

Perceptions of Access and Use of Tobacco Products In Latinx College Students.

Moderation by Critical Consciousness

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Within the United States, one of the leading preventable deaths and diseases is caused by the use of tobacco products, with 19.8% of adults reporting current tobacco use in 2022 (CDC, 2024). Similarly, recent data have reported tobacco use among college students at a concerning rate, with 31% of college students ever using a tobacco product and 19.7% of students using it within the past three months (NCHA, 2024). Past research suggests that specific demographics (i.e., Latinx) more risk of tobacco products use based on location due to systematic issues like “redlining” (Bostean et al., 2022). For instance, Latinxs may live in areas that contain more tobacco retailers. Due to this issue, it is important to identify factors that may impact access and use of tobacco products (Kong et al., 2024). Previous literature examining critical consciousness (CC), a key aspect of sociopolitical participation, suggests a possible moderation between systematic issues and tobacco use (Moreno et al., 2024). Thus, this study will focus on access to and use of tobacco products among Latinx college students with the moderating role of CC. It is anticipated that Latinx college students who live in close proximity to tobacco retailers will be more likely to use tobacco products. Furthermore, it is also expected that Latinx college students who highly engage in forms of CC will be less likely to engage in tobacco consumption.

Tobacco Use in Latinx College Students

In a study conducted by Sandhu et al. (2023), the authors examined the use of e-cigarettes in Latinx college students. Specifically, this qualitative study aimed to investigate e-cigarette use among college students by exploring the motivations behind their use of these products. Sandhu et al. (2023) examined social factors that encourage or discourage e-cigarette use among Latino (specifically male) college students. The thematic analysis found common themes promoting

e-cigarette use, such as repeated peer exposure, skepticism of the harmfulness of recreational e-cigarette use, and disagreement with familial views of substance use (Sandhu et al., 2023). Factors that deterred e-cigarette use were high cost, weak nicotine euphoria, and evidence of health risks. An additional study by Schmidt et al. (2018) examined perspectives based on tobacco control. Schmidt et al. (2018) explored public opinions on four potential U.S. federal tobacco regulations (nicotine reduction in cigarettes, bans on candy and fruit-flavored e-cigarettes, menthol cigarette bans, and bans on flavored little cigars) and how these are associated with individual and state-level factors. Despite differences in attitudes based on demographics, behaviors, and beliefs, most participants supported most of the proposed tobacco regulations.

Ickes et al. (2017) also examined student beliefs about the effectiveness of tobacco-free campus policies. This study aimed to identify the demographic and personal factors associated with students' beliefs/perceptions of the effectiveness of a tobacco-free campus policy and to evaluate whether a student's tobacco use status and exposure to secondhand smoke influenced their beliefs and perceptions of the policy's effectiveness. Results showed that college students held positive views toward the tobacco-free campus policy, and females expressed more positive beliefs than males. It was also suggested that cigarette and other tobacco product users were less supportive of the policy compared to non-users (Ickes et al., 2017).

Neighborhood Dynamics and Access to Tobacco Products

A study conducted by Nguyen et al. (2024) examined the complex behavior of co-use of tobacco and cannabis by classifying co-use patterns based on temporal proximity, preferred products, and motives for co-use. Qualitative thematic analysis was utilized to identify specific reasons, timing, and contexts for co-using. Results suggested a multitude of co-use patterns, with

motives for all patterns being product availability, socialization, and coping mechanisms for stress and anxiety. Regarding the co-use of tobacco and cannabis products, Nguyen et al. (2024) pointed to the accessibility and availability of products as a significant reason for co-use.

An additional study by Bostean et al. (2022) aimed to investigate specific spatial disparities within communities with large ethnic minority populations and the density of alcohol and tobacco retailers within these communities. Specifically, Bostean et al. (2022) focused on the role of nativity (i.e., generation status) and its relationship to neighborhood exposure to alcohol and tobacco retailers. Results indicated a positive correlation between first-generation and continuing generations of Latinx and Asian communities, as well as alcohol and tobacco retailer density.

