Camillia Lui

EXTENDED ABSTRACT

Background

Across the life course, substance use and misuse are highest in early adulthood in the United States. (Chen, Dufour and Yi 2004; Windle, Mun and Windle 2005). To address health disparities, it is critical to identify distal factors that explain risky substance use behaviors across racial, ethnic, and socioeconomic groups (Adler and Stewart 2010; Braveman et al. 2010). Link and Phelan point to social status as a "fundamental" cause for placing socially disadvantaged groups at poorer health than more socially advantaged groups (1995). However, the relationship between substance use behaviors and social status is complex during adolescence into early adulthood. Smoking is higher among lower social status groups while heavy episodic alcohol use is higher among higher social status groups (Chassin et al. 1996; Crosnoe and Riegle-Crumb 2007; Humensky 2010; Pampel and Rogers 2004). These inconsistent substance use patterns may be due to difficulty in measuring social status during this transition period or divergent life course patterns in early adulthood.

During the transition from adolescence into adulthood, the effects of social status on health are unclear (Hanson and Chen 2007). However, it is difficult to capture social status during this transition period. Most studies are limited to cross-sectional data where social status is often measured through family-ascribed characteristics (e.g., parent's occupation or education) or one-point-in-time measures (e.g., annual income in last year). Family-ascribed characteristics may not be appropriate to young adults living independently of their families. Furthermore, early adult social status is temporary given the ongoing process of status attainment—for example a relatively advantaged college student would have low apparent social status due to having low current education and low personal income. Or occupation type in adolescence or young adulthood may not be indicative of future occupation type in adulthood. Traditional social status measures may have different meanings depending on the life course stage.

Previous literature on the emerging adulthood period has highlighted two pathways of early or delayed onset of adult roles which can influence the process of social status attainment. For some young adults, the onset of typical adult roles is occurring at later ages as they delay marriage and postpone having children, pursue further schooling in place of work, and remain (to some degree) dependent on their parents (Settersten, Furstenberg and Rumbaut 2005). As the transition period lengthens, these young adults may be engaging in substance use behaviors for increasingly longer periods of their lives. For other young adults, onset of adult roles such as becoming a parent or entering the workforce is occurring at a younger age (Foster, Hagan and Brooks-Gunn 2008). Becoming an adult at a younger age has been associated with higher levels of stress and poor health behaviors (such as smoking and heavy alcohol use) to cope with the stress. The process of taking on adult roles is strongly associated with social status where early onset of adult roles is common among more disadvantaged groups and delayed onset of adult roles among more advantaged groups. With a better conceptualization of social status that captures different dimensions and pathways during this transition period, we can have a better understanding of the role of social status on substance use behaviors.

Research Aims/Hypotheses

Given this study's perspective that social status varies over time and is multidimensional, the main study objectives are to ascertain the effects of social status on substance use behaviors during the transition from adolescence to adulthood by conducting secondary data analysis of three survey waves (1995, 2001, and 2008) from the National Longitudinal Study of Adolescent Health (Add Health). Using the life course framework, this study contributes to the literature on social status and substance use behaviors by re-conceptualizing the construct of social status from adolescence into adulthood using a person-oriented framework of latent class analysis. This construct of *life-course* social status captures the ebb and flow of advantages or disadvantages across adolescence into adulthood. Furthermore, *life-course* social status is conceptualized as three distinct dimensions: economic capital, human capital, and social capital. For each of these dimensions, the main hypothesis is that a more disadvantaged *life-course* social status is associated with higher risk for smoking and a more advantaged *life-course* social status is associated with higher risk for heavy episodic drinking.

I hypothesize that people with patterns of lower *life-course* social status, such as persistent disadvantage or downward mobility, are more likely to smoke in adulthood compared to those with a higher *life-course* social status. Current smoking is strongly associated with lower social status (as measured by education, income, and working-class jobs) (Brook et al. 2008; Chassin et al. 2000; Jefferis et al. 2004) , and people who were most successful at quitting are those with higher socioeconomic status (SES) (Barbeau, Krieger and Soobader 2004). Furthermore, lower social status in childhood is related to adult smoking (Jefferis et al. 2004). However, many of these studies use a static measure of social status which may disguise the effects of cumulative advantage or disadvantage across the life course.

People with patterns of higher *life-course* social status, such as persistent advantage or upward mobility, are more likely to engage in heavy episodic drinking in adulthood. Recent studies have found heavy alcohol use among socially advantaged groups (as measured by education and income) even after controlling for college attendance (Crosnoe and Riegle-Crumb 2007; Humensky 2010). Social norms and lifestyles within certain contexts (e.g., college or work environment) can influence heavier use among socially advantaged groups (Catalano et al. 1996; Theall et al. 2009). Heavy alcohol use has also been reported among more socially disadvantaged groups in comparison to their socially advantaged groups (Gilman et al. 2008). Relative deprivation experienced among both lower and higher social status groups may be associated with higher stress levels and heavy alcohol use (Galea et al. 2007). Therefore, a non-linear effect of social status may occur with heavy alcohol use in adulthood.

