Patterns of Substance Use Onset among Hispanics in Puerto Rico and the United States

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Abstract

Purpose—Examine patterns of progression in substance use among Hispanic youth 13 to 17 years of age from two longitudinally representative studies.

Method—Patterns of substance use among youth in Puerto Rico were examined using a longitudinal study (n= 663) of adolescents living on the island. The National Longitudinal Study of Youth was used to examine patterns of substance use among Hispanics living in the United States (n= 1445). Latent transition analysis was used to estimate the probability of membership in each stage of substance use and incidence of transitions between different substance use stages over time.

Results—Six stages best described the heterogeneity in substance use among youth in Puerto Rico. Five stages were sufficient to describe patterns of substance use among youth in the United States. Youth living in Puerto Rico reported lower rates of smoking and illicit drug use, but higher rates of alcohol use, when compared with rates among Hispanics in the United States.

Discussion—Similar patterns of substance use were identified for Hispanic youth living in the United States and youth living in Puerto Rico.

Keywords

Substance use; Hispanic; adolescents; Puerto Rico; United States; latent transition analysis

1.0 Introduction

The Hispanic population is the fastest growing ethnic population in the United States (United States Census Bureau, 2004) and more likely than the non-Hispanic population to initiate drug use at a younger age (Johnston, O'Malley, Bachman, & Schulenberg, 2006). In the United States, an almost invariant pattern of substance use progression has been observed among adolescents (Kandel, 2002). Adolescents initiate substance use involvement with either alcohol or tobacco, and for youth who continue to advance in substance use, the progression then leads to heavy drinking and marijuana use, followed by other hard drugs. When compared with patterns of substance use progression across ethnic groups, Hispanic youth living in the United States were more likely to initiate the substance use involvement with alcohol than with cigarettes (Warheit, Vega, Khoury, Gil, & Elfenbein, 1996). Fewer studies, however, have examined how patterns of substance use onset compare between Hispanics living in the United States and foreign-born Hispanics (Vega & Gil, 2005). An extant amount of research has shown that U.S.-born Hispanics have higher rates of illicit substance use when compared to African American and non-Hispanic white adolescents (Delva et al., 2005; Johnston et al., 2006) as well as when compared to foreign-born Hispanic youth or youth living in their country of origin (Canino, Anthony, Freeman, Shrout, & Rubio-Stipec, 1993; Vega & Gil, 2005; Warner, Canino, & Colón, 2001). To examine whether the onset process that characterizes the general population in the United States differs from the patterns of use among Hispanic populations, the current study uses longitudinal data to estimate the prevalence and progression of substance use among Hispanic youth living in the United States and Hispanics living in their country of origin (in this case living in Puerto Rico). We hypothesize that differences in prevalence rates between foreign-born Hispanics and Hispanics living in the United States might be associated with cultural heterogeneity in the patterns of substance use progression. Specifically, we address the following research questions: (1) what are the stages that best describe the patterns of substance use progression among Hispanics living in Puerto Rico and those in the United States, and (2) are there differences in the patterns, prevalence or transition rates between these two populations?

2.0 Method

2.1 Participants

Two waves of data from the National Longitudinal Study of Youth (NLSY97), a nationally representative sample of youth living in the United States, were used (United States Department of Labor, 2005). Youth who self-identified as Hispanic, who were interviewed at the second (1998 cohort) and/or third wave (1999 cohort) of data collection, and who were between the ages of 13 to 17 (in 1998) were included. A total of 1445 students met the inclusion criteria (50.04% females; mean age = 15.48, sd = 1.14). Adolescents living in Puerto Rico were selected from the Service Use, Need and Outcome Study (Canino et al., 2004; Dierker, Ramirez, Chavez, & Canino, 2005), a longitudinal island-wide probability household sample of children ranging in age from 4 to 17 at the first wave (1999–2000; and interviewed one year later). For the present study, adolescents between ages 13 to 17 (in 1999) were included (n= 663; 46.4% females; mean age = 15.02, sd = 1.39).

