Substance Use among Asian American Subgroups: A Longitudinal Analysis of the National Longitudinal Study of Adolescent to Adult Health

Zobayer Ahmmad, Daniel E. Adkins, Bethany G Everett

I. Introduction

Considered as a monolithic group, Asians in the U.S. report a lower prevalence of substance use, or lower level of tobacco consumption, drinking, and illicit drug use, compared to Whites, African Americans, and Hispanic Americans in the U.S. (see (Dunbar et al. 2018), (Price et al. 2002), (Wong, Klingle and Price 2004)). Centers for Disease Control and Prevention (CDC) reports that nationwide 9% Asians smoke cigarettes, which is the lowest among all measured racial/ethnic groups in 2016 (CDC 2016). Such findings, which conceptualize Asians as a single group, however, mask substantial heterogeneity in substance use across Asian American subgroups.

Recently, due to the availability of disaggregated data across Asian subgroups in the US census, and other nationally representative data sources, there has been some progress towards distinguishing between Asian subgroups in health behavior research. For instance, a recent study using data from the Youth Risk Behavior Surveillance System examined health risk behaviors such as alcohol and cannabis use among Asian and Pacific Islander students. Results reveal that the Asians and Pacific Islander high school students differ significantly in terms of health risk behaviors in the US, with more Asian American students than Pacific Islander students using marijuana, alcohol, and smoking cigarettes (Lowry et al. 2011). Additionally, using data from the National Longitudinal Study of Adolescent Health Ryabov (2015) found that rates of using substance, especially the use of illicit drugs, vary widely across major Asian subgroups (e.g., youths from Filipino families tend to take more illicit drugs than East Asian peers (Ryabov 2015)).

Although recent studies began to examine substance use among Asian American subgroups (Bersamira et al. 2017, Price et al. 2002) these studies have several limitations including: 1) using cross sectional design and/or 2) obscuring differences across substances, and limiting statistical power by collapsing data into a single dichotomous substance use variable. Using the National Longitudinal Study of Adolescent to Adult Health (Add Health), this study investigates substance use, including tobacco, marijuana, alcohol, cocaine, methamphetamine, and other drugs from adolescence (aged 12-18) to adulthood (aged 32-42) among Chinese, Filipino, Japanese, Asian Indian, Korean, Vietnamese, other Asian, and individuals identifying as multiple Asian ethnicities.

II. Methods

Dependent variables come from Wave I to Wave V of the Add Health data set. Add Health is the nationally representative sample of adolescents to young adults in the United States. The questions on whether someone used methamphetamine were not asked in Wave I and Wave II. Other drugs category in this study includes inhalants, opioids, heroin, other prescription drugs. We assess racial/ethnic identifications from Add Health Wave I. Add Health questionnaire allows respondents to identify their racial/ethnic identifications in detail categories. Thus, there are Asian subcategories such as Chinese, Vietnamese, and Japanese, which allowed respondents to identify their family's nation of origin, in addition to identifying as Asian. We use generalized random intercept models to account for observations being non-independent within subjects across the Waves of data collection (Pinheiro and Bates 2000) . For the dichotomous indicators of individual substances we used a logistic link function, and for latent substance use we used the default linear link function for continuous outcomes (Gelman and Hill 2006) To address missingness in the data, we use 5 multiple imputations (MI) using *multiple imputation with chained equations (MICE)* technique. Results presented in

Table 1 only include Asian ethnicities, but analyses including all US racial/ethnic groups have been conducted and will be discussed in the presentation.

III. Results

In Figure 1, we show substance use age trajectory across Asian subgroups, with the addition of a White reference group, using median splines (Wegman and Wright 1983). The trajectories of drug use, including smoking, marijuana, drinking show a heterogenous pattern for Asian American subgroups. Interestingly, most Asian groups tend to use substance at a greater rate at the ages between 23-31 years than any other ages. Perhaps, strict family supervision during adolescent contributes to the relatively modest use of substance during adolescence.

Model 1 (in Table 1) examines overall substance use across Asian subgroups controlling for nativity status, sex, age, and parental income and education. The findings show that the likelihood of overall substance use is disproportionate across Asian American subgroups, with the highest likelihood of substance use among Koreans (β=0.31; p<0.05). In Table 1, Model 2 to Model 7, we examined separate substance categories (tobacco, marijuana, alcohol, cocaine, methamphetamine, and other drugs). In general, the likelihood of substance use appears to be the highest among Koreans and the lowest among Vietnamese and Chinese. Koreans were significantly more likely to smoke tobacco (β=3.08; p <0.05), use marijuana (β=1.04; p <0.05), use cocaine (β=1.02; p <0.05), other drugs (β=0.89; p <0.05) than the Chinese reference group, whereas Vietnamese are significantly more likely to use only other drugs (β=0.94; p <0.05) than Chinese. No other Asian groups, except Japanese, were significantly more likely to use methamphetamine (β=1.40; p <0.05) than Chinese. Japanese were also more likely to smoke tobacco (β=2.22; p <0.05) and use marijuana (β=0.93; p <0.05) than Chinese. Respondents, who identified as more than one Asian ethnicity, were observed to smoke tobacco (β=2.11; p <0.05*)* and consume marijuana (β=1.26; p <0.05) significantly more than Chinese. Asian Indians were more likely to use marijuana (β=1.18; p <0.05) and other drugs (β=1.34; p <0.05) than the Chinese reference group.

IV. Discussion:

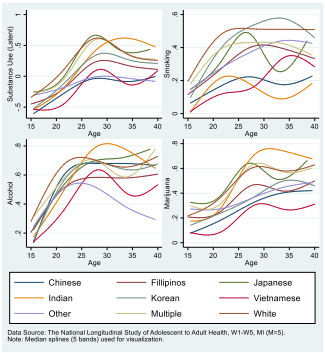
First, the longitudinal analysis supports previous findings that heterogeneity exists among Asian American subgroups in terms of substance use (Bersamira et al. 2017, Wong et al. 2004), and also demonstrate that different ethnicities within the Asian category have the propensity to use different type/s of substance. For instance, while most Asian subgroups tend to be less likely to use illicit “hard “drugs, such as cocaine and methamphetamine, Japanese are more likely to consume methamphetamine and Koreans are more likely to use cocaine. Second, there looks to be a universal effect of immigration status on drug use pattern. That is, being a first-generation immigrant significantly attenuates the ethnic disparities in substance use (result omitted from the table for brevity). Third, interestingly, individuals identifying as multiple Asian ethnicities appears to be one of the highest risk groups in terms of substance use. This finding is consistent with a previous study that examined the relationship between multiracial identification and adolescent problem behavior, including substance use (Choi et al. 2006). In our complete study, we aim to investigate Asians identifying mixed race with white, African American, and Hispanic American in relation to substance use, given the high rates of assimilation among Asians, particularly Japanese through intermarriage (Yoo, Le and Oda 2013). Moreover, we will examine social psychological factors contributing to ethnicity related variations in substance use in our full presentation. Understanding substance use prevalence and disparities among Asian American subgroups have important implications for intervention programs on substance use disorders and a comprehensive exploration of substance use will facilitate ethnicity oriented and culturally appropriate preventive measures.

Table 1: Random Intercept Models of Substance Use (Latent), Smoking, Drinking, Marijuana, Cocaine, Methamphetamine, and Other Drugs, by Different Asian Ethnicities In the US, from Wave 1 to Wave 5; Multiple Imputation (M=5)

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**
	Sub Use (Latent)	**Smoking**	**Drinking**	**Marijuana**	**Cocaine**	**Meth**	**Other Drugs**
Link function:	*Linear*	*Logistic*	*Logistic*	*Logistic*	*Logistic*	*Logistic*	*Logistic*
Filipino	0.155***	1.781***	-0.174	0.837***	0.532	1.305	0.170
	(3.77)	(6.11)	(-1.10)	(4.31)	(1.45)	(1.94)	(0.69)
Japanese	0.295*	2.227***	0.0643	0.939*	0.964	1.409*	1.102
	(2.56)	(3.66)	(0.22)	(2.13)	(1.77)	(2.37)	(2.24)
Asian Indian	0.262	0.494	-0.0730	1.182*	1.307	0.963	1.348*
	(1.94)	(0.54)	(-0.22)	(2.25)	(1.24)	(0.89)	(2.54)
Korean	0.312**	3.085***	0.255	1.041**	1.026*	1.404	0.893*
	(3.59)	(6.25)	(1.24)	(3.04)	(2.30)	(0.91)	(2.54)
Vietnamese	0.0955	0.924	-0.242	-0.216	0.994	-0.128	0.941*
	(1.13)	(1.11)	(-0.58)	(-0.34)	(1.60)	(-0.10)	(2.25)
Other Asian	0.0840	1.993***	-0.532*	0.839***	-0.376	0.190	-0.0752
	(1.73)	(5.02)	(-2.66)	(3.35)	(-0.92)	(0.35)	(-0.29)
Multiple Asian	0.294*	2.113***	0.274	1.269***	0.953	1.212	0.816
	(2.89)	(4.33)	(1.41)	(4.12)	(2.01)	(1.90)	(0.87)
Intercept	-0.757***	-6.231***	-1.993***	-4.212***	-5.494***	-4.196*	-4.081***
	(-15.00)	(-15.53)	(-10.48)	(-16.32)	(-11.88)	(-3.51)	(-10.00)
N	7910	7910	7910	7910	7910	4746	6328
t statistics in parentheses							
="* p<0.05	** p<0.01	*** p<0.001"					

Note: All models include the following control covariates: nativity status, parental control, age, gender, parental educational attainment, and logged childhood household income. Control covariate coefficients and t statistics have been omitted for brevity. Information on Methamphetamine was unavailable in Wave I and Wave II.

Figure 1. Median splines visualizing age trajectories of substance use (latent substance use, smoking, alcohol, marijuana) by ethnicity



Data Source: The National Longitudinal Study of Adolescent to Adult Health, W1-W5, MI (M=5).
Note: Median splines (5 bands) used for visualization.

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