Data and Methods

This study used restricted data files from Waves I, III, and IV of Add Health. Add Health includes a nationally representative sample of adolescents who were in grades 7-12 in the United States during the 1994-1995 school year and follows them into early adulthood (Harris et al. 2009). The data align well with the research questions to capture substance use behaviors and

social status across the key life stages of adolescence (Wave I), young adult (Wave III), and adulthood (Wave IV). The final sample for analysis included 9,093 respondents.

Smoking and alcohol use in adulthood (Wave IV) serve as the two outcome variables for analysis. Current smoking behaviors in adulthood were categorized into no daily smoking and daily smoking in the past 30 days. For heavy episodic drinking, respondents were asked, "During the past 12 months, on how many days did you drink [for males] 5 or more or [for females] 4 or more drinks in a row?" Responses included none, 1-2 days, once a month or less, 2-3 days per month, 1-2 days a week, and almost every day or daily. The adult heavy episodic drinking variable was created by collapsing the previous categories into: no alcohol use in the past year, alcohol use but no heavy episodic drinking in the past 30 days, and heavy episodic drinking in the past 30 days.

Guided by previous research and theory, social status is operationalized as a latent construct composed of key domains defined by material/economic capital and human capital (Krieger, Williams and Moss 1997; Oakes and Rossi 2003). Social status is measured using variables from each life stage of adolescence (including parent indicators), young adulthood, and adulthood. For each wave, comparable measures of income (parent-reported household income and respondent's personal income in young adult and adulthood), economic hardship, receipt of public assistance, and home ownership were used to conceptualize material/economic capital. Educational attainment, hours worked per week, and occupational type of parents and respondents capture the human capital domain. Within the social capital domains, organizational membership, frequency of religious involvement, number of close friends, and civic participation were assessed for both parents and respondents.

This study investigated the relationship between the three constructs of "life-course" social status on smoking and alcohol behaviors within a person-oriented framework of latent variable analysis. First, latent class analysis (LCA) is used to identify latent classes or patterns of cumulative *life-course* social status. Respondents are assumed to belong to only one class or group membership (Lanza et al. 2007). LCA can combine continuous and categorical measures to identify subgroups of individuals who are homogenous in their pattern of behavior over time in a latent categorical outcome (Ingledew, Hardy and Cooper 1995). To identify the final, stable LCA model, the Vuong-Lo-Mendell-Rubin likelihood ratio test was used to assess a *k* class model fit when compared to a *k-1* class model and the Bayesian Information Criteria (BIC) statistic is examined across models. Once the final model was determined, a distal outcome of smoking or alcohol was included into the social status latent class model. In this type of analysis, results showed the probability of endorsing daily smoking or heavy episodic drinking for each latent class. For example, the findings present the probabilities of reporting daily smoking among individuals in the most disadvantaged economic capital group, downwardly mobile group, upwardly mobile group, and the most advantaged economic capital group. Data management and descriptive statistics were conducted in Stata version 12, and the latent class analysis is conducted in Mplus software version 6. Survey weights were used to account for stratification, clustering, and unequal selection probabilities.

Results

Smoking and alcohol behaviors tend to rise and fall over the life course. Descriptive statistics from the Add Health sample supported this trend of increasing smoking and drinking behaviors from adolescence into adulthood. Yet a significant decline of these behaviors has yet to be seen. Current smoking in the past month increased from 26% in adolescence (Wave I) to 39% in adulthood (Wave IV). Heavy episodic drinking increased from adolescence at 10% to young adulthood at 25%, but then fell slightly in adulthood at 22%. Overall, the persistence of these behaviors across the life course was small where 11% of the sample reported the continuation of current smoking behaviors and 2% of the sample reported continuation of heavy episodic drinking from adolescence into adulthood. Yet when examining those engaging in the behaviors in adulthood, 14% started smoking in young adulthood and continued into adulthood, and an additional 8% started in adulthood. For alcohol, 13% engaged in monthly heavy episodic drinking in young adulthood. In comparison, 9% started and continued binge drinking from young adulthood to adulthood, and 10% started in adulthood. The transition to early adulthood clearly marks a time when substance use behaviors can become habitual and part of one's lifestyle.

Findings from the latent class analyses identified four latent classes for the domains of economic capital and social capital, and five latent classes for the domain of human capital. These latent classes captured the ebb and flow of social status advantages and disadvantages across adolescence (ages 12-17 in Wave I), young adulthood (ages 18-26 in Wave III), and adulthood (ages 24-32 in Wave IV).

Within the economic capital domain, 17% of respondents were classified in the most economically disadvantaged group, 28% in the downwardly mobile group, 20% in the upwardly mobile group, and 35% in the most economically advantaged group. Class distinction is most apparent with household income in adolescence (W1), personal income in adulthood (W4), and indicators of economic hardship and public assistance from adolescence into adulthood.
The five classes for the human capital domain were most differentiated by education levels of parents and adult respondents as well as by mother's work status (working or not working). Overall, respondents' education levels were similