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Miami, Florida

FACTORS ASSOCIATED WITH HIV TESTING BEHAVIORS AMONG LATINO EMERGING ADULTS

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DEDICATION

To my parents for always encouraging me to aim high despite the challenges that came our way.

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ABSTRACT OF THE DISSERTATION

FACTORS ASSOCIATED WITH HIV TESTING BEHAVIORS AMONG LATINO EMERGING ADULTS

by

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Florida International University, 2020

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Latino emerging adults account for a significant proportion of incident HIV cases among emerging adults aged 18-24 in the United States, but have a lower prevalence of HIV testing compared to other racial/ethnic emerging adult groups. Yet, factors that influence HIV testing behaviors among Latino emerging adults are poorly understood. This dissertation examined sociocultural and psychological factors of HIV testing behaviors among a sample of 157 sexually active Latino emerging adults aged 18 to 25. Cross-sectional data from the Project on Health among Emerging Adult Latinos (Project HEAL) were used. Robust Poisson regressions were used to estimate adjusted prevalence ratios (aPRs) and hierarchical logistic regressions were used to estimate adjusted odds ratios (aORs) for HIV testing behaviors.

Findings indicated that 59.9% of participants reported lifetime history of HIV testing. Of those engaging in sexual risk behaviors, 62.8% reported lifetime history of HIV testing. Familism support was significantly associated with lifetime history of HIV testing (aPR= .81, 95% confidence interval [CI]: .68-.95). Nativity status but not gender

moderated the association between familism support and lifetime history of HIV testing. Also, self-efficacy for HIV testing was significantly associated with lifetime history of HIV testing (aOR=3.49, 95% CI: 1.78-6.83), and this association was moderated by distress tolerance and sexual risk behaviors. Lastly, cognitive reappraisal was significantly associated with HIV testing intentions (aOR=1.44, 95%CI=1.04-1.99), and this association was moderated by gender.

Collectively, our findings highlight the significance of sociocultural and psychological factors that are associated with HIV testing behaviors and may have the potential to inform evidence-based prevention programs that promote HIV testing among Latino emerging adults. Future research should examine the direction of these potential casual associations to better inform HIV testing efforts.

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ABBREVIATIONS AND ACRONYMS

HIV	Human Immunodeficiency Virus
AIDS	Acquired Immunodeficiency Syndrome
U.S.	United States
MSM	Men Who Have Sex With Men
HLR	Hierarchical Logistic Regression
aPR	Adjusted Prevalence Ratio
aOR	Adjusted Odds Ratio
CI	Confidence Interval
CDC	Centers for Disease Control and Prevention
SE	Self-efficacy
DT	Distress Tolerance
SRBs	Sexual Risk Behaviors

Introduction

The human immunodeficiency virus (HIV) epidemic in the United States (U.S.) disproportionately affects young adults and racial/ethnic minorities, including Latinos and non-Latino Blacks. In 2017, young people under the age of 24 accounted for 21% of all 38,739 new HIV diagnoses in the U.S., with those aged 20 to 24 years having the second highest rate of HIV diagnoses (CDC, 2019a). Latinos represented 23.9% of new HIV diagnoses among emerging adults aged 18-24 in 2017, and had the second highest rate of new HIV diagnoses after non-Latino Black emerging adults (CDC, 2019a). Overall, young Latinos are at an increased risk of acquiring HIV as a result of increased engagement in unprotected sex and substance use (Copen, 2017; Deardorff et al., 2013; Stone, Becker, Huber, & Catalano, 2012). This increased risk for HIV among young Latinos is particularly alarming given that they are one of the largest and fastest-growing youth populations in the U.S. (Hugo Lopez, Krogstad, & Flores, 2018).

The National HIV/AIDS Strategy for the U.S. has identified addressing disparities in HIV incidence among groups most affected by HIV (e.g., Latinos and young adults) as an important priority to end the HIV epidemic. However, a major barrier to preventing new HIV cases is the high prevalence of undiagnosed HIV cases among these groups. Undiagnosed HIV cases are a primary driver of new HIV transmissions as it is estimated that more than 50% of new HIV cases come from people unaware of their HIV status (Marks, Crepaz, & Janssen, 2006). Unfortunately, Latinos and young people under the age of 24 are the groups with the highest prevalence of undiagnosed HIV cases in any

racial/ethnic- and age-group in the U.S. (16.5% and 44.0%, respectively) (CDC, 2018, 2019b).

HIV testing remains low among Latino emerging adults (Van Handel, Kann, O'Malley Olsen, & Dietz, 2016). Compared to non-Latino Black emerging adults, both female and male Latino emerging adults have a lower prevalence of HIV testing (Latino males: 26.8%, Latino females: 46.5%; non-Latino Black males: 45.3%, non-Latino Black females: 59.9%) (Van Handel et al., 2016). The lower prevalence of HIV testing among Latino emerging adults is a likely contributor to the high prevalence of undiagnosed HIV cases among Latinos and young people under the age of 24.

Furthermore, Latinos are more likely to be diagnosed late with HIV (as measured by a diagnosis of AIDS within one year of an HIV diagnosis) as compared to non-Latino Blacks and Whites (CDC, 2009). Late diagnosis reflects missed opportunities for early testing and linkage to HIV treatment. Receiving early treatment with antiretroviral therapy significantly decreases the risk of HIV transmission and improves survival (Antiretroviral Therapy Cohort Collaboration, 2017; Cohen et al., 2011; Rodger et al., 2019). Therefore, scaling up HIV testing among Latino emerging adults is critical to decreasing undiagnosed HIV cases and preventing HIV transmissions.

While HIV testing disparities among Latino emerging adults are well known, there is a dearth of research examining factors influencing HIV testing behaviors in this population. Some factors that have been found to influence HIV testing among non-Latino Black emerging adults and racially diverse samples of emerging adults in the U.S. include sociodemographic factors (e.g., age, gender, sexual orientation) (Alang &

Bornstein, 2018; Moore, Javier, Abrams, McGann, & Belgrave, 2017), HIV risk behaviors (e.g., number of sexual partners, unprotected sex) (Caldeira, Singer, O'Grady, Vincent, & Arria, 2012; Longmore, Johnson, Manning, & Giordano, 2013), and beliefs, attitudes and knowledge (e.g., perceptions of HIV stigma and HIV risk, attitudes toward HIV testing, HIV knowledge) (Lin, Roy, Dam, & Coman, 2017; Moore, 2013; Moore & Belgrave, 2019; Sabato, Burnett, Kerr, & Wagner, 2013). Although findings of the above-mentioned research studies may assist in developing HIV testing strategies for Latino emerging adults, it is important to understanding the specific factors that may influence this group decision to test as Latinos have unique cultural values, health beliefs, and histories that influence health behaviors and responses to interventions (Mitrani, 2009; Velasco-Mondragon, Jimenez, Palladino-Davis, Davis, & Escamilla-Cejudo, 2016). This information is vital to successfully reaching Latino emerging adults with appropriate health messages, campaigns, and prevention strategies that aim to increase and promote HIV testing in this population.

The overall objective of this dissertation was to examine the prevalence and sociocultural and psychological influences of HIV testing behaviors among a sample of 157 sexually active Latino emerging adults aged 18 to 25. The first study aimed to examine the association between familism support and lifetime history of HIV testing, and whether this association differed by nativity status and gender. The second study further examined the association between self-efficacy for HIV testing, distress tolerance and lifetime history of HIV testing, and tested the moderating effect of distress tolerance and sexual risk behaviors on the association between self-efficacy for HIV testing and

lifetime history of HIV testing. The third study examined the association between cognitive reappraisal and HIV testing intentions and whether this association differed by gender.

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MANUSCRIPT 1

HIV Testing among Latino Emerging Adults: Examining Associations with Familism, Nativity, and Gender

Abstract

Introduction: Low uptake of HIV testing among Latino emerging adults is an under-studied public health problem. Thus, it is important to identify factors influencing HIV testing behaviors in this population. This study examined the association between familism support and HIV testing among Latino emerging adults, and whether nativity status and gender moderated this association.

Methods: A cross-sectional online survey of 157 Latino emerging adults aged 18-25 years living in Arizona and Florida was conducted and data were analyzed using robust Poisson regression models.

Results: Results indicated that 59.9% of participants had ever been tested for HIV. Higher familism support was associated with a decreased prevalence of having ever been tested for HIV (aPR= .81, 95% CI: .68-.95, p=.012). Nativity status moderated the association between familism support and HIV testing, with this negative association, only found among immigrants. Gender did not moderate this association.

Discussion: Familism support plays a role in HIV testing behaviors, and thus should be considered when developing and tailoring programs to increase HIV testing among Latinos.

Keywords: HIV testing, familism, Latino/a, emerging adults

Introduction

Latino emerging adults aged 18-24 bear a disproportionate share of the human immunodeficiency virus (HIV) epidemic in the United States (U.S.), representing 23.3% of new HIV diagnoses in this age group (CDC, 2018a). After non-Latino Blacks, Latinos had the second highest rates of new HIV diagnoses among emerging adults in 2016 (CDC, 2018a). In addition, among emerging adults, Latinos are at especially high risk for engaging in unprotected sex and substance use, both increasing their risk of acquiring HIV (Copen, 2017; Deardorff et al., 2013; Stone, Becker, Huber, & Catalano, 2012).

Latinos in the U.S. have the highest percentage of undiagnosed HIV infections among all racial/ethnic groups (16.5%) and are more likely to test late for HIV infection (CDC, 2018b; Dennis, Napravnik, Seña, & Eron, 2011). In addition, an estimated 44% of young people aged 13-24 are unaware of their HIV status (CDC, 2019c). These high percentages of undiagnosed HIV infections among Latinos and young people are pertinent to Latino emerging adults as this group has high rates of HIV diagnoses and a lower prevalence of HIV testing (CDC, 2018a; Van Handel, Kann, O'Malley Olsen, & Dietz, 2016). Both female and male Latino emerging adults have a low HIV testing prevalence (males: 26.8%, females: 46.5%) compared to non-Latino Black emerging adults (males: 45.3%, females: 59.9%), the two groups driving the HIV epidemic in the U.S. (Van Handel et al., 2016). Thus, increasing the uptake of HIV testing among Latino emerging adults is critical to increase the number of people aware of their HIV status and linked to HIV care.

Familism and HIV Testing

Familism is a salient cultural value among Latinos and reflects the importance of family. The behavioral process model of familism (BPMF) proposes that familism reflects a set of beliefs about the behavioral standards of family members that drive familism-consistent behaviors among youth (Hernández & Bámaca-Colbert, 2016). Latino youth who endorse high levels of familism values are more likely to adjust their behaviors to reflect their family values (Hernández & Bámaca-Colbert, 2016). As a result, they engage more in prosocial and less in risk behaviors to not compromise their family values and maintain close relationships (Hernández & Bámaca-Colbert, 2016).

Familism has been found to be negatively associated with HIV testing behaviors among Latinos (Ma & Malcolm, 2016; Solorio, Forehand, & Simoni, 2013). A recent study on Latino adolescents aged 13-16 found that those who endorsed higher familism values were less likely to have had an HIV test (Ma & Malcolm, 2016). Another qualitative study among young Latino men who have sex with men (MSM) found that familism was reported as a barrier to HIV testing due to fear of facing negative attitudes from family towards seeking HIV testing (Solorio et al., 2013).

