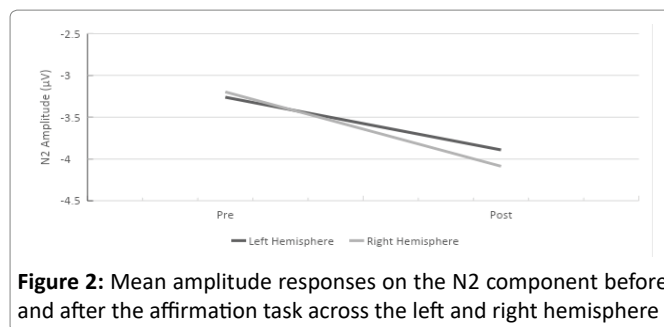


Figure 2: Mean amplitude responses on the N2 component before and after the affirmation task across the left and right hemisphere

included a covariate of identity salience on the model to control for possible effects of identity salience by running repeated measures ANCOVA. We expected to find that including identity salience as a covariate, the N2 results would not differ before and after the cultural affirmation. Results confirmed this expectation and indicated that when including identity salience as a covariate, the interaction between laterality and affirmation on N2 amplitudes was no longer significant, $V = .031$, $F(1, 27) = .842$, $p = .37$, $n^2 = .03$. There were no significant main effects for affirmation, $V = .027$, $F(1, 27) = .73$, $p = .40$, $n^2 = .03$ or laterality, $V = .021$, $F(1, 27) = .566$, $p = .46$, $n^2 = .02$. These results suggest that while controlling for the effects of identity salience, there was no relationship between laterality and affirmation on N2 amplitudes. This finding is consistent with previous speculations on the effects of identity salience when engaging in cultural affirmations.²³

Discussion

The purpose of this study was to better understand how cultural affirmations of Latinx individuals impact neural activity while viewing emotionally charged images, and how identity salience influenced this effect. Self-affirmation theory¹³ and social identity theory⁶ provided a framework for understanding these relationships. Our results indicated after engaging in a cultural affirmation, participants demonstrated increased N2 amplitudes primarily in the right hemisphere with no differences in P3 amplitudes. The larger N2 amplitudes indicate the cultural affirmation increased available preconscious categorization resources allowing more resources to be allocated to processing of the angry and neutral faces that were presented. The lateralization of the larger N2 amplitudes to the right hemisphere is also consistent with previous research indicating the cultural affirmations allowed for greater processing of emotional stimuli.⁵⁰ With previous literature associating larger N2 amplitudes with viewing stimuli of ingroup populations⁴³, these results are theoretically important as it suggests cultural affirmations may reduce perceived threat and minimize the need to engage in group differentiation as a strategy to enhance group-esteem. This is consistent with previous findings which indicate engaging in affirmations can bolster values and reduce perceived threat toward a collective identity.⁶⁰

Given the theoretical framework of the present study, it was important to understand the role of identity salience when engaging in a cultural affirmation. By including identity salience as a covariate in a repeated measures ANCOVA, we were able to understand how identity salience impacted the effects of cultural affirmations on Latinxs. Results indicated controlling for identity salience, the interaction between affirmation and laterality was no longer significant. Therefore, there was no difference in N2 amplitudes before and after the cultural affirmation when controlling for Latinx identity salience. This provides additional support for the nuances related to utilizing cultural affirmations such that simply affirming a cultural identity does not guarantee benefits, rather one's identity salience must be considered.

Theoretical Implications

This study was grounded in Tajfel and Turner's social identity theory⁶ and Steele's self-affirmation theory¹⁴. Based upon self-affirmation theory, individuals are motivated to enhance or maintain their sense of self through various strategies including affirming who they are or what is important to them. To adapt self-affirmations to collectivistic communities, we utilized a cultural affirmation to focus on the collective Latinx identity. The present study focused on how cultural affirmations may be utilized among Latinx individuals to reduce perceived social threat. While the results did not support our expectations related to P3, the significant results on N2 indicate support for both theories with regard to self-enhancement and social categorization. More specifically, N2 is associated with preconscious categorization of ingroup and outgroup stimuli and the results support the use of affirmation strategies to maintain the sense of self and reduce perceived threat. This study contributes to existing literature on self-affirmation theory, while also highlighting the utility of affirming collective identities. While the body of literature on affirmations, particularly among communities of color, focuses primarily on academic achievement,^{28,61} this study broadens the scope to which affirmations may be utilized beyond academic achievement to general social interactions.