Furthermore, there was a negative correlation between non-Latinx White communities and alcohol and tobacco retailer density. Bostean et al. (2022) results suggest that generation status and more dense racial/ethnic communities may warrant higher disparities in alcohol and tobacco retailer density. This was further supported by West et al. (2010) examined the proximity to retailers that sell alcohol and tobacco and their relationship to Latinx adolescent use (West et al., 2010). In addition, West et al. (2010) aimed to examine how the environment, specifically retailer distribution, plays a role in Latinx adolescent alcohol and tobacco use. This study also used a geocode method in ArcView to establish a “walking neighborhood” based on the participant's address and retailer location. The results indicated an increased risk for alcohol and tobacco use among residents living closest to retailers, even when controlling for numerous environmental influences. Although the study examined adolescents, this can be translated to the college population, especially considering the proximity to retailers that sell tobacco/nicotine products. In addition, this study also discussed socioenvironmental factors (similar to

“red-lining”) that showcase that individuals living within neighborhoods with signs of low SES are more likely to be exposed to alcohol and tobacco retailers. As a result, it may be important to examine the SES status of the place of residence in accordance with alcohol and tobacco retailers.

The Moderating Role of Critical Consciousness:

Critical consciousness (CC) is a learned way of thinking/analysis focusing on understanding and recognizing social and political inequalities (Jemal, 2017). Furthermore, critical consciousness is divided into three categories: critical reflection, political efficacy, and critical action, which have been suggested to reduce feelings of internalized oppression and lower levels of emotional distress (Chan, 2024; Morena et al., 2024). Literature examining CC and tobacco product use has focused mainly on adolescents. For example, Lee et al. (2019), examined the influence of different interventions promoting critical tobacco use awareness among marginalized adolescents. Specifically, this article examined the use of a photovoice methodology, which involves participants taking photos and creating a narrative from the “string of photos.” Using photovoice, participants were able to link the smoking behaviors they observed at school to low student morale and a lack of engagement from student officials regarding tobacco use. This process enabled the youth participants to create an action plan to raise awareness among their peers and school staff through workshops and strategic meetings. An additional study examining CC evaluated a program designed to engage adolescents in social justice as a strategy for tobacco control (Kennedy et al., 2023). Kennedy et al. (2023) examined UpRISE, a social justice movement focused on youth tobacco control that encourages diverse young individuals to explore the root causes of nicotine use among their peers. This included supportive adult relationships, youth involvement in decision-making, attitudes and beliefs

against the tobacco industry, psychological empowerment, critical consciousness, and a global belief in a just world. Results suggested that UpRISE appears to be a promising strategy for enhancing engagement among racially diverse youth in social justice-oriented tobacco control initiatives that promote equity. A study examining critical consciousness in emerging adults aimed to explore the role of critical action in the relationship between interpersonal discrimination and tobacco use (Moreno et al., 2024). The results suggested that the link between interpersonal ethnic-racial discrimination and tobacco was moderated by critical action (or the CC scale). Specifically, interpersonal ethnic-racial discrimination was associated with high tobacco use among students with low levels of CC. However, when students had high levels of critical action, the relationship between interpersonal ethnic-racial discrimination and tobacco use was moderated protectively.

Current Study

Past research has highlighted the relationship between access to tobacco products and tobacco use, mainly in adolescents. Although there is salient research on diverse adolescents, there is a more nuanced understanding of Latinx college student tobacco use and its influences. CC has been suggested as a protective factor against tobacco product use when examining systematic influences like discrimination. Therefore, the current study seeks to examine the relationship between perceived access of in-person and online TR and tobacco product use among Latinx college students, with the moderating role of CC. Overall, this study aims to understand the nuanced relationship between access and tobacco product use in Latinx college students and how to support them for a healthier lifestyle. It is anticipated that Latinx college students who perceive easy access to tobacco products will be more likely to use them.

Additionally, it is anticipated that high levels of CC will moderate the relationship between perceived access and tobacco product use.

Methods and Materials

Participants and Procedures

Participants were recruited from California Central Valley community colleges and institutions, all of which qualified as Hispanic-Serving Institutions (HSI). The sample consisted of 348 self-identifying Latinx college students (71.7% female; *Mage*=19.64). A majority of the participants were U.S.-born (96.7%). Prior to the data collection, the study was approved by the second author's internal review board. The study consisted of an online survey available to Latinx-identifying college students via Qualtrics. Participants received a \$20 Amazon gift card upon completion of the survey. Before participating, participants were provided with information related to the study and then gave their consent.