While previous studies have examined the role of familism on HIV testing among young Latinos, none has examined specific components of familism (e.g., familism support) as separate determinants of HIV testing behaviors in this population. One important component of familism is the perception of the family as the primary source of social support (Sabogal, Marín, Otero-Sabogal, Marín, & Perez-Stable, 1987). This perception of family support is high among Latinos (Almeida, Molnar, Kawachi, &

Subramanian, 2009). Latinos believe that issues can be solved with the help of family members and that support can always be found within familial networks more than from external networks (Sabogal et al., 1987). This sense of family support and close relationships emphasized by familism may be protective for health and health behaviors (Alegría, Sribney, & Mulvaney-Day, 2007; Diaz & Niño, 2019; Perez & Cruess, 2014). However, in some instances such as when the behavior is stigmatized (e.g., HIV testing), people may feel hesitant to seek support from familial networks (Castro, Orozco, Aggleton, Eroza, & Hernández, 1998; Rivera-Díaz, Varas-Díaz, Padilla, & Vargas-Cancel, 2017).

Recent studies have demonstrated the protective effect of social support on HIV testing behaviors (Grosso, 2010; Painter et al., 2019; Scott et al., 2014). However, the influence of social support on HIV testing may differ by the source of support (Moodley & Kagee, 2019; Painter et al., 2019). For instance, seeking family support to getting tested for HIV may be ineffective as this behavior may be seemed negatively by family members. Among Latinos, HIV testing is highly stigmatized and is equated with sexual promiscuity and homosexuality (Solorio et al., 2013). Also, the act of getting tested for HIV may suggest that a person is infected with HIV. Thus, having to disclose one's sexual activity, sexual orientation, and potential HIV status when seeking support from family to getting tested for HIV may bring familial conflict (Ma & Malcolm, 2016). As a result, Latinos may decide not to seek support from family to getting tested for HIV. Thus, understanding the influence of familism support on HIV testing behaviors among Latinos is important.

Nativity, Gender, and Familism

Familism support may differ by nativity status and gender among Latinos. Foreign-born Latinos tend to have higher levels of familism support compared to their U.S. born counterparts (Almeida et al., 2009). These higher levels of familism support among foreign-born Latinos may be due to higher retention of cultural values and stronger orientation towards the family network as they adjust to their new environment (Almeida et al., 2009). Furthermore, familism values are socialized and encouraged more for females than for males in the Latino culture (Guilamo-Ramos, Bouris, Jaccard, Lesesne, & Ballan, 2009). Consequently, females have closer relationships with their families and are urged to meet family expectations for gender roles (Guilamo-Ramos et al., 2009; Hernández & Bámaca-Colbert, 2016). Considering this information, it would be important to examine whether the association between familism support and lifetime history of HIV testing is moderated by nativity status and gender.

Present Study

The objective of this study was to examine the association between familism support and HIV testing behaviors among Latino emerging adults. Emerging adulthood is a distinct developmental stage characterized by greater autonomy in decision making and independence from the family network (Fuligni & Pedersen, 2002). As emerging adults become more independent and autonomous, they may adhere less to familism values and seek less support from familial networks (Hernández & Bámaca-Colbert, 2016). This, in turn, may modify the extent to which emerging adults' behaviors reflect their adherence to familism values. Therefore, it is particularly important to examine whether familism

support acts as a barrier to HIV testing behaviors among Latinos during emerging adulthood.

Accordingly, the primary aims of this study were to (1) examine the association between familism support and HIV testing, and (2) examine the extent to which nativity status and gender moderate the association between familism support and HIV testing among Latino emerging adults. We hypothesize that (1) higher levels of familism support would be negatively associated with lifetime history of HIV testing and (2) the association between familism support and lifetime history of HIV testing would be moderated by nativity status and gender in such a way that the association would be stronger for immigrants than U.S.-born, and for females than males.

Methods

Participants and Data Collection

The present study used cross-sectional data from the *Project on Health among Emerging Adult Latinos* (Project HEAL). Project HEAL was designed to examine psychological, social and cultural influences on alcohol and nicotine use behaviors, mental health, sexual behaviors among Latino emerging adults. A convenience sample of 200 participants was obtained using quota sampling to ensure a proportional distribution of gender and college student status. Participants were 1) Latino/Hispanic, 2) between 18 to 25 years of age, 3) currently living in Maricopa County, Arizona or Miami-Dade County, Florida, and 4) able to read English.

Participants were enrolled from August 2018 to February 2019 to complete a confidential online survey administered via Qualtrics. Recruitment methods included

online platforms (i.e., Facebook), listservs, flyers, and word-of-mouth. Also, most non-college participants at each study site were recruited in-person by research personnel from the FIU Center for Research on U.S. Latino HIV/AIDS and Drug Abuse (CRUSADA) and the Arizona State University Southwest Interdisciplinary Research, with experience in recruiting Latino participants for research studies. Prospective participants interested in the study contacted a member of Project HEAL by email and were screened to determine their eligibility to enroll in the study. All eligible participants were emailed a unique Internet link to complete the online survey. Informed consent was provided by participants prior to completing the survey using an electronic informed consent form. Participants were informed that all their responses were voluntary and confidential, and that they could stop completing the survey at any time and refuse to answer any questions that might make them feel uncomfortable. Also, participants were advised to complete the survey in a private place to prevent loss of confidentiality. The online survey took approximately 50 minutes to be completed and participants received a $30 Amazon e-gift card as an incentive. The study was approved by the Institutional Review Board of Florida International University.

Measures

Lifetime history of HIV testing was assessed using the following question "Have you ever been tested for HIV, the virus that causes AIDS? (Do not count tests done if you donated blood) (CDC, 2017). Responses included 1=*yes and* 0=*no.*

Familism support was measured using the six-item *familism support* sub-scale of the Mexican American Cultural Values Scale (MACVS) (Knight et al., 2010), which

includes statements such as “family provides a sense of security because they will always be there for you.” Responses were rated on a 5-point scale ranging from *not at all* (1) to *completely* (5). Items were averaged with higher scores indicating stronger familism support. Cronbach's reliability coefficient for this measure was α= .91. This measure has been used in previous studies with Mexican and non-Mexican samples and has demonstrated adequate reliability (Knight et al., 2010; Villalobos & Smetana, 2012).

Covariates

HIV stigma was measured using the three-item stigma sub-scale *concerns with public attitudes* developed by Reinius et al., 2017 (Reinius et al., 2017). Items were rated on a 4-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (4). Items were summed with higher scores indicating a higher level of HIV-related stigma (α=.85). This variable was included in this study because HIV stigma within the family context has been found to influence HIV testing behaviors among Latinos (Solorio et al., 2013).

Number of sexual partners was assessed with the item “In the past 3 months, with how many people did you have sexual intercourse (this includes vaginal and/or anal sex)?”. Responses included 1=*I have never had sexual intercourse*, 2=*I have had sexual intercourse, but not during the past 3 months*, 3=*1 person*, 4=*2 people,* 5=*3 people,* 6=*4 people,* 7=*5 people,* 8=*6 or more people* (CDC, 2017). Responses were categorized as 1=*no recent sexual partners*, 2=*1 or 2 sexual partners*, and 3=*3 or more sexual partners*.

Unprotected sex was assessed using the following two questions: “In the past 3 months, did you use a condom every time you had vaginal and/or anal sex with your primary partner (someone with whom you feel the most committed such as

boyfriend/girlfriend, spouse, significant other, or life partner)?" and "In the past 3 months, did you use a condom every time you had vaginal and/or anal sex with a casual partner (someone with whom you do not feel committed to or know very well)?." Participants were classified as having unprotected sex in the past 3 months (coded as 1=*yes* and 0=*no*) if they responded "no" to any of these questions.

Sociodemographic variables included age, gender (0=*male*, 1=*female*), partner status (0=*single*, 1=*has a partner*), sexual minority status (0=*heterosexual*, 1=*sexual minority*), nativity status (0=*immigrant*, 1=*U.S. born*), Latino subethnicity (0=*Mexican*, 1=*Cuban*, 2=*Colombian*, 3=*Non-Colombian South American*, 4=*Central American*, 5=*Other Latino*), college student status (0=*No*, 1=*Yes*), education level (0=*no bachelor's degree*, 1=*completed bachelor's degree or higher*), employment status (0=*unemployed*, 1=*employed*), financial strain (1=*has more money than needed*, 2=*just enough money for needs*, 3=*not enough money to meet needs),* health insurance (0=*not insured*, 1=*insured*), and study site (0=*Maricopa County, Arizona*, 1=*Miami-Dade County, Florida*).

Analysis

Descriptive analyses were conducted for each independent variable by lifetime history of HIV testing. Frequencies and proportions were reported for categorical variables and means and standard deviations for continuous variables. Poisson regression models with robust estimates of variance were used to estimate unadjusted and adjusted prevalence ratios (aPRs) and 95% confidence intervals (CIs) for lifetime history of HIV testing (Deddens & Petersen, 2008; Petersen & Deddens, 2008), instead of log-binomial regression model due to lack of convergence. We used prevalence ratios instead of odds

ratios because the prevalence of lifetime history of HIV testing was high (>10%), and odds ratios tend to overestimate the strength of association when the outcome is common (Petersen & Deddens, 2008). Bivariate analyses were first conducted and independent variables with a significance level of <0.10 were included as covariates in the robust Poisson regression model. Sexual risk behaviors and HIV stigma are linked with HIV testing (Adebayo & Gonzalez-Guarda, 2017; Young & Zhu, 2012); thus, these variables were also included in the final model to reduce potential confounding effects. Two interaction terms (familism x nativity status; familism x gender) were added to the model and stratified models were estimated for interaction terms that were statistically significant. All data analyses were performed using SPSS V.25 and a statistical significance of <0.05 was used.

The final sample used for statistical analyses was 157 participants. A total of 43 participants were excluded because they either reported never having had sexual intercourse (41) or had a missing value on the questions about having had sexual intercourse or lifetime history of HIV testing (2). A post hoc power analysis was conducted using the software program G*Power (version 3.1.9.4) (Faul, Erdfelder, Lang, & Buchner, 2007). With a sample of 157, we can detect an effect size as small as 0.45 at 0.05 alpha level with 80% power (Faul et al., 2007).

Results

Descriptive Characteristics

The average age was 21.5 years (*SD*=2.04) and approximately half of the sample were females (*n*=81, 51.6%) (Table 1). The majority of participants were college students

(*n*=104, 66.2%) and born in the U.S. (*n*=108, 68.8%). Most participants identified as Mexican (*n*=75, 47.8%), Cuban (*n*=22, 14.0%), Colombian (*n*=19, 12.1%), non-Colombian South American (*n*=17, 10.8%), and Central American (*n*=13, 8.3%). Participants were currently living in Maricopa County, Arizona (*n*=83, 52.9%) and Miami Dade County, Florida (*n*=74, 47.1%). Of those living in Arizona, 88.0% (*n*=73) were of Mexican heritage whereas of those living in Florida 97.3% (*n*=72) were of non-Mexican heritage. Most participants identified as heterosexual (*n*=132, 84.1%) and reported having had 1 or 2 sexual partners in the past 3 months (*n*=106, 67.5%). About half of the participants reported having had unprotected sex in the past 3 months (*n*=77, 49.0%) and 59.9% (*n*=94) reported having ever been tested for HIV. Descriptive characteristics by lifetime history of HIV testing are found in Table 1.