2.2 Measures and A nalytical Strategy

Four items at each time were used to measure participants' involvement with substance use: (1) ever used alcohol, (2) ever used cigarettes, (3) drunkenness, and (4) ever used illicit drugs (including marijuana, cocaine, and heroine). Table 1 reports the weighted percentage (self-report) of youth who reported having used each substance at each time of

measurement. To investigate the patterns of substance use over time among Hispanics, several models were evaluated using latent transition analysis (LTA) (Lanza, Collins, Schafer, & Flaherty, 2005). The Mplus software was used to fit all models (Muthén & Muthén, 1998–2006), and sampling weights were incorporated to account for the complex sampling design of each study.

3.0 Results

To investigate the patterns of substance use over time among Hispanics living in Puerto Rico and those living in the United States, we examined the relative fit of several models (e.g. 4-, 5-, 6-, and 7-stages), separately for each sample. For youth living in Puerto Rico, a model with six stages best described the heterogeneity in substance use (X^2= 85.713, df= 183, BIC= 3879.85). Among Hispanic youth living in the United States, a model with only five stages provided optimal fit (X^2 = 267.164, df= 203, BIC= 10078.58) and interpretation.

To interpret the stages of substance use for each sample, we examined the item-response probab**li** ties for each item conditional on membership in each stage of substance use. Table 2 (first four columns) shows these probabilities for youth living in Puerto Rico and for Hispanics in the United States. Note that these probabilities were constrained to be equal at the two times, allowing for an identical interpretation of the stages over time. The following six stages emerged among Puerto Rican youth: (1) no use, (2) alcohol only, (3) alcohol and cigarettes, (4) heavy drinking (nonsmoking), (5) heavy drinking (smoking) and (6) advanced drug use. Substance use stages among Hispanics in the United States were: (1) no use, (2) alcohol only, (3) alcohol and cigarettes, (4) heavy drinking, and (5) advanced drug use. This difference, however, is potentially associated with measurement differences between the two samples of Hispanics. As Table 2 (last two columns) report, at time 1, substance use involvement was higher among Hispanic youth in the United States than among youth in Puerto Rico. For instance, 55 percent of youth in Puerto Rico are in the No Use stage at time 1 compared with 46 percent of Hispanic in the United States. One year later, the proportion of youth in the No Use stage, however, was slightly lower among youth in Puerto Rico (38%) when compared with Hispanics in the United States (41%). Table 3 reports the probability of membership in a substance use stage at a later time (time 2) conditional on the probability of membership in another stage at an earlier time (time 1).

4.0 Discussion

The current study examined patterns of substance use onset among Hispanic youth living in the United States and in Puerto Rico. Although differences in the lifetime prevalence and transition rates were observed, similar stages of substance use were evident between these two samples. For instance, a stage describing "cigarette use only" was not evident among Hispanics (both living in Puerto Rico and the United States), suggesting that Hispanics initiate substance use with alcohol and not necessarily with cigarettes. Nevertheless, findings from the current study did not support the hypothesized relation that lower prevalence of substance use among foreign-born Hispanics when compared with Hispanics living in the United States might be associated with cultural dependent patterns of substance use progression. It is important to acknowledge, however, that the correlates of substance use progression might well differ across contextual backgrounds (Bird et al., 2006).

One limitation of the current study is that there were differences between the two samples in how drunkenness was assessed, limiting our ability to draw a direct comparison for the rates of drunkenness between the two samples. Future research should examine patterns of progression to recent and regular substance use; assess patterns of substance use over longer period of time, as Hispanic youth transition to adulthood; and examine how models of

substance use compare across different subgroups of Hispanic adolescents (e.g. Puerto Ricans, Mexican Americans, Cubans, etc.).

In conclusion, alcohol use (and not cigarettes) initiated the progression of drug use among Hispanic adolescents (from both contexts), highlighting the need to target alcohol use in prevention and policy efforts. Examining patterns of substance use for both Hispanic in the United States and foreign-born Hispanics, particularly as the U.S. Hispanic population continues to grow (both because there are more U.S.-born Hispanics and because of immigration), is important in order to further guide the development of the next generation of drug abuse preventive interventions for Hispanics youth.