Further, by utilizing an ERP methodology, this study provides important neural and temporal information about the process of cultural affirmations on preconscious group differentiation and comparison. The significant N2 effect and non-significant P3 effect provide a picture of when the benefits of cultural affirmations occur. As mentioned previously, the N2 component is associated with preconscious social categorization whereas the P3 component is associated with conscious processing. Therefore, these findings indicate the benefits of a cultural affirmation intervention likely occur prior to conscious awareness which may explain the lack of a P3 effect in that

cultural affirmations do not affect attentional resources or depth of conscious processing. Additionally, lack of a P3 effect could also be due to smaller sample size, the selected paradigm, or the facial stimuli set as these vary from previous ERP studies.^{46-48,51,52}

The present study makes a unique contribution to existing literature by controlling for the effects of identity salience when engaging in an affirmation intervention of a collective identity. While previous studies have utilized cultural affirmations, these studies did not consider the role of identity salience.^{10,28} This is particularly important when considering a collective identity such as racial-ethnic identity as this identity may not be central to their sense of self. As this study was one of the first of its kind to examine neural correlates of Latinx individuals engaging in a cultural affirmation, the focus of the study was on the effectiveness of the cultural affirmations while controlling for identity salience. Additional research is necessary to explore how identity salience impacts the effectiveness of cultural affirmations among Latinx individuals and in what direction. For example, the relationship between identity salience and targeted interventions may be quadratic such that individuals who are relatively low and relatively high on identity salience may not benefit as greatly compared to individuals in the middle. One explanation could be that low identity salience individuals would not be motivated to maintain their esteem related to social identity and therefore not benefit from a targeted affirmation task. Whereas individuals with high identity salience may already be affirmed with their social identity overall and thus, additional affirmations may not make a significant difference. This explanation is supported by previous research that demonstrates benefits of high identity salience.^{36,37} Thus, individuals somewhere in the middle may be motivated enough to maintain or enhance their esteem, but not experience the overall benefits seen in individuals with high identity salience. However, more research is needed to fully investigate these assertions.

Clinical Implications

Results from this study have implications for mental health providers who work with Latinx populations or who utilize therapy approaches centered around identity development and values. While there is a significant amount of research supporting the importance of racial-ethnic identity development³⁶ and values-based approaches (e.g., Acceptance and Commitment Therapy)⁶², this study provides additional context for how clinicians may understand identity salience among Latinx individuals. More specifically, this study highlights the potential benefits of utilizing more culturally responsive interventions such as cultural affirmations to reduce perceived threat in social situations and bolster sense of self through those with salient racial-ethnic identities.

Furthermore, when working with the Latinx population, or those who align more closely with collectivistic cultures, culturally responsive interventions may include incorporating families and communities into treatment. Interventions may include those that affirm cultural values of familismo, increase positive racial-ethnic socialization, and promote experiences that affirm one's sense of self through the family or community unit. Recent research has highlighted the flexibility of affirmations, for example finding that time spent with peers with similar identities can serve as microaffirmations and lead to increased ethnic-racial identity salience and pride.⁶³ Thus, it is recommended that clinicians strive to affirm and empower Latinx individuals through promotion and celebration of racial-ethnic identity.

This study also provides unique directions for future clinical interventions given the brevity of the intervention utilized in this study. This study utilized a 5-minute writing affirmation which resulted in an increase in available neural resources. With the recent COVID-19 pandemic, mobile health interventions are becoming increasingly popular,⁶⁴ and this intervention may be easily adapted in a similar manner.

Limitations and Directions for Future Research

There are several limitations to the present study. First, the absence of a control group in this study limits the conclusions that can be drawn. Future research including a control group would serve to strengthen the findings within this study to confirm direct effects of the intervention on N2 amplitudes. Furthermore, the sample size, while relatively common among ERP studies, is somewhat modest and thus requires caution when interpreting the data. ERP studies traditionally depend on large numbers of trials and smaller numbers of participants during data collection, as well as the veracity of solid methodological design; thus, thirty participants in a study is not atypical for ERP methodology, particularly given the within-participants design.³⁹ However, future research might aim to bolster sample size in order to examine other factors including subgroup differences such as gender, generation/immigration status and nationality because there are differences in how shared values may be learned and expressed. By expanding the diversity of participants, researchers can examine how identity salience or effectiveness of cultural affirmations may be similar or different across these subgroups.