Bivariate Analyses

Independent variables associated with lifetime history of HIV testing in the bivariate analyses were gender, partner status, sexual minority, Latino subethnicity, education level, study site, unprotected sex in the past 3 months, age, and familism support (p-value <0.10; Table 2).

Robust Poisson Regression

Only three predictor variables were statistically significant in the robust Poisson regression model: gender, sexual minority status and familism support (Table 2). Females had an increased prevalence of having ever been tested for HIV as compared to males (aPR=1.45, 95% CI: 1.09-1.95, *p*=.012). Sexual minority people had an increased prevalence of having ever been tested for HIV as compared to heterosexual people (aPR=

1.53, 95% CI: 1.10-2.13, *p*= .012). Also, a one-unit *increase* in familism support was associated with a .19 decrease in the prevalence of having ever been tested for HIV (aPR= .81, 95% CI: .68-.95, *p*=.012).

Moderation Analyses

The interaction term between familism support and nativity status was statistically significant (*p*=.004; Figure 1) but not the term between familism support and gender (*p*=.983). Stratified models were fitted to examine the association between familism support and lifetime history of HIV testing by nativity status. In the stratified model for immigrants, familism support was negatively associated with lifetime history of HIV testing. A one-unit increase in familism support was associated with a .54 decrease in the prevalence of having ever been tested for HIV (aPR=.46, 95% CI: .28-.74, *p*=.002). For U.S. born, familism support was not significantly associated with lifetime history of HIV testing (aPR=.93, 95% CI: .76-1.13, *p*=.455).

Discussion

Key findings of the present study are as follow. Our data supported the hypothesis that higher levels of familism support would be negatively associated with lifetime history of HIV testing. Our data also supported the hypothesis that the association between familism support and lifetime history of HIV testing would be moderated by nativity status. However, our data did not support the hypothesis of gender as a moderator.

Our finding regarding the negative association between familism support and lifetime history of HIV testing is consistent with a previous study that found this

association among Latino adolescents (Ma & Malcolm, 2016). One potential explanation for this finding is that Latino emerging adults with higher familism support are more likely to seek support from family networks, however, since testing for HIV is seen as a negative behavior they may feel hesitant to seeking support from family members to getting tested for HIV (Barrington et al., 2018). Additionally, exposing one's sexual behaviors may disrupt supportive relationships and bring conflict, and thus, may discourage seeking family support to get tested for HIV (Perez & Cruess, 2014). This finding is in line with previous studies showing that Latinos may encounter barriers to receiving social support from their ethnic and family networks due to negative responses towards stigmatized behaviors (e.g., same-sex sexual behaviors) (Perez & Cruess, 2014; Rhodes et al., 2011).

Receiving social support facilitates HIV testing and the utilization of prevention services (Lauby et al., 2012; Rouhani et al., 2017). Social support serves as a buffer against barriers to HIV testing and provides help to coping with negative psychological responses (e.g., fear, anxiety) to getting tested or finding out an HIV positive status (Scott et al., 2014). Since family support is the main source of social support among Latinos (Almeida et al., 2009), addressing familism support as a barrier to HIV testing is crucial. In fact, a previous study among Latinas showed the importance of familial support for seeking testing for HIV as many health decisions are made within the family context (Sudha, Morrison, & Gruber, 2017). Thus, familism support may be a potential source of support that can be utilized to promote HIV testing in this population.

As previously mentioned, emerging adults may adhere less to familism and seek less support from familial networks and thus their health behaviors and decisions may reflect lower familism values (Hernández & Bámaca-Colbert, 2016). However, it seems that for Latinos emerging adults, familism continues to have an influence on sexual health decisions during this developmental stage. Therefore, deterring HIV testing due to the endorsement of familism may increase the risk for negative sexual health outcomes in later adult years. Addressing familism as a barrier to HIV testing during emerging adulthood is important as during this stage individuals establish long-term behavioral patterns (Nelson, Story, Larson, Neumark-Sztainer, & Lytle, 2008).

Findings from the moderation analysis indicated that the association between familism support and HIV testing was specific to immigrants. An explanation underlying this finding is that foreign-born Latinos are more likely to adhere to familism values as compared to U.S. born Latinos, which reduces their likelihood of seeking family support for HIV testing (Almeida et al., 2009; Perez & Cruess, 2014). Foreign-born Latinos that immigrate to the U.S. tend to rely more on family support networks than their U.S. born counterparts as a way of coping with the new challenges and lack of resources (Almeida et al., 2009). This may not be crucial for U.S. born Latinos because they are more likely to utilize their extended social networks that may provide support for seeking HIV testing. Future studies should investigate the structure of social and familial networks that Latinos engage with and whether they exist post-immigration, and the support and communication dynamics related to HIV testing within these networks, to understand how to effectively use them to promote HIV testing (Barrington et al., 2018; Painter,

2018). It might also be important to examine how the effect of familism support on HIV testing among immigrants may differ by time living in the U.S., country of origin, and family socioeconomic status.

Unlike nativity status, gender did not moderate the association between familism support and HIV testing. The majority of the sample was U.S. born and thus more acculturated to the U.S. norms surrounding familism and HIV testing. Therefore, females in this study may be more acculturated and more likely to discard familism norms and seek support for HIV testing from social networks other than the family (Hernández & Bámaca-Colbert, 2016). For Latino males, familism norms are less socialized and acculturation may not have the same effect on changing these norms as for females (Hernández & Bámaca-Colbert, 2016). This may explain why the association between familism support and HIV testing did not differ for females and males.

Furthermore, we also found that gender and sexual minority were associated with lifetime history of HIV testing. Females had an increased prevalence of having ever been tested for HIV as compared to males. This finding is consistent with prior research among emerging adults (Caldeira, Singer, O'Grady, Vincent, & Arria, 2012). A potential explanation is that females may have more opportunities to be tested for HIV than males, as they receive HIV testing during routine gynecological and prenatal screenings as recommended by the CDC (CDC, 2019b). Considering that Latino males accounted for 22% of new HIV diagnoses in 2017, this finding points to the importance of continued outreach efforts to increase uptake of HIV testing among young Latino males (CDC, 2019a). However, both Latino females and males have significant barriers to HIV testing

including limited access to health care and preventive services and insufficient effective prevention strategies (Rao et al., 2016; Taveras et al., 2017). In this study, only 59.9% of participants reported having ever been tested for HIV. Thus, addressing both traditional and cultural barriers to HIV testing may help increase HIV testing uptake among young Latino females and males.

Similar to previous studies, sexual minority people had an increased prevalence of having ever been tested for HIV than heterosexuals (Alang & Bornstein, 2018). This finding may be partly explained by higher levels of concern about sexual history among sexual minorities groups and may reflect targeted efforts to increase HIV testing among sexual minorities (Alang & Bornstein, 2018).

The findings of this study underscore the importance of developing and evaluating health communication messages that target Latino emerging adults and their families (particularly immigrants) to promote and normalize HIV testing within families. Since seeking HIV testing may be associated with sexual promiscuity and homosexuality within Latino family networks (Solorio et al., 2013), it is important to develop and evaluate health communication messages that can be used to eliminate these misconceptions. Health messages that promote the importance of HIV testing for all people irrespective of risk factors for HIV infection (as recommended by the CDC), health benefits of getting tested for the individual and family, and seeking social support from a trusted friend (not only from the family) may help to reduce the impact of familism values on HIV testing behaviors among Latino emerging adults (Branson et al., 2006; Solorio, Norton-Shelpuk, Forehand, Martinez, & Aguirre, 2014).

Current HIV awareness campaigns targeting Latinos such as Doing It, Start Talking. Stop HIV., and Stop HIV Stigma (CDC, 2018c), may be enhanced by including health communication messages that specifically target Latino families to encourage talking about HIV testing and testing together as a family. This may help to change stigmatizing family dynamics, raise awareness and encourage communication about HIV testing, and enhance supportive relationships among family members with respect to seeking testing for HIV. For instance, an HIV prevention and testing program (*Protege tu Familia: Hazte la Prueba*) targeting Latino families through the delivery of guided conversations on HIV prevention by community health workers was effective in increasing discussion about sexual risk, reducing HIV stigma and increasing HIV testing intentions among families (Rios-Ellis et al., 2010).

Limitations

There are several limitations to this study. First, self-reported measures were used to collect data on behaviors, and thus susceptible to recall and social desirability biases. To reduce the potential of recall bias for some measures, participants were asked behavioral events for the past three months. Second, the generalizability of these findings may be limited as a non-probability sampling was used and most participants were U.S. born Latinos and college students. Also, the survey was only offered in English which may have excluded potential Spanish monolingual or low-English proficiency participants. In addition, the online survey methodology may have excluded individuals without access to internet-based devices. However, nearly all young Latinos aged 18 to 29 (94%) have access to the internet (Brown, Lopez, & Hugo Lopez, 2016). Replicating

this study with a more diverse and representative sample of young Latinos is warranted. Third, HIV testing was measured as lifetime history, and thus testing could have occurred before immigrant participants came to the U.S. Fourth, this study relies on current reports of familism support to predict past behavior of HIV testing. Measuring familism support at the time of testing for HIV may provide a better understanding of the role of familism on HIV testing behaviors. Nonetheless, familism values remain highly important for Latinos throughout their lifetime (Dillon, De La Rosa, Sastre, & Ibañez, 2013). Lastly, only familism support was examined as a determinant of HIV testing in this study. Therefore, other components of familism should be examined in future studies (e.g., Familism Obligations, Familism Referents).

New Contribution to the Literature

This is the first study to examine the association between familism support and lifetime history of HIV testing among Latino emerging adults. This study advances our understanding of cultural influences on HIV testing behaviors among Latino emerging adults, a group with one of the highest risks of HIV in the U.S. Taken together with national priorities to address HIV disparities among Latinos and young adults, these findings suggest the critical need to develop strategies for increasing and promoting HIV testing for this group that incorporate cultural values of Latino families.

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Tables and Figures

Table 1. Characteristics of sexually active Latino emerging adults by lifetime history of HIV testing (n=157).