Acknowledgments

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Table 1

Prevalence of alcohol use and other drug use behaviors among Hispanic youth 13–17 at time 1 and time 2

	Puerto Rico (n= 663)		United States (n= 1445)	
	Time 1	Time 2	Time 1	Time 2
Lifetime Alcohol Use	48.7	56.4	47.4	50.3
Lifetime Cigarette Use	16.4	17.1	31.0	31.6
Drunkenness [1]	15.2	19.5	10.6	14.7
Lifetime Illicit drug use	7.2	8.3	22.9	22.7

[1]In Puerto Rico, drunkenness refers to any episodes in life. In the United States, drunkenness refers to any episodes in past 30 days.

Table 2

Item response probability and probability of membership in each stage of substance use among Hispanic youth (ages 13–17)

Class	Item response probabilities [1]				Label	Probability of membership [2]	
	Alcohol	Cigarettes	Drunk	Illicit		Time 1	Time 2
			Puerto Rico				
1	0.00	0.013	0.00	0.00	No use	.554	.375
2	1.00	0.00	0.00	0.010	Alcohol only	.261	.336
3	0.604	1.00	0.00	0.329	Alcohol and Cigarettes	.008	.019
4	1.00	0.117	1.00	0.056	Heavy drinking (non-smoking)	.053	.104
5	1.00	1.00	.551	0.00	Heavy drinking (smoking)	.024	.042
6	1.00	1.00	0.779	0.651	Advanced drug use	.100	.125
			United States				
1	0.094	0.037	0.00	0.011	No use	.457	.412
2	0.724	0.169	0.00	0.162	Alcohol only	.233	.230
3	0.585	0.756	0.00	0.321	Alcohol and cigarettes	.126	.142
4	1.00	0.442	1.00	0.445	Heavy drinking	.051	.066
5	1.00	0.914	0.568	0.818	Advanced drug use	.133	.152

[1] Probability of responding "yes" to each substance use item (i.e. alcohol, cigarettes, drunk, illicit) conditional on substance use stage membership

[2] Probability of membership in a substance use stage at time 1 and time 2 (estimate of the prevalence in each stage of substance use)

Table 3

Transition probabilities at time 2 conditional on stage membership at time 1 among Hispanic youth (ages 13 to 17) [1]

	No Use	Alcohol only	Alcohol and Cigarettes	Heavy drinking (non-smoking)	Heavy drinking (smoking)	Advanced drug use
Puerto Rico						
No Use	.677	.211	.000	.083	.028	.000
Alcohol only	--	.838	.042	.102	.002	.015
Alcohol and Cigarettes	--	--	1.0	.000	.000	.000
Heavy drinking (nonsmoking) [2]	--	--	--	.592	.024	.384
Heavy drinking (smoking) [2]	--	--	--	--	1.0	.000
Advanced drug use	--	--	--	--	--	1.0

	No Use	Alcohol only	Alcohol and Cigarettes	Heavy drinking	Advanced drug use
United States					
No Use	.898	.023	.053	.019	.008
Alcohol only	--	.811	.000	.189	.000
Alcohol and Cigarettes	--	--	.842	.036	.121
Heavy drinking [4]	--	.603	.219	.178	.000
Advanced drug use	--	--	--	--	1.00

[1] Probability of membership in a certain stage of substance use at time 2 conditional on membership on another substance use stage at time 1 (e.g. among youth in Puerto Rico, the probability of membership in the Alcohol only stage at time 2 conditional on membership in the No use stage at time 1 was .211)

[2] Drunkenness refers to any episodes in life.

[3] Illogical transitions between substance use stages (e.g. having tried alcohol and cigarettes at time 1 and transitioning to never having tried any substances at time 2) were fixed to zero (identified by "--").

[4] Drunkenness item represents + 5 drinks in last 30 days.