Furthermore, while the focus of this study was to examine cultural affirmations of participants' racial-ethnic identity, we would be remiss not to acknowledge the possible gender effects that could be at play, particularly when examining cultural affirmations and interaction with cultural values of familismo. Within many Latinx families, familismo is often expressed by family members adhering to more

traditional gender roles. Within these roles researchers have found detrimental effects due to other cultural norms of machismo, expectation that men assume the dominant, often hypermasculine, role; and marianismo where women are expected to be submissive and emotional laborers.⁶⁵ Engaging in a cultural affirmation that inadvertently highlights these dynamics may impact effectiveness of these interventions. Therefore, future research may aim to explore these concepts while also examining the content of the affirmations through qualitative analysis of written narratives during affirmation intervention.

Additionally, we must consider the possibility of self-selection bias. While it was necessary for study recruitment, advertising the study specifically to individuals who identify with Latinx roots may have attracted those with a more salient Latinx identity. This is important because one of the variables of interest is identity salience. While the collective group self-esteem scale demonstrated high reliability and validity, using only one self-report measure of identity salience could lead to the construct of identity salience not being fully captured. The need to use more than one measure may be of particular importance due to the study targeting Latinx identifying individuals (i.e. they may have felt a need to respond a certain way on self-report measures related to their identity). Therefore, it may be beneficial for future researchers examining identity salience to utilize more than one measure of identity salience, or examine additional factors that may contribute to identity salience of their racial-ethnic identity such as generation status, acculturation, or nationality.

Conclusion

In the present study, we investigated how cultural affirmations affected processes of social categorization and perceived threat of emotionally distressing stimuli while considering the influence of Latinx identity salience. Findings suggested that participants benefited from cultural affirmations by freeing up preconscious social categorization resources when controlling for identity salience. These findings have important theoretical implications because they broaden the scope of self-affirmation theory to collective identities as well as highlighting the importance of considering identity salience by utilizing social identity theory as a framework. Lastly, this study provides the initial groundwork to understanding the neural benefits of racial-ethnic affirmations.

Conflict of Interest

The authors have no known conflicts of interest to disclose. No prior dissemination of this article has occurred and no financial support including grants or other funding information was provided for this study.