		Lifetime History of HIV Testing	
	Total (N=157)	**Yes** (N=94, 59.9%)	**No** (N=63, 40.1%)
Characteristic	**n (%)**	**n (%)**	**n (%)**
Gender			
Male	76 (48.4)	39 (51.3)	37 (48.7)
Female	81 (51.6)	55 (67.9)	26 (32.1)
Partner Status			
Single	102 (65.0)	55 (53.9)	47 (46.1)
Has partner	55 (35.0)	39 (70.9)	16 (29.1)
Sexual Minority Status			
Heterosexual	132 (84.1)	75 (56.8)	57 (43.2)
Sexual minority	25 (15.9)	19 (76.0)	6 (24.0)
Nativity Status			
Immigrant	49 (31.2)	25 (51.0)	24 (49.0)
U.S. born	108 (68.8)	69 (63.9)	39 (36.1)
Latino Subethnicity			
Mexican	75 (47.8)	51 (68.0)	24 (32.0)
Cuban	22 (14.0)	7 (31.8)	15 (68.2)
Colombian	19 (12.1)	12 (63.2)	7 (36.8)
Non-Colombian South American	17 (10.8)	10 (58.8)	7 (41.2)
Central American	13 (8.3)	6 (46.2)	7 (53.8)
Other Latino	11 (7.0)	8 (72.7)	3 (27.3)
College Student			
Yes	104 (66.2)	65 (62.5)	39 (37.5)
No	53 (33.8)	29 (54.7)	24 (45.3)
Education Level			
No bachelor's degree	116 (73.9)	61 (52.6)	55 (47.4)
Completed bachelor's degree or higher	41 (26.1)	33 (80.5)	8 (19.5)
Employment Status			
Employed	131 (83.4)	79 (60.3)	52 (39.7)
Unemployed	26 (16.6)	15 (57.7)	11 (42.3)
Financial Strain			
More money than needed	10 (6.4)	5 (50.0)	5 (50.0)
Just enough money for needs	88 (56.1)	49 (55.7)	39 (44.3)
Not enough money to meet needs	59 (37.6)	40 (67.8)	19 (32.2)

Health Insurance			
Yes	127 (80.9)	77 (60.6)	50 (39.4)
No	30 (19.1)	17 (56.7)	13 (43.3)
Study Site			
Miami-Dade County, Florida	74 (47.1)	38 (51.4)	36 (48.6)
Maricopa County, Arizona	83 (52.9)	56 (67.5)	27 (32.5)
Number of Sexual Partners in the Past 3 Months			
No recent sexual partners	21 (13.4)	12 (57.1)	9 (42.9)
1 or 2 sexual partners	106 (67.5)	67 (63.2)	39 (36.8)
3 or more sexual partners	27 (17.2)	15 (55.6)	12 (44.4)
Unprotected Sex in the Past 3 Months			
Yes	77 (49.0)	54 (70.1)	23 (29.9)
No	76 (48.4)	38 (50.0)	38 (50.0)
	M(SD)	**M(SD)**	**M(SD)**
Age	21.5 (2.04)	21.9 (1.92)	21.0 (2.13)
HIV Stigma	9.07 (1.88)	9.02 (1.98)	9.14 (1.75)
Familism Support	4.32 (0.67)	4.23 (0.67)	4.45 (0.66)

Table 2. Robust Poisson Regression Model Predicting Lifetime History of HIV Testing (n=151)

	Model 1				Model 2			
Variable	*B*	*SE*	*Unadjusted PR*	*95% CI*	*B*	*SE*	*Adjusted PR*	*95% CI*
Gender (Ref: Male)								
Female	.28	.14	1.32	1.02, 1.73*	.37	.15	1.45	1.09, 1.95**
Partner Status (Ref: Single)								
Has a partner	.27	.13	1.32	1.03, 1.68*	.07	.14	1.07	.82, 1.41
Sexual Minority (Ref: Heterosexual)								
Sexual minority	.29	.14	1.34	1.03, 1.75*	.43	.17	1.53	1.10, 2.13**
Nativity Status (Ref: Immigrant)[a]								
U.S. born	.23	.16	1.25	.92, 1.71	.07	.16	1.07	.79, 1.46
Latino Subethnicity (Ref: Mexican)								
Cuban	-.76	.32	.47	.25, .90*	-.64	.42	.53	.24, 1.20
Colombian	-.07	.19	.93	.64, 1.35	.25	.32	1.29	.69, 2.42
Non-Colombian South American	-.15	.22	.87	.56, 1.33	.11	.37	1.11	.54, 2.32
Central American	-.39	.31	.68	.37, 1.25	-.23	.32	.79	.42, 1.50
Other Latino	.07	.20	1.07	.72, 1.59	.003	.31	1.00	.54, 1.86
College Student (Ref: No)								
Yes	.13	.15	1.14	.86, 1.52	-	-	-	-
Education Level (Ref: No bachelor's degree)	.43	.12	1.53	1.22, 1.93*	.25	.15	1.28	.97, 1.71
Completed bachelor's degree or higher								
Employment Status (Ref: Unemployed)	.04	.18	1.05	.73, 1.49	-	-	-	-
Employed								
Financial Strain (Ref: More money than needed)	.11	.33	1.11	.58, 2.13	-	-	-	-
Just enough money for needs	.30	.33	1.36	.71, 2.58	-	-	-	-
Not enough money to meet needs								
Health Insurance (Ref: No)								
Yes	.07	.17	1.07	.76, 1.51	-	-	-	-
Study Site (Ref: Arizona)								

Florida	-.27	.14	.76	.58, .99*	-.07	.28	.94	.54, 1.62
Number of Sexual Partners in the Past 3 Months (Ref: No recent sexual partners) [b]	.10	.20	1.11	.74, 1.65	-.02	.21	.98	.64, 1.77
1 or 2 sexual partners	-.03	.26	.97	.59, 1.61	.06	.26	1.06	.65, 1.48
3 or more sexual partners								
Unprotected Sex in the past 3 months (Ref: No)	.34	.14	1.40	1.07, 1.83*	.23	.13	1.25	.97, 1.64
Yes								
Age	.08	.03	1.09	1.02, 1.16*	.05	.04	1.05	.97, 1.13
HIV Stigma[b]	-.01	.03	.99	.92, 1.05	-.03	.03	.97	.91 1.03
Familism Support	-.18	.09	.83	.70, .99*	-.22	.09	.81	.68, .95**

Notes:

Ref: Reference Group

[a] Although not statistically significant in the bivariate analysis, this variable was included in the model to test for moderation.

[b] Although not statistically significant in the bivariate analysis, this variable was included in the model to reduce potential confounding effects.

*p-value<0.10; **p-value<0.05

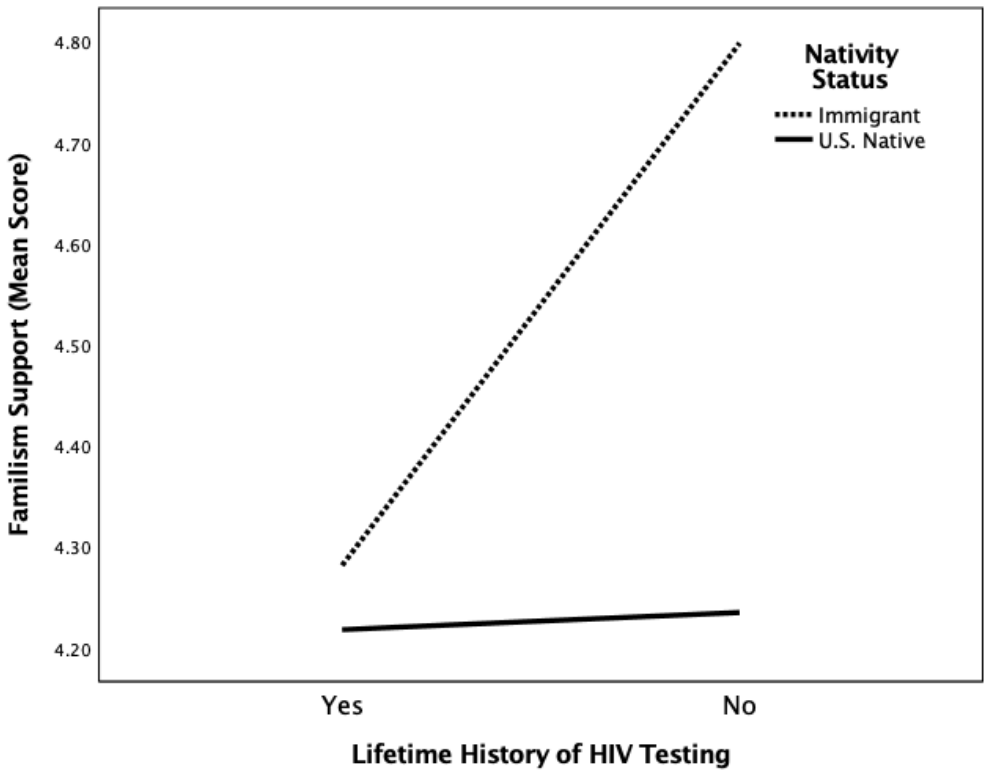

Figure 1. Moderation of the association of familism support and lifetime history of HIV testing at levels of nativity status.

MANUSCRIPT 2

Self-efficacy and HIV testing among Latino Emerging Adults: Examining the Moderating Effects of Distress Tolerance and Sexual Risk Behaviors

Abstract

Introduction: Latino emerging adults in the United States are at a high risk of HIV and have a low prevalence of HIV testing. This study examined the association between self-efficacy for HIV testing, distress tolerance and lifetime history of HIV testing, and tested the moderating effect of distress tolerance and sexual risk behaviors on the association between self-efficacy for HIV testing and lifetime history of HIV testing.

Methods: Data were collected from a cross-sectional sample of 157 sexually active Latino emerging adults aged 18-25 using an online survey and were analyzed using hierarchical logistic regression and moderation analyses.

Results: We found that 62.8% of those engaging in sexual risk behaviors had ever been tested for HIV. Self-efficacy for HIV testing was significantly associated with lifetime history of HIV testing (aOR=3.49, 95% CI: 1.78-6.83). There was a statistically significant three-way interaction among self-efficacy for HIV testing, distress tolerance and sexual risk behaviors (b=2.76, 95% CI: .52-5.00, p=.016). This interaction suggests that among those that reported any sexual risk behaviors, higher levels of self-efficacy were associated with lifetime history of HIV testing only at higher levels of distress tolerance.

Discussion: Further research is warranted to determine how self-efficacy for HIV testing and distress tolerance work together among high-risk groups to promote HIV testing.

Keywords: Latino/a, HIV testing, self-efficacy, distress tolerance, sexual risk behavior

Introduction

Latino emerging adults aged 18-24 in the United States (U.S.) are disproportionately impacted by the HIV epidemic. Latinos accounted for 23.3% of all new HIV diagnoses among emerging adults and had the second highest rate of new HIV diagnoses after non-Latino Blacks in 2016 (Centers for Disease Control and Prevention (CDC), 2018a). Despite this elevated HIV risk, Latino emerging adults have a low prevalence of HIV testing relative to non-Latino Black emerging adults (Van Handel, Kann, O'Malley Olsen, & Dietz, 2016). This is concerning as Latinos and young people under the age of 24 are the groups most likely to be unaware of their HIV status (16.5% and 44% respectively) (CDC, 2018b, 2019b). Therefore, increasing HIV testing among Latino emerging adults is important to increase the number of people aware of their HIV status, and to link this group to treatment promptly.

Self-Efficacy for HIV Testing

Understanding modifiable psychological factors that facilitate HIV testing, particularly among individuals at high risk, is crucial to increase HIV testing (de Wit and Adam, 2008). One psychological factor that may play a role in facilitating testing for HIV is *self-efficacy* (SE) for HIV testing -defined as a person's confidence in their ability to test for HIV (Evangeli, Pady, & Wroe, 2016; Pham et al., 2019; Prati et al., 2014; Zhao et al., 2018). It is suggested that individuals with high levels of SE are more likely to take

the necessary actions to engage in HIV prevention behaviors (Bandura, 1990). However, to date, no studies have examined the association between SE and HIV testing among Latino emerging adults or in any other stage of development.