Materials

Tobacco Product Proximity and Use

The National Youth Tobacco Survey (NYTS; CDC) is a 2023 questionnaire containing 149 items that examines youth tobacco product use patterns and beliefs. Specifically, the survey focuses on e-cigarettes (e.g., JUUL, Elf Bar), combustible cigarettes, cigars, hookah, smokeless tobacco (e.g., dip, snuff), nicotine pouches (e.g., ZYN, VELO), heated tobacco products (e.g., IQOS), and other oral nicotine products (e.g., lozenges, gum). Although the survey includes multiple subscales, the present study focused on past-30-day use frequency (e.g., "During the past 30 days, on how many days did you use [product]?"), perceived access (e.g., "How easy do you think it is for people your age to buy tobacco products in a store?"). Response options for

frequency typically ranged from 0 (0 days) to a continuous fill-in scale (0-30 days). Due to the survey being a questionnaire, no reliability testing was conducted.

Critical Consciousness

The Short Critical Consciousness Scale (Rapa et al., 2020) is a brief measure of adolescent sociopolitical development and CC. The scale consists of two subscales that focus on critical reflection and critical action. The critical reflection subscale assesses perceived inequality and egalitarianism through items (e.g., “poor people have fewer chances to get ahead”) rated on a 6-point Likert-type scale ranging from 1 (strongly disagree) to 6 (strongly agree). Critical action measures the frequency of engagement in sociopolitical behaviors (e.g., activism, community involvement; “participated in a civil rights group or organization”) using a 5-point Likert-type scale ranging from 1 (never did this) to 5 (at least once a week). Participants responded to a total of 14 items, with higher scores indicating greater levels of CC. Overall, the scale demonstrated acceptable reliability ($\alpha = .88$) and has been shown to have validity in diverse adolescent populations (Chan, 2024; Moreno et al., 2024).

Results

Descriptive Analyses

Frequency analysis was conducted to examine the past 30-day usage of tobacco products, including which specific products were used and how many times each product had been used in their lifetime. Frequency analyses revealed that a majority of participants ($n = 298$, 85.6%) had not consumed a tobacco product in the past 30 days, compared to those who had ($n = 50$, 14.4%). Frequency analyses also demonstrated that participants who do use tobacco products commonly use e-cigarettes ($n = 35$, 70%), cigarettes ($n = 8$, 16%), oral nicotine products ($n = 3$, 6%), cigars/cigarillos ($n = 2$, 4%), and snus ($n = 2$, 4%). Lastly, frequency analyses demonstrated that

approximately 125 (37.5%) of the participants reported having ever used a tobacco product in their lifetime.

A correlation analysis was conducted to examine the relationship between perceived proximity to in-person and online TR, tobacco product use, and critical consciousness. Correlation analyses indicated that perceptions of TR in person were positively correlated with perceptions of TR proximity online, if a person has ever used a tobacco product in their life (tobacco life use), and age. Perceptions of TR proximity online were positively correlated with CC attitudes, age, and negatively correlated with identifying as a woman. Past 30 day past 30-day tobacco product use was positively correlated with tobacco product life use. CC attitudes were positively correlated with CC behaviors and age. Lastly, CC behaviors were positively correlated with identifying as a woman (see Table 1).

Table 1

Main and Interaction Effects Examining the Relationship Between Perceptions of TR Proximity, Tobacco Use, and Critical Consciousness

Variable	1	2	3	4	5	6	7	8
1. Perceptions of TR Proximity_IP	—							
2. Perceptions of TR Proximity_O	.31**	—						
3. Past 30 Tobacco Use	.09	-.06	—					
4. Tobacco Life Use	.15**	-.04	.40**	—				
5. Critical Consciousness_ Attitudes	.07	.12*	.07	.06	—			
6. Critical Consciousness_ Behaviors	.02	.03	.07	.12*	.13*	—		
7. Age	.30**	.18**	.09	.30**	.10	.06	—	
8. Women	.06	-.13*	.01	-.03	.05	.10*	-.08	—

Note. $n=348$ * indicates $p<.05$; ** indicates $p<.01$. Perceptions of TR Proximity_IP refers to perceptions of in person tobacco retailer proximity. Perceptions of TR Proximity_O refers to perceptions of online tobacco retailer proximity.