References

1. UnitedStatesCensusBureau [Internet]. 2020 [cited 2025 Feb 6]. Hispanic or Latino, and not Hispanic or Latino by Race. Available from: <https://data.census.gov/table/DECENNIALPL2020.P2?q=&t=Hispanic%20or%20Latino&g=010XX00US&tid=DECENNIALPL2020.P2>
2. Colby SL, Ortman JM. Projections of the size and composition of the US population: 2014 to 2060 [Internet]. United States Census Bureau; 2015. Available from: <https://www.census.gov/content/dam/Census/library/publications/2015/demo/p25-1143.pdf>
3. Findling MG, Bleich SN, Casey LS, et al. Discrimination in the United States: Experiences of Latinos. *Health Serv Res*. 2019; 54(S2): 1409-18.
4. Held ML, Lee S. Discrimination and mental health among Latinos: variation by place of origin. *J Ment Health*. 2017; 26(5): 405-10.
5. Torres L, Driscoll MW, Voell M. Discrimination, acculturation, acculturative stress, and Latino psychological distress: A moderated mediational model. *Culture Divers Ethnic Minor Psychol*. 2012; 18(1): 17-25.
6. Tajfel H, Turner JC. An integrative theory of intergroup conflict. In: *The social psychology of intergroup relations*. Monterey CA: Brooks/Cole. 1979; p:33-7.
7. Phinney JS. Stages of ethnic identity development in minority group adolescents. *JEA*. 1989; 9(1): 34-49.
8. Yip T, Wang Y, Mootoo C, et al. Moderating the association between discrimination and adjustment: A meta-analysis of ethnic/racial identity. *Dev Psychol*. 2019; 55(6): 1274-98.
9. Howell AJ. Self-affirmation theory and the science of well-being. *J Happiness Stud*. 2017; 18(1): 293-311.
10. Stock ML, Gibbons FX, Beekman JB, et al. Racial (vs. self) affirmation as a protective mechanism against the effects of racial exclusion on negative affect and substance use vulnerability among black young adults. *J Behav Med*. 2018; 41(2): 195-207.
11. Goncalves OF, Perrone-McGovern KM. Translating neuroscience into counseling practice. *Canadian JCP*. 2016; 50(4): 421-440
12. Bar-Haim Y, Lamy D, Glickman S. Attentional bias in anxiety: A behavioral and ERP study. *Brain Cogn*. 2005; 59(1): 11-22
13. Steele CM. The psychology of self-affirmation: Sustaining the integrity of the self. *Exp Soc Psychol*. 1988; 21: 261-302.
14. Cohen GL, Sherman DK. The psychology of change: Self-Affirmation and social psychological intervention. *Annu Rev Psychol*. 2014; 65: 333-71.
15. Sherman DK, Cohen GL. The psychology of self-defense: Self-Affirmation theory. *Exp Soc Psychol*. 2006; 38: 183-242.
16. McQueen A, Klein WMP. Experimental manipulations of self-affirmation: A systematic review *S&I*. 2006; 5(4): 289-354.
17. Čehajić-Clancy S, Effron DA, Halperin E, et al. Affirmation, acknowledgment of in-group responsibility, group-based guilt, and support for reparative measures. *J Pers Soc Psychol*. 2011; 101(2): 256-70.
18. Badea C, Binning K, Verhliac JF, et al. In the aftermath of terrorism: Effects of self versus group affirmation on support for discriminatory policies. *J Exp Soc Psychol*. 2018; 76: 421-8.
19. Schmeichel BJ, Vohs K. Self-affirmation and self-control: Affirming core values counteracts ego depletion. *J Pers Soc Psychol*. 2009; 96(4): 770-82.
20. Cooke R, Trebaczyk H, Harris P, et al. Self-Affirmation promotes physical activity. *J Sport Exerc Psychol*. 2014; 36(2): 217-23.
21. Badea C, Sherman DK. Self-Affirmation and prejudice reduction: When and why? *Curr Dir Psychol Sci*. 2018; 28(1): 40-6.
22. Adams G, Tormala TT, O'Brien LT. The effect of self-affirmation on perception of racism. *J Exp Soc Psychol*. 2006; 42(5): 616-26.
23. Hoshino-Browne E, Zanna AS, Spencer SJ, et al. On the cultural guises of cognitive dissonance: The case of Easterners and Westerners. *J Pers Soc Psychol*. 2005; 89(3): 294-310.
24. Stock ML, Gibbons FX, Walsh LA, et al. Racial identification, racial discrimination, and substance use vulnerability among African American young adults. *PSPB*. 2011; 37(10): 1349-61.
25. Cahill KM, Updegraff KA, Causadias JM, et al. Familism values and adjustment among Hispanic/Latino individuals: A systematic review and meta-analysis. *Psychol Bull*. 2021; 147(9): 947-85.
26. Kapke TL, Grace MA, Gerdes AC, et al. Latino early adolescent mental health: Examining the impact of family functioning, familism, and global self-worth. *JLP*. 2017; 5(1): 27-44.
27. Stein GL, Gonzalez LM, Cupito AM, et al. The protective role of familism in the lives of Latino adolescents. *J Fam Issues*. 2015; 36(10): 1255-73.
28. Covarrubias R, Herrmann SD, Fryberg SA. Affirming the interdependent self: Implications for Latino student performance. *BASP*. 2016; 38(1): 47-57.
29. Augoustinos M, Walker I. The construction of stereotypes within social psychology: From social cognition to ideology. *T&P*. 1998; 8(5): 629-52.
30. Turner JC, Oakes PJ. The significance of the social identity concept for social psychology with reference to individualism, interactionism and social influence. *British J Social Psychol*. 1986; 25(3): 237-52.
31. Stets JE, Burke PJ. Identity theory and social identity theory. *Soc Psychol Q*. 2000; 63(3): 224.
32. Phinney JS, Ong AD. Conceptualization and measurement of ethnic identity: Current status and future directions. *JCP*. 2007; 54(3): 271-81.
33. Quintana SM. Racial and ethnic identity: Developmental perspectives and research. *JCP*. 2007; 54(3): 259-70.
34. Luhtanen R, Crocker J. A Collective Self-Esteem Scale: Self-Evaluation of One's Social Identity. *Pers Soc Psychol Bull*. 1992; 18(3): 302-18.
35. Helms JE. An update of Helms people of color (poc) and white racial identity models. In: *Handbook of multicultural counseling*. Oaks CA: Sage. 1995; p:181-91.
36. Juang LP, Nguyen HH, Lin Y. The ethnic identity, other-group attitudes, and psychosocial functioning of Asian American emerging adults from two contexts. *J Adolesc Res*. 2006; 21(5): 542-68.
37. Hindriks P, Verkuyten M, Coenders M. Interminority attitudes: The roles of ethnic and national identification, contact, and multiculturalism. *Soc Psychol Q*. 2014; 77(1): 54-74.
38. Sur S, Sinha V. Event-related potential: An overview. *Ind Psychiatry J*. 2009; 18(1): 70-73.
39. Luck SJ. *An introduction to the event-related potential technique*. Bradford Book. 2014.
40. Ibáñez A, Haye A, González R, et al. Multi-level analysis of cultural phenomena: The role of ERPs approach to prejudice. *J Theory Soc Behav*. 2009; 39(1): 81-110.
41. Brandeis D, Lehmann D. Event-related potentials of the brain and cognitive processes: approaches and applications. *Neuropsychologia*. 1986; 24(1): 151-68.
42. Ito TA, Bartholow BD. The neural correlates of race. *Trends Cogn Sci*. 2009; 13(12): 524-31.
43. Dickter CL, Bartholow BD. Racial ingroup and outgroup attention biases revealed by event-related brain potentials. *Soc Cogn Affect*. 2007; 2(3): 189-98.