Distress Tolerance

Another psychological factor that may influence HIV testing behaviors is *distress tolerance* (DT). DT is defined as the capacity to withstand and experience negative psychological distress (Simons and Gaher, 2005). Those individuals that have low DT tend to perceive distress as unbearable, cannot handle being distressed and tend to avoid or delay potentially distressing situations (Simons and Gaher, 2005). HIV testing may involve several stressors that can cause psychological distress including the uncertainty of an unknown HIV status or the potential negative consequences of getting a positive test or others finding out about being tested or test results (e.g., stigma, discrimination, rejection) (Adebayo and Gonzalez-Guarda, 2017; de Wit and Adam, 2008; Evangeli, et al., 2016). In fact, evidence from a recent study shows that psychological distress (e.g., worry) is common among people seeking HIV testing (Kagee, Saal, & Bantjes, 2017). As such, differential capacity for tolerating the psychological distress related to HIV testing may distinguish people who seek testing for HIV. However, DT has not been examined in relation to HIV testing.

Sexual Risk Behaviors

Individuals that engage in sexual risk behaviors (SRBs) are of particular importance for HIV testing interventions because they are more likely to contract HIV and if they are unaware of their HIV status, they will continue to unknowingly transmit HIV to others. In fact, 40% of ongoing HIV transmissions are from people unaware of

their HIV status (Gopalappa, Farnham, Chen, & Sansom, 2017). In addition, individuals that become aware of their HIV infection reduce their engagement in unprotected sex (Marks, Crepaz, & Janssen, 2006). Emerging adults reporting higher frequency of SRBs are more likely to get tested for HIV compared to those reporting lower frequency of SRBs (Caldeira, Singer, O'Grady, Vincent, & Arria, 2012). However, the prevalence of HIV testing is low among emerging adults engaging in high-risk HIV behaviors (Trepka and Kim, 2010). Therefore, understanding factors that facilitate HIV testing decisions among individuals engaging in SRBs are vital to effectively scale up HIV testing among those at a higher risk for HIV.

Accordingly, the aims of this study were to examine (1) the associations of SE and DT with lifetime history of HIV testing among Latino emerging adults and (2) test the moderating effect of DT and SRBs on the association between SE and lifetime history of HIV testing. We hypothesized that (a) higher SE for HIV testing would be associated with a higher likelihood of lifetime history of HIV testing, (b) higher DT would be associated with a higher likelihood of lifetime history of HIV testing, and (c) higher DT would strengthen the association between SE and lifetime history of HIV testing. Also, a three-way interaction among SE, DT and SRBs in relation to lifetime history of HIV testing were explored.

Methods

Participants and Procedures

Data for this study was obtained from the cross-sectional study *Project on Health among Emerging Adult Latinos* (Project HEAL). The sample included 200 Latino emerging adults; however, forty-one participants were excluded because they had not

initiated sexual debut and two had a missing value on questions about having had sexual intercourse or lifetime history of HIV testing. Therefore, the sample for the present study included 157 participants. Eligible participants had to be Latino/Hispanic, between 18 to 25 years of age, currently living in Maricopa County, Arizona or Miami Dade County, Florida, and able to read English. Participants were recruited through social media, listservs, flyers, and word-of-mouth. All participants were enrolled from August 2018 to February 2019 using a quota sampling. Individuals interested in the study contacted the research staff via email and were screened for eligibility, and those eligible were emailed an Internet link to complete the confidential survey and informed consent. The survey completion time was approximately 50 minutes and participants received a $30 Amazon e-gift card as compensation. The study was approved by the Institutional Review Board of Florida International University.

Measures

Lifetime History of HIV Testing was assessed using the following question "Have you ever been tested for HIV, the virus that causes AIDS? (Do not count tests done if you donated blood) (CDC, 2017).

Self-Efficacy for HIV testing was measured using two items: "I feel confident that I could get tested for HIV" and "I feel confident that I could locate a place where I can get tested for HIV" (Pham et al., 2017). Items were rated on a 4-point Likert scale ranging from strongly disagree (1) to strongly agree (4). Mean scores ranged from 1 to 4 and higher scores indicated higher SE for HIV testing. Cronbach's reliability coefficient was α=.69.

Distress Tolerance was measured using the three-item tolerance sub-scale from the Distress Tolerance Scale (e.g., "feeling distressed or upset is unbearable to me") (Simons and Gaher, 2005). Items were rated on a 5-point Likert scale strongly disagree (1) to strongly agree (5) and reverse scored. Mean scores ranged from 1 to 5 and higher scores represented higher tolerance for psychological distress. Cronbach's reliability coefficient was α=.83. The DT scale has been used in previous studies with emerging adult samples and has demonstrated good to excellent reliability (Beck, Ali, & Daughters, 2014; Iverson, Follette, Pistorello, & Fruzzetti, 2012).

Sexual Risk Behaviors. Participants were classified as engaging in SRBs if they self-reported having >1 sexual partners in the past 3 months, sex under the influence of alcohol or drugs in the past 3 months, and/or unprotected sex with primary and casual partner in the past 3 months.

Sociodemographic Variables included were age, gender, partner status, sexual minority status, nativity, college student status, education level, employment status, health insurance, study site, and financial strain.

Statistical Analysis

All data analyses were conducted using SPSS V.25. Frequencies and proportions for categorical variables and means and standard deviations for continuous variables were reported. Lifetime history of HIV testing was compared across all independent variables using independent sample t-tests and chi-square tests of association. Using a hierarchical logistic regression (HLR), variables were entered into the model in a specific order to determine the contribution of each group of predictors to the explained variance of the dependent variable (Block 1: sociodemographics, Block 2: SRBs, and Block 3: SE and

DT). Only those sociodemographic variables with a *p*-value<0.10 were included in the model along with SRBs, SE and DT. The statistical significance level was <0.05 and adjusted odds ratios (aOR) and 95% confidence intervals (CI) were reported.

Using PROCESS v3.3 for SPSS (Hayes, 2017), two moderation tests were conducted with 10,000 bootstraps to examine if DT and SRBs moderated the association between SE and lifetime history of HIV testing. Bootstrapping was used to calculate confidence intervals of conditional effects. The first moderation test examined the following two-way interaction in relation to lifetime history of HIV testing: SE x DT. The second moderation test examined the following three-way interaction in relation to lifetime history of HIV testing: SRBs x DT x SE (Figure 1). All moderation analyses were conducted controlling for sociodemographic variables included in the HLR model. Unstandardized regression coefficients and CIs were reported.

Results

The sample was comprised of 81 (51.6%) females and 76 males (48.4%) with an average age of 21.5 years (*SD*=2.04) (Table 1). Most participants were college students (*n*=104, 66.2%) and born in the U.S. (*n*=108, 68.8%). The majority identified as Mexican (*n*=75, 47.8%), Cuban (*n*=22, 14.0%), Colombian (*n*=19, 12.1%), non-Colombian South American (*n*=17, 10.8%), and Central American (*n*=13, 8.3%). Participants were living in Miami Dade County, Florida (*n*=74, 47.1%) and Maricopa County, Arizona (*n*=83, 52.9%). Of those participants living in Florida 97.3% (*n*=72) were of non-Mexican heritage and of those living in Arizona 88.0% (*n*=73) were of Mexican heritage.

Most participants identified as heterosexual (*n*=132, 84.1%). In terms of sexual risk behaviors in the past 3 months, 49.0% (*n*=77) reported having had unprotected sex,

36.9% (*n*=58) reported sex under the influence of alcohol or drugs, and 29.3% (*n*=46) reported >1 sexual partners. Only 59.9% (*n*=94) of participants reported having ever been tested for HIV and 62.8% (*n*=76) of those that reported engaging in any SRBs in the past 3 months had ever been tested for HIV.

Descriptive characteristics and results of t-tests and chi-square tests are found in Table 1.

Predictors of Lifetime History of HIV Testing

Results of the HLR indicated that 34.2% of the variance of lifetime history of HIV testing was explained by all predictor variables included in the model (Table 2). The first block included the sociodemographic variables and explained 20.3% of the variance of lifetime history of HIV testing [Nagelkerke R^2=20.3,$\chi^2(6)$=25.5, *p*=<.0005]. The second block included the SRBs variable which explained an additional 1% of the variance of lifetime history of HIV testing [Nagelkerke R^2=21.3,$\chi^2(7)$=26.9, *p*=<.0005]. The third block included the SE and DT which explained an additional 12.9% of the variance in lifetime history of HIV testing (Nagelkerke R^2=34.2,$\chi^2(9)$=45.8, *p*=<.0005). Of the nine predictor variables, only two were statistically significant in the final HLR model: gender and SE. The adjusted odds of having ever been tested for HIV was 3.14 times higher for females compared to males (aOR=3.14, 95%CI:1.41-7.02). Also, a one-unit increase in SE was associated with being 3.49 times more likely to have ever been tested for HIV (aOR=3.49, 95%CI:1.78-6.83). Although not statistically significant (*p*=0.06), a one-unit increase in DT was associated with being 1.43 times more likely to have ever been tested for HIV (aOR=1.43, 95%CI:.98-2.08).

Moderation Analyses

The two-way interaction between SE and DT was not significant (*b*=0.63, 95%CI:-.11-1.37, *p*=.094), indicating that DT did not moderate the association between SE and lifetime history of HIV testing. However, the three-way interaction term was significant (*b*=2.76, 95%CI:.52-5.00, *p*=.016), adding 7.51% to the explained variance above and beyond the HLR model. Results indicated that among participants who did not report any SRBs, the interaction between SE and DT, did not have an effect on lifetime history of HIV testing (*b*=-1.39, *p*=.165). However, if participants reported any SRBs, higher SE was associated with a higher likelihood of lifetime history of HIV testing (*b*=1.37, *p*=.012) at mean (mean=2.75; *b*=1.19, 95%CI:0.31-2.07, *p*=.008) and high levels of DT (1 *SD* above the mean=3.82; *b*=2.65, 95%CI:1.00-4.29, *p*=.002) but not at low levels of DT (1 *SD* below the mean=1.69; *b*=-.27, 95%CI:-1.46-.92, *p*=.654) (Figure 2). Therefore, DT only functioned as a moderator when participants engaging in SRBs reported mean and high levels of DT.

Discussion

Our first hypothesis of the positive association between SE and lifetime history of HIV testing was supported and is consistent with previous studies among other population groups that have shown that increasing SE may help to promote HIV testing (Pham, et al., 2019; Prati, et al., 2014; Zhao, et al., 2018). However, this finding should be interpreted with caution as we could not assess temporality. It is also likely that higher levels of SE increased as a consequence of having received HIV testing. According to (Bandura, 1977), learning from personal experiences of mastery arising from successful performances can increase a person's SE. Therefore, it is possible that participants may

have strengthened their SE for HIV testing as a result of having received HIV testing. Nonetheless, this finding shows a potential causal association between SE and HIV testing, and the potential value of incorporating SE in prevention strategies to facilitate HIV testing.