Examination of the Associations Between TR Proximity, Tobacco Product Use, and the Moderating Role of Critical Consciousness

A regression analysis was conducted to examine associations between perceptions of TR proximity and past 30-day tobacco product use. Regression analyses demonstrated a significant negative association with perceptions of online TR proximity/availability. A moderating regression analysis was conducted to examine the moderating role of critical consciousness. When examining the moderating role of critical consciousness, no significant associations were found. Perceptions of online TR proximity/availability were negatively associated with past 30-day tobacco product use in all models (see Table 2).

Table 2

Interaction Effects Examining the Associations Between Perceptions of TR Proximity, Tobacco Use, and Critical Consciousness

	Past 30 Tobacco Use											
	<i>b</i>	<i>SE</i>	β	<i>p</i>	<i>b</i>	<i>SE</i>	β	<i>p</i>	<i>b</i>	<i>SE</i>	β	<i>p</i>
Perceptions of TR Proximity_IP	.10	.11	.07	.38	.10	.13	.08	.34	.11	.13	.08	.40
Perceptions of TR Proximity_O	-.30	.12	-.20	.01	-.30	.12	-.20	.02	-.29	.13	-.20	.02
Age	.02	.02	.08	.32	.02	.03	.08	.34	.02	.02	.08	.33
Women	-.02	.12	-.01	.89	-.02	.13	-.01	.87	-.01	.13	-.01	.93
CC_B	.08	.69	.01	.90	.13	.72	.02	.85	.09	.71	.01	.90
CC_A	.60	.34	.15	.08	.60	.34	.15	.07	.62	.36	.15	.08
Perceptions of TR Proximity_IP X CC_B					.03	.22	.01	.91				
Perceptions of TR Proximity_IP X CC_A					.03	.12	.02	.79				
Perceptions of TR Proximity_O X CC_B									.17	.26	.05	.52
Perceptions of TR Proximity_O X CC_A									.02	.12	.01	.88
Model Statistics	F (4, 160)=1.82, <i>p</i> =.12; R ² =.04				F (6, 146)=1.15, <i>p</i> =.34; R ² =.05				F (6, 146)=1.21, <i>p</i> =.30; R ² =.05			

Note. *n*=348. Perceptions of TR Proximity_IP = perceptions of in person tobacco retailer proximity. Perceptions of TR Proximity_O = perceptions of online tobacco retailer proximity. CC_B = critical consciousness behaviors. CC_A = critical conscious attitudes. X= interaction between variables.

An additional regression analysis was conducted to examine the associations between perceptions of TR proximity/accessibility and tobacco product life use. Regression analyses

indicated that perceived in-person TR proximity and age were associated with tobacco life use. Additionally, perceptions of online TR accessibility were negatively associated with tobacco product life use. A moderated regression analysis was conducted to see the moderating role of critical consciousness. There were no significant moderating associations by critical consciousness. Perceptions of TR in person and online, as well as age, were significant in all models (see Table 3).

Table 3

Interaction Effects Examining the Associations Between Perceptions of TR Proximity, Tobacco Use, and Critical Consciousness

	Tobacco Life Use											
	<i>b</i>	<i>SE</i>	β	<i>p</i>	<i>b</i>	<i>SE</i>	β	<i>p</i>	<i>b</i>	<i>SE</i>	β	<i>p</i>
Perceptions of TR Proximity_IP	.04	.02	.17	.04	.04	.02	.17	.04	.04	.02	.17	.05
Perceptions of TR Proximity_O	-.06	.02	-.20	.01	-.07	.02	-.25	.00	-.07	.02	-.25	.00
Age	.01	.00	.23	.00	.01	.00	.28	.00	.01	.00	.27	.00
Women	-.03	.02	-.12	.14	-.01	.02	-.03	.68	-.02	.00	.27	.49
CC_B	.00	.02	.02	.82	.01	.02	.03	.70	.00	.02	.01	.94
CC_A	-.00	.01	-.03	.69	.00	.01	.02	.80	.00	.01	.01	.93
Perceptions of TR Proximity_IP X CC_B					-.03	.04	-.06	.44				
Perceptions of TR Proximity_IP X CC_A					-.03	.02	-.12	.17				
Perceptions of TR Proximity_O X CC_B									-.06	.04	-.11	.14
Perceptions of TR Proximity_O X CC_A									.00	.02	.01	.93
Model Statistics	F (4, 160) = 5.76, $p < .001$; $R^2 = .13$				F (6, 146) = 4.53, $p < .001$; $R^2 = .16$				F (6, 146) = 4.43, $p < .001$; $R^2 = .15$			

Note. $n = 348$. Perceptions of TR Proximity_IP = perceptions of in person tobacco retailer proximity. Perceptions of TR Proximity_O = perceptions of online tobacco retailer proximity. CC_B = critical consciousness behaviors. CC_A = critical conscious attitudes. X = interaction between variables.