44. Mark RE, Geurdes FIM, Bekker MHJ. Attachment styles are related to ERPs elicited to angry faces in an oddball paradigm. *JBBS*. 2012; 2(1): 128-40.
45. Eimer M, Holmes A. Event-related brain potential correlates of emotional face processing. *Neuropsychologia*. 2007; 45(1): 15-31.
46. Legault L, Al-Khindi T, Inzlicht M. Preserving integrity in the face of performance threat: Self-Affirmation enhances neurophysiological responsiveness to errors. *Psychol Sci*. 2012; 23(12): 1455-60.
47. Gu R, Yang J, Shi Y, et al. Be strong enough to say no: Self-Affirmation increases rejection to unfair offers. *Front Psychol*. 2016; 7: 1-9.
48. Gu R, Yang J, Yang Z, et al. Self-Affirmation enhances the processing of uncertainty: An event-related potential study. *Cogn Affect Behav Neurosci*. 2019; 19(2): 327-37.
49. Gainotti G. Emotions and the right hemisphere: Can new data clarify old models? *Neuroscientist*. 2019; 25(3): 258-70.
50. Hartikainen KM. Emotion-Attention interaction in the right hemisphere. *Brain Sci*. 2021; 11(8): 1006.
51. Coan JA. Toward a neuroscience of attachment. In: *Handbook of attachment: Theory, research, and clinical applications*, 2nd ed. New York, NY, US: The Guilford Press. 2008; p:241-65.
52. Van Hoven J, Perrone-McGovern K, Simon-Dack S, et al. Attachment anxiety, stranger support, and attentional bias for relational negativity in response to pain among women. *J Rehabil*. 2019; 85: 22-33.
53. Dutcher JM, Eisenberger NI, Woo H, et al. Neural mechanisms of self-affirmation's stress buffering effects. *Soc Cogn Affect*. 2020; 15(10): 1086-96.
54. Cameron JE. A three-factor model of social identity. *S&I*. 2004; 3(3): 239-62.
55. Knight R, Norman P. Impact of brief self-affirmation manipulations on university students' reactions to risk information about binge drinking. *British J Health Psychol*. 2016; 21(3): 570-83.
56. Makeig S, Jung TP, Bell AJ, et al. Blind separation of auditory event-related brain responses into independent components. *Proc Natl Acad Sci U S A*. 1997; 94(20): 10979-84.
57. Polich J. Updating P300: An integrative theory of P3a and P3b. *Clin Neurophysiol*. 2007; 118(10): 2128-48.
58. Lundqvist D, Flykt A, Öhman A. *Karolinska Directed Emotional Faces*. 2015.
59. Goeleven E, De Raedt R, Leyman L, et al. The Karolinska Directed Emotional Faces: A validation study. *Cogn Emot*. 2008; 22(6): 1094-118.
60. Badea C, Binning K, Verhac JF, et al. In the aftermath of terrorism: Effects of self versus group affirmation on support for discriminatory policies. *J Exp Soc Psychol*. 2018; 76: 421-8.
61. Escobar-Soler C, Berrios R, Peñaloza-Díaz G, et al. Effectiveness of self-affirmation interventions in educational settings: A meta-analysis. *Healthcare*. 2023; 12(1): 3.
62. Hayes SC. Acceptance and commitment therapy, relational frame theory, and the third wave of behavioral and cognitive therapies. *Behav Ther*. 2004; 35(4): 639-65.
63. Mireles-Rios R, Garcia NM, Castro IMJ, et al. Racial micro-affirmations: Latinx close friendships and ethnic identity development. *Educ Sci*. 2024; 14(7): 737.
64. Oliveira C, Pereira A, Vagos P, et al. Effectiveness of mobile app-based psychological interventions for college students: A systematic review of the literature. *Front Psychol*. 2021; 12: 647606.
65. Palmer Rivera V, Colom Cruz A, Bacó Bonilla G, et al. The psychology of marianismo: A review of empirical research. *Salud Conducta Humana*. 2024; 111(1): 1-16.