Our second hypothesis that DT would be positively associated with lifetime history of HIV testing was not supported among our study sample. Although DT was not a significant predictor of HIV testing, it approached statistical significance in the direction of higher levels of DT associated with being more likely to have ever been tested for HIV. Further research is needed to elucidate whether this association is stronger when measuring DT in the context of HIV testing and whether it exists among other Latino and emerging adult populations.

Our third hypothesis that DT would strengthen the association between SE and lifetime history of HIV testing was partially supported as this was only found among those that reported any SRBs. Specifically, we found that the association between SE and HIV testing was stronger for participants that reported any SRBs and have high and mean levels of DT. This finding suggests that DT and SE can work together to promote HIV testing among those engaging in SRBs. It appears that although having confidence in one's ability to getting tested for HIV and finding a testing place may motivate a person to get tested for HIV, higher DT levels may further facilitate HIV testing among those that engage in SRBs. Being able to tolerate and not avoid the psychological distress related to HIV testing may enhance one's confidence in their ability to take the preventive action of getting tested for HIV by regulating emotional responses to the uncertainty and negative expectations associated with HIV testing (Simons and Gaher,

2005). It is important to note that this finding should be interpreted with caution as the direction of this association is unknown. It is also possible that those participants that engaged in SRBs were more likely to utilize HIV prevention services, and as a result, they had higher levels of SE for HIV testing and DT. Further research should explore the direction of this three-way interaction.

If this finding is replicated, both SE and DT may be incorporated as targets in HIV testing interventions to effectively increase and promote HIV testing among individuals engaging in SRBs, and to further strengthen the effect of current HIV prevention interventions. For example, strategies to increase SE such as individualized risk-reduction counseling and motivational interviewing may incorporate strategies to develop DT (e.g., emotional acceptance skills) to encourage individuals engaging in SRBs to seek HIV testing even in the face of psychological distress related to HIV testing (Chapman, 2006; Herbst et al., 2007).

Furthermore, consistent with previous studies among emerging adults, females were more likely to have ever been tested for HIV than males (Caldeira, et al., 2012). This could be the result of females utilizing health services more than males and having more opportunities to be tested for HIV through routine gynecological and prenatal screenings (Anderson and Sansom, 2006; Caldeira, et al., 2012). This finding emphasizes the importance of continued outreach efforts to reach Latino males and increase the uptake of HIV testing in this population. This is particularly important as Latino males account for 22% of new HIV diagnoses in the U.S. (CDC, 2019a).

The prevalence of HIV testing among Latino emerging adults in this study was sub-optimal (59.9%). However, HIV testing prevalence for females (67.9%) and males

(51.3%) in this sample were higher than national estimates of HIV testing for female (46.5%) and male (26.8%) Latino emerging adults (Van Handel, et al., 2016); this may be due to the higher proportion of college students in our sample (66.2%) whom may be more likely to access sexual health services. Nonetheless, Latinos face barriers to accessing and receiving HIV testing including limited access to health care and HIV prevention services (Rao et al., 2016; Taveras et al., 2017).

Forty percent of participants reported never having been tested for HIV. Among these, the most frequently reported reasons for not testing included "weren't offered an HIV test" (47.6%) and "haven't done anything to get HIV" (47.6%) (data not shown). These two reasons have been consistently found to be significant barriers for HIV testing among young people in the U.S. (Cheong, Tucker, & Chandler, 2018; Peralta, Deeds, Hipszer, & Ghalib, 2007; Schnall, Rojas, & Travers, 2015). Therefore, these findings underscore the importance of changing HIV risk perceptions and improving self-efficacy to encourage Latino emerging adults to proactively seek and/or request HIV testing.

The present study has several limitations. The use of a non-probability sampling and only offering the online survey in English may limit the generalizability of these findings. The reliance on self-reported measures may have introduced recall and social desirability biases. The cross-sectional design of this study limited the analysis of temporal relationships. Also, this study didn't use standardized, validated scales to measure SE and DT in the context of HIV testing, as none exist specifically for HIV testing.

Despite these limitations, the findings of this study may have implications for the development of tailored HIV testing interventions for Latino emerging adults. Since HIV

testing is suboptimal in this population, prevention interventions should focus on increasing SE and DT to promote HIV testing among Latino emerging adults with the goal of reducing undiagnosed infections and HIV transmission. Future studies using prospective designs should examine these associations to determine temporality.

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Tables and Figures

Table 1. Characteristics of sexually active Latino emerging adults by lifetime history of HIV testing (n=157).

		Lifetime History of HIV Testing			
Characteristic	**Total**	**Yes**	**No**		
		n (%)	**n (%)**	**χ^{2a}**	**p-value**
Total	157	94 (59.9%)	63 (40.1%)		
Gender				4.49	**.034**
Male	76 (48.4)	39 (51.3)	37 (48.7)		
Female	81 (51.6)	55 (67.9)	26 (32.1)		
Partner Status				4.29	**.038**
Single	102 (65.0)	55 (53.9)	47 (46.1)		
Has partner	55 (35.0)	39 (70.9)	16 (29.1)		
Sexual Minority Status				3.22	**.073**
Heterosexual	132 (84.1)	75 (56.8)	57 (43.2)		
Sexual minority	25 (15.9)	19 (76.0)	6 (24.0)		
Nativity				2.32	.127
Immigrant	49 (31.2)	25 (51.0)	24 (49.0)		
U.S. born	108 (68.8)	69 (63.9)	39 (36.1)		
Current College Student				.89	.347
Yes	104 (66.2)	65 (62.5)	39 (37.5)		
No	53 (33.8)	29 (54.7)	24 (45.3)		
Education Level				9.82	**.002**
No bachelor's degree	116 (73.9)	61 (52.6)	55 (47.4)		
Completed bachelor's degree or higher	41 (26.1)	33 (80.5)	8 (19.5)		
Employment Status				.06	.804
Employed	131 (83.4)	79 (60.3)	52 (39.7)		
Unemployed	26 (16.6)	15 (57.7)	11 (42.3)		
Health Insurance				.16	.690
Yes	127 (80.9)	77 (60.6)	50 (39.4)		
No	30 (19.1)	17 (56.7)	13 (43.3)		
Study Site				4.23	**.040**
Miami-Dade County	74 (47.1)	38 (51.4)	36 (48.6)		
Maricopa County	83 (52.9)	56 (67.5)	27 (32.5)		
Sexual Risk Behaviors (Past 3 months)				1.90	.169
Yes	121 (77.1)	76 (62.8)	45 (37.2)		
No	36 (22.9)	18 (50.0)	18 (50.0)		
>1 sexual partners in the past 3 months	46 (29.3)[b]	24 (52.2)	22 (47.8)		
Yes	108 (68.8)	70 (64.8)	38 (35.2)		
No					

Sex under the influence of alcohol or drugs					
Yes	58 (36.9)	42 (72.4)	16 (27.6)		
No	99 (63.1)	52 (52.5)	47 (47.5)		
Unprotected sex					
Yes	77 (49.0)[b]	54 (70.1)	23 (29.9)		
No	76 (48.4)	38 (50.0)	38 (50.0)		
	M(SD)	**M(SD)**	**M(SD)**	**t-value[c]**	**p-value**
Age	21.5 (2.04)	21.9 (1.92)	21.0 (2.13)	-2.66	**.009**
Financial Strain	2.31 (.59)	2.37 (.59)	2.22 (.58)	-1.58	.116
Self-Efficacy for HIV testing	3.28 (.64)	3.47 (0.57)	3.01 (0.65)	-4.62[d]	**< .0005**
I feel confident that I could get tested for HIV.	3.25 (.75)	3.47 (.65)	2.93 (.79)		
I feel confident that I could locate a place where I can get tested for HIV.	3.32 (.73)	3.48 (.67)	3.09 (.77)		
Distress Tolerance	2.75 (1.06)	2.85 (1.04)	2.60 (1.09)	-1.47	.143

[a] All expected cell frequencies were greater than five for chi-square tests.
[b] Numbers may not sum up to n=157 due to missing data.
[c] The assumption of homogeneity of variances was met based on p-value >.05 on Levene's tests of equality of variance.
[d] Welch t-test was used due to the assumption of homogeneity of variances being violated, as assessed by Levene's test for equality of variances (p= .047).

Table 2. Hierarchical Logistic Regression Model Predicting Lifetime History of HIV Testing among sexually active Latino emerging adults (n=157).

	Model 1		Model 2		Model 3	
Variable	*aOR*	*95% CI*	*aOR*	*95% CI*	*aOR*	*95% CI*
Block 1						
Age	1.21	.99, 1.47	1.20	.99, 1.46	1.23	.99, 1.52
Gender (Ref: Male)						
Female	2.30	1.12, 4.69*	2.39	1.16, 4.93*	3.14	1.41, 7.02*
Education Level (Ref: No Bachelor Degree)						
Completed Bachelor Degree or Higher	2.27	.89, 5.78	2.27	.89, 5.77	1.83	.67, 4.98
Partner Status (Ref: Single)						
Has a Partner	1.33	.61, 2.91	1.28	.58, 2.82	1.26	.53, 3.02
Sexual Minority (Ref: Heterosexual)						
Sexual Minority	3.27	1.10, 9.76*	3.48	1.14, 10.65*	2.92	.82, 10.38
Study Site (Ref: Arizona)						
Florida	.64	.32, 1.31	.68	.33, 1.38	.77	.36, 1.66
Block 2						
Sexual Risk Behaviors (Ref: No)						
Yes	-	-	1.66	.71, 3.84	1.21	.48, 3.02
Block 3						
Self-Efficacy for HIV testing	-	-	-	-	3.49	1.78, 6.83*
Distress Tolerance	-	-	-	-	1.43	.98, 2.08

Note: * $p < .05$; Nagelkerke R^2=.203 for Block 1, Nagelkerke R^2 for Block 2=.213; Nagelkerke R^2 for Block 3=.342; Ref: Reference Group.

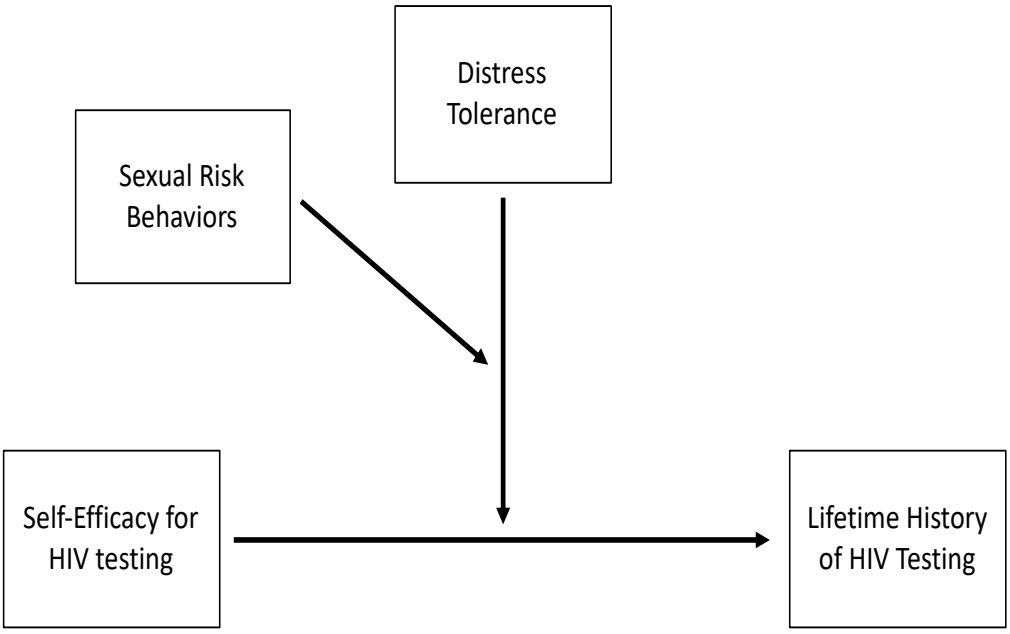

Figure 1. Three-way interaction modeling between self-efficacy for HIV testing, distress tolerance and sexual risk behaviors on lifetime history of HIV testing.