Discussion and Future Directions

The current study sought to examine the relationship between perceived TR proximity/accessibility (i.e., online, in-person) and tobacco product use (i.e., past 30-day and lifetime use), while also assessing the moderating role of critical consciousness (i.e., attitudes, behaviors). The findings contribute to the limited literature examining Latinx college students'

tobacco product use and accessibility and the intersection of potential protective/risk roles that critical consciousness may have.

TR Accessibility and Tobacco Product Use

It was anticipated that perceived proximity/accessibility to TR (i.e., online, in-person) would be associated with tobacco product use. This hypothesis was partially supported.

Perceptions of in-person TR accessibility had a positive relationship with participants who had ever used a tobacco product, but not for individuals who used within the past 30 days.

Perceptions of online TR accessibility were not significantly related to life or past 30-day tobacco product use. Additionally, perceptions of in-person TR were associated with tobacco product life use, but not for past 30-day use. Previous literature has identified common reasons for tobacco product use (or life use), including repeated peer exposure or socialization, product availability, perceptions of managing mental health, and belief in safe recreational tobacco product use (Nguyen et al., 2024; Sandhu et al., 2023). When examining past 30-day use, social relationships or peer exposure may be more salient than proximal distance or accessibility to TR. Paired with peer influence, skepticism of sparse usage of tobacco products, and perceptions of managing mental health, they may have further influences on past 30-day use, which this study did not examine.

Unexpectedly, perceptions of online TR accessibility were negatively associated with past 30-day and life use of tobacco products. Literature examining online TR has noted a lack of age verification and FDA compliance for tobacco products, especially e-cigarettes (Apollonio et al., 2025), suggesting ease of accessibility to minors. Although it may be easy to obtain tobacco products online, the packaging of products may not be discreet, and potentially alert household members to tobacco product usage, especially considering the average age of our participants is

under the legal age of tobacco product use. Additionally, due to online TR regularly violating FDA regulations (Apollonio et al., 2025), participants may not feel comfortable purchasing products they deem as “unsafe” or “fake”. Furthermore, previous literature has emphasized the influence of peer socialization, which online TR may not provide.

The Moderating Influence of Critical Consciousness

It was anticipated that CC would moderate the relationship between perceived TR accessibility and tobacco product use, buffering that relationship. This hypothesis was not supported because CC was not a significant moderator. Interestingly, CC behaviors were positively related to lifetime tobacco product use. Literature examining CC has suggested that an early understanding of CC can be a protective factor against systemic issues, which can help alleviate feelings of emotional distress (Chan, 2024; Morena et al., 2024). Although CC as a whole may be deemed protective, it is essential to note that CC behaviors (i.e., speaking out against injustices, attending protests, organizing collective action) can sometimes elicit negative interactions. For instance, a major social issue is the topic of immigration, and considering our participants to be of Latinx origin, it may be mentally and emotionally exhausting to participate in CC behaviors that are central to our participants' identities. Additionally, participating in CC behaviors may also bring a sense of community, and it could be that smoking could be a communal activity.

Limitations and Future Directions

Although the current study provides insights into the accessibility and use of tobacco products, with the moderating role of critical consciousness among Latinx college students, several limitations should be addressed. First, the cross-sectional nature of the study limits causal interpretations. Therefore, future research should employ a longitudinal design to investigate

how accessibility, use, and critical consciousness evolve over time. Second, although this study examined perceived accessibility, it may be more beneficial to utilize a program similar to ArcGIS, which can provide information on accurate proximity to TRs. Third, many of our participants were under the legal age of tobacco product purchase and use, which may have contributed to the lack of tobacco product use in our participants. Due to this, the variable of past-30-day use was not as strong, which led to non-significant regression models. Future research should examine participants who are above the legal age to see if the results would change.

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