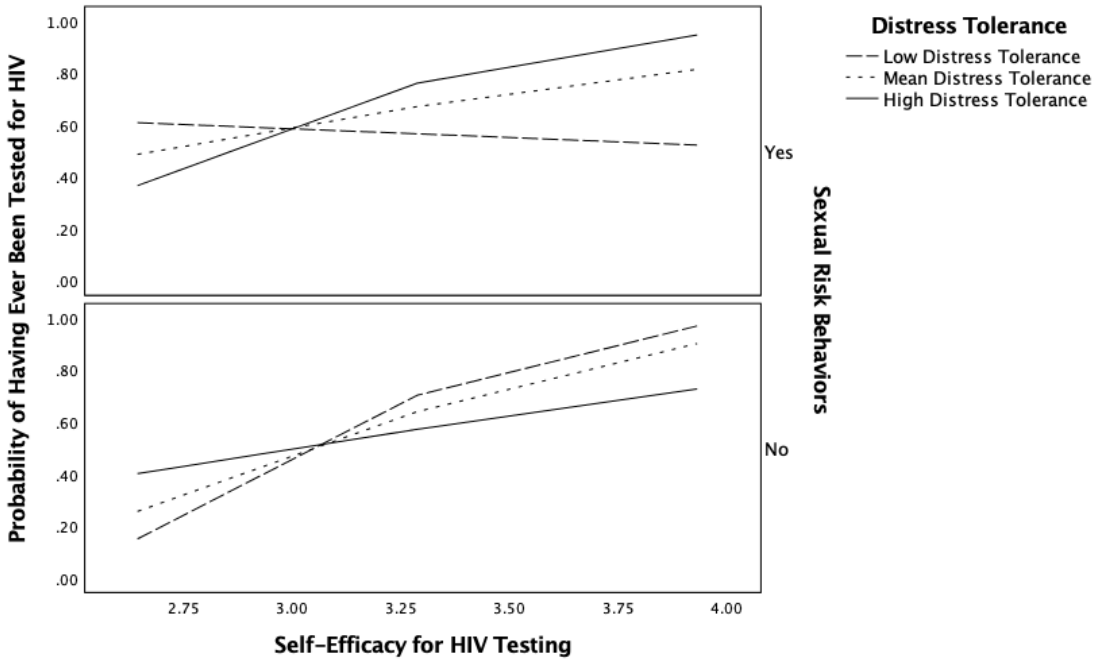

Figure 2. Three-way interaction with sexual risk behaviors and distress tolerance moderating the association between self-efficacy for HIV testing and lifetime history of HIV testing. Low distress tolerance=1 SD below the mean and high distress tolerance=1 SD above the mean.

MANUSCRIPT 3

Cognitive Reappraisal and HIV Testing Intentions among Latino Emerging Adults

Abstract

Introduction: Negative emotions related to HIV testing may influence an individual's intentions to test for HIV. However, emotion regulation strategies such as *cognitive reappraisal* which involves reframing the meaning of an event to modify one's emotional response to it, may potentially help to regulate these emotions and facilitate decisions to get tested for HIV. In the present study, we examined the association between cognitive reappraisal and HIV testing intentions and how this association may differ by gender.

Methods: Cross-sectional data were collected from a convenience sample of 157 sexually active Latino emerging adults aged 18-25 years living in Arizona and Florida through an online survey. Hierarchical logistic regression models were used to analyze the data.

Results: Results indicated that cognitive reappraisal was significantly associated with HIV testing intentions (aOR=1.44, 95%CI=1.04-1.99, p=.027) and that this association was specific to females (aOR=2.48, 95%CI=1.39-4.43, p=.002).

Discussion: Our results demonstrate the potential of cognitive reappraisal to facilitate HIV testing intentions among females. HIV prevention interventions should incorporate cognitive reappraisal training to regulate and adapt to the negative emotions associated with HIV testing in efforts to increase HIV testing.

Keywords: HIV testing, emotion regulation, cognitive reappraisal, Latino/a

Introduction

HIV testing is critical to reduce the number of undiagnosed HIV infections, receive HIV treatment and prevent transmission (Li, Purcell, Sansom, Hayes, & Hall, 2019). Yet, HIV testing rates are low among Latino emerging adults aged 18 to 24, a group with the second highest rate of HIV diagnoses among emerging adults in the United States (U.S.) (CDC, 2018a; Van Handel, Kann, O'Malley Olsen, & Dietz, 2016). Both female and male Latino emerging adults have lower rates of HIV testing compared to non-Latino Black emerging adults (Latino males: 26.8%, Latina females: 46.5%; non-Latino Black males: 45.3%, non-Latino Black females: 59.9%) (Van Handel et al., 2016), which increases their risk for undiagnosed infections. In addition, the proportion of HIV infections that are undiagnosed and diagnosed late is higher for Latinos compared to non-Latino Blacks and Whites (CDC, 2009, 2018b).

Despite the CDC recommendation for routine HIV testing, a significant proportion of Latinos and young people report "never offered an HIV test" as their main reason for having never been tested for HIV (Febo-Vazquez, Copen, & Daugherty, 2018). Therefore, encouraging people to voluntarily seek HIV testing is important to increase HIV testing rates and reduce late diagnosis. Social-cognitive theories, such as Theory of Planned Behavior propose that a key determinant of performing a health behavior is the individual's intentions to perform the behavior (Ajzen, 1991). Thus, HIV testing intentions may be particularly important in the decision-making process of whether and when to get tested for HIV.

Emotional responses to HIV testing might influence an individual's intentions to test for HIV. Negative emotions related to HIV testing, such as fear, shame, and anxiety,

which are rooted in HIV stigma deter seeking HIV testing (Joseph et al., 2011; Lin, Roy, Dam, & Coman, 2017). Therefore, the ability to regulate these emotions may be an important protective factor for HIV testing behavior. One potential emotion regulation strategy is cognitive reappraisal. Cognitive reappraisal involves reframing or reinterpreting the meaning of an event in order to modify one's emotional response to it (Gross, 1998). In the context of HIV testing, cognitive reappraisal may help to mitigate negative emotions related to HIV testing, find the benefits of testing, and facilitate the decision to get tested. However, these potential benefits of cognitive reappraisal on HIV testing decision making may be more likely for females, as they have a greater tendency to engage in reappraisal as compared to males (Nolen-Hoeksema, 2012).

No previous studies have examined cognitive reappraisal in the context of HIV testing. Therefore, the aim of the present study was to examine the association between cognitive reappraisal and HIV testing intentions among Latino emerging adults and how this association differs by gender. We hypothesized that 1) higher levels of cognitive reappraisal will be positively associated with HIV testing intentions, and 2) the effect of cognitive reappraisal on HIV testing intentions will be moderated by gender in such a way that the association would be stronger for females than males.

Methods

A cross-sectional online survey study (*Project on Health among Emerging Adult Latinos*-Project HEAL) was conducted to collect data from a convenience sample of 200 Latino emerging adults from August 2018 to February 2019. Only 157 participants that reported being sexually active were included in this study. Participants were recruited through online platforms, listservs, flyers, and word-of-mouth. The eligibility criteria

were being Latino/Hispanic, between 18 to 25 years of age, currently living in Maricopa County, Arizona or Miami Dade County, Florida, and able to read English. Participants received a $30 Amazon e-gift card for completing the 50-minute online survey. The study was approved by the Institutional Review Board of Florida International University.

Measures

HIV Testing Intentions was assessed with the question "*How likely is that you will get tested for HIV in the next 12 months?*". Responses included 1=*very unlikely*, 2=*somewhat unlikely*, 3=*somewhat likely*, 4=*very likely*. Those participants that responded *very likely* and *somewhat likely* were coded as "*1=having intentions to get tested for HIV*" (as these acknowledged a potential likelihood of getting tested for HIV in the future), and those that responded *very unlikely* and *somewhat unlikely* were coded as "*0=not having intentions to get tested for HIV*".

Cognitive Reappraisal was measured using the six-items subscale from the Emotion Regulation Questionnaire (Gross & John, 2003) (e.g., I control my emotions by changing the way I think about the situation I'm in), with responses ranging from 1=*strongly disagree* to 7=*strongly agree*. Item responses were averaged and higher scores indicated a higher level of using cognitive reappraisal for emotion regulation (α=.92).

Covariates

Perception of HIV risk, sexual risk behaviors, lifetime history of HIV testing and HIV stigma were included as covariates to reduce potential confounding effects, as these variables are associated with HIV testing intentions (Evangeli et al., 2018; Glasman, Weinhardt, Difranceisco, & Hackl, 2010; Meadowbrooke, Veinot, Loveluck, Hickok, & Bauermeister, 2014). *Perception of HIV risk was* coded as 0=none and

1=small/moderate/high, *sexual risk behaviors* as having >1 sexual partners, sex under the influence of alcohol or drugs, or unprotected sex in the past 3 months, and *lifetime history of HIV testing* as 1=Yes and 0=No. *HIV Stigma* was measured using the 3-item stigma sub-scale concerns with public attitudes (Reinius et al., 2017) (α = .85). *Sociodemographic variables* were also included and are listed in Table 1.

Statistical Analysis

Descriptive statistics, *t*-tests, and chi-square (X^2) tests, were used to compare HIV testing intention groups across all independent variables. Hierarchical logistic regression (HLR) was used to examined predictors of HIV testing intentions. Only sociodemographic variables with a *p*-value < 0.10 in the bivariate analyses were included in the final model. Block 1 included the sociodemographic variables, block 2 perception of HIV risk, sexual risk behaviors, lifetime history of HIV testing and HIV stigma, and block 3 the cognitive reappraisal. In block 4 an interaction term was added (gender *x* cognitive reappraisal), and stratified models were fitted by gender. Statistical significance of <0.05 was used and adjusted odds ratios (aOR) and 95% confidence intervals (CIs) were reported. All analyses were conducted using SPSS V.25.

Results

A total of 86 (54.8%) participants had intention to test for HIV in the next 12 months. Table 1 compares all variables by HIV testing intention groups.

Predictors of HIV Testing Intentions

Results from the HLR models indicated that 35.2% of the variance of HIV testing intentions was explained by all independent variables included in the model (Table 2), with block 1 explaining 18.3% (Nagelkerke R^2=.183, $\chi^2(5)$=22.61, *p*=.000), block 2

13.6% (Nagelkerke R^2=.319, $\chi^2(9)$=41.89, *p*=.000), and block 3 3.3% (Nagelkerke R^2=.352, $\chi^2(10)$=46.99, *p*=.000).

Table 2 shows that HIV testing intentions was significantly associated with sexual minority status (aOR=5.64, 95%CI=1.65-19.23, *p*=.006), study site (aOR=.29, 95%CI=.12-.70, *p* =.005), perception of HIV risk (aOR=2.90, 95%CI=1.27-6.66, *p*=.012) and lifetime history of HIV testing (aOR=4.61, 95%CI=2.07-10.27, *p*=<.0005). Cognitive reappraisal was also significantly associated with HIV testing intentions (aOR=1.44, 95%CI=1.04-1.99, *p*=.027). Specifically, a one-unit increase in cognitive reappraisal was associated with being 1.44 more likely to having intentions to test in the next 12 months.

Moderation Analyses

In block 4, the interaction term between cognitive reappraisal and gender was statistically significant (*p*=.042). Results from the stratified model for females showed that a one-unit increase in cognitive reappraisal score was associated with being 2.48 more likely to having intentions to test in the next 12 months (aOR=2.48, 95%CI=1.39-4.43, *p*=.002). For males, cognitive reappraisal was not significantly associated with HIV testing intentions (aOR=.95, 95%CI=.60-1.50, *p*=.831).

Discussion

Our results indicated that cognitive reappraisal was positively associated with HIV testing intentions. Making a testing decision involves dealing with the potential of an HIV-positive status and the fear of facing negative consequences (Joseph et al., 2011; Lin et al., 2017). However, it appears that having the ability to reframe the meaning and associated emotions of HIV testing facilitates the decision to test for HIV. Previous studies have shown that cognitive reappraisal is effective in decreasing the experience of

fear and anxiety (Hofmann, Heering, Sawyer, & Asnaani, 2009; Shore, Cohen Kadosh, Lommen, Cooper, & Lau, 2017). This is because individuals who engage in cognitive reappraisal tend to look for the positive attributions and interpretations of an event, reducing their experience of negative emotions (Nolen-Hoeksema, 2012). Therefore, learning to use cognitive reappraisal may serve as an important protective factor to promote HIV testing. Also, cognitive reappraisal may help in managing an HIV diagnosis. Previous studies have found that positive reappraisal is associated with better psychological and physical health outcomes among individuals living with HIV (Finkelstein-Fox, Park, & Kalichman, 2019; Moskowitz, Hult, Bussolari, & Acree, 2009).

As expected, the positive effect of cognitive reappraisal on HIV testing intentions was specific to females. This finding is in line with previous research that shows that females are more likely to engage in reappraisal as compared to males, which may be the result of gender differences in the appraisal of stressors (Tamres, Janicki, & Helgeson, 2002). Females experience more distressing and intense emotions and appraise negative events as more stressful than males (Nolen-Hoeksema, 2012). In the case of HIV testing, females may experience this event as being more stressful because they are more susceptible to and internalize more the negative cultural views and gender expectations surrounding HIV (Sandelowski, Lambe, & Barroso, 2004). Therefore, using cognitive reappraisal to regulate negative emotions related to HIV testing may be more necessary for females than males.

This study has some limitations including the non-probability sampling, reliance on self-reported measures and the use of a measure of cognitive reappraisal not specific to HIV testing. In spite of these limitations, these findings suggest that cognitive

reappraisal is a promising emotion regulation strategy that may help people find the benefits of HIV testing (e.g., receiving HIV treatment and care) and facilitate their decision to get tested for HIV. HIV prevention programs should incorporate cognitive reappraisal training (e.g., reinterpretation (Denny & Ochsner, 2014)) to regulate and adapt to negative emotions and facilitate HIV testing intentions (and potentially actual HIV testing) among Latino emerging adults. More research is needed on the specific positive and negative emotions related to HIV testing in this population and to determine which emotion regulation strategies might have the most influence on the decision to test for HIV.

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Tables

Table 1. Characteristics of participants by HIV testing intentions (n=157).

	HIV Testing Intentions			
Characteristic	**Yes**	**No**		
	n (%)	**n (%)**	**χ^{2} [a]**	***P* value**
Total	86 (54.8)	71 (45.2)		
Gender			.27	.601
Male	40 (52.6)	36 (47.4)		
Female	46 (56.8)	35 (43.2)		
Partner Status			.01	.913
Single	55 (54.5)	46 (45.5)		
Has Partner	31 (55.4)	25 (44.6)		
Sexual Minority Status			7.64	.006
Heterosexual	66 (50.0)	66 (50.0)		
Sexual Minority	20 (80.0)	5 (20.0)		
Nativity Status			2.81	.094
Immigrant	22 (44.9)	27 (55.1)		
U.S. born	64 (59.3)	44 (40.7)		
Current College Student			1.06	.304
Yes	60 (57.7)	44 (42.3)		
No	26 (49.1)	27 (50.9)		
Education Level			5.70	.017
No Bachelor's Degree	57 (49.1)	59 (50.9)		
Completed Bachelor's Degree or Higher	29 (70.7)	12 (29.3)		
Employment Status			.09	.761
Employed	73 (55.3)	59 (44.7)		
Unemployed	13 (52.0)	12 (48.0)		
Health Insurance			2.57	.108
Yes	74 (57.8)	54 (42.2)		
No	12 (41.4)	17 (58.6)		
Study Site			8.35	.004
Miami-Dade County	31 (42.5)	42 (57.5)		
Maricopa County	55 (65.5)	29 (34.5)		
Sexual Risk Behaviors			.20	.652
Yes	68 (55.7)	54 (44.3)		
No	18 (51.4)	17 (48.6)		
Perception of HIV Risk			1.67	.196
None	29 (48.3)	31 (51.7)		
Small/Moderate/High	56 (58.9)	39 (41.1)		
Lifetime History of HIV Testing			21.76	.000
Yes	66 (70.2)	28 (29.8)		

No	20 (32.3)	42 (67.7)		
	M(SD)	**M(SD)**	**t-value [b]**	**p-value**
Age	21.6 (2.03)	21.4 (2.07)	.527	.599
HIV Stigma	9.07 (2.07)	9.11 (1.68)	-.129	.897
Cognitive Reappraisal	5.18 (1.26)	4.93 (1.23)	1.27	.208

[a] All expected cell frequencies were greater than five for chi-square tests.
[b] The assumption of homogeneity of variances was met based on p-value >.05 on Levene's tests of equality of variance.

Table 2. Hierarchical Logistic Regression Model Predicting Intentions to Test for HIV in the Next 12 Months among Sexually Active Latino Emerging Adults (n=154)

	Model 1				Model 2				Model 3			
Variable	*B*	*SE*	*aOR*	*95% CI*	*B*	*SE*	*aOR*	*95% CI*	*B*	*SE*	*aOR*	*95% CI*
Block 1												
Gender (Ref: Male)												
Female	.17	.36	1.18	.59, 2.38	.10	.40	1.11	.51, 2.40	.25	.41	1.28	.58, 2.85
Sexual Minority (Ref: Heterosexual)												
Sexual Minority	1.53*	.56	4.59	1.54, 13.68	1.58*	.61	4.87	1.47, 16.15	1.73*	.63	5.64	1.65, 19.23
Nativity Status (Ref: Immigrant)												
U.S. Born	.15	.41	1.16	.52, 2.61	.03	.44	1.03	.43, 2.45	-.06	.46	.94	.38, 2.31
Education Level (Ref: No Bachelor Degree)												
Completed Bachelor Degree or Higher	.72	.42	2.06	.91, 4.66	.49	.46	1.63	.66, 4.02	.48	.46	1.62	.65, 4.03
Study Site (Ref: Arizona)												
Florida	-.97*	.38	.38	.18, .81	-1.10*	.42	.33	.15, .77	-1.23*	.44	.29	.12, .70
Block 2												
Perception of HIV Risk (Ref: None)												
Small/Moderate/High	-	-	-	-	.88*	.41	2.41	1.09, 5.33	1.07*	.42	2.90	1.27, 6.66
Lifetime History of HIV Testing (Ref: No)												
Yes	-	-	-	-	1.46*	.40	4.32	1.99, 9.39	1.53*	.41	4.61	2.07, 10.27
Sexual Risk Behaviors (Ref: No)												
Yes	-	-	-	-	-.05	.45	.96	.40, 2.32	-.16	.47	.85	.34, 2.12
HIV Stigma	-	-	-	-	-.05	.10	.96	.78, 1.17	-.06	.10	.94	.77, 1.15

Block 3												
Cognitive Reappraisal	-	-	-	-	-	-	-	-	.36*	.17	1.44	1.04, 1.99

Note: * $p < .05$; Nagelkerke R^2=.183 for Block 1, Nagelkerke R^2 for Block 2=.319; Nagelkerke R^2 for Block 3=.352; Ref: Reference Group.

Conclusions

The high risk for undiagnosed HIV cases and low uptake of HIV testing among Latino emerging adults reinforce the importance of researching the factors influencing their HIV testing behaviors to develop interventions that are effective in increasing HIV testing. To our knowledge, this is the first study that encompassed a sample of Latino emerging adults aged 18 to 25 to identify sociocultural and psychological factors influencing HIV testing behaviors in this population.

Our findings indicated that familism support was negatively associated with lifetime history of HIV testing and that this association was specific to immigrants. These findings suggest that family support plays a key role in the HIV testing behaviors of immigrant Latino emerging adults. Therefore, sociocultural differences and nativity status should be considered when developing HIV testing programs for young Latinos to increase their effectiveness.

We further found evidence that the psychological factor of self-efficacy for HIV testing was positively associated with lifetime history of HIV testing among Latino emerging adults and that this association was specific to those with higher levels of distress tolerance and engaging in sexual risk behaviors. These findings suggest that a focus on increasing beliefs in one's ability to get tested for HIV and tolerance for psychological distress may lead to more effective prevention efforts to increase HIV testing among high-risk groups. Finally, this study also found that cognitive reappraisal was positively associated with HIV testing intentions and that this association was specific to females. This finding shows the potential for cognitive reappraisal to facilitate HIV testing by regulating negative emotions (e.g., fear, anxiety) and reframing the

meaning of HIV testing. Further assessing these associations in studies with prospective designs is important to allow for more confident casual inferences to be made.

Nonetheless, our findings collectively highlight the significance of sociocultural and psychological factors that are associated with HIV testing behaviors and may have the potential to inform evidence-based prevention programs that promote HIV testing among Latino emerging adults. Our findings suggest that promoting family support for HIV testing, increasing self-efficacy and distress tolerance for HIV testing, and enhancing regulation and reappraisal of negative emotions related to HIV testing may be beneficial. Gender and nativity status differences should be considered to further enhance the effectiveness of HIV testing programs.

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PUBLICATIONS (Selected)

Ramírez-Ortiz, D., Sheehan, D.M., Ibanez, G.E., Ibrahimou, B., De La Rosa, M., & Cano, M.A. (in press). Self-efficacy and HIV testing among Latino Emerging Adults: Examining the Moderating Effects of Distress Tolerance and Sexual Risk Behaviors. *AIDS Care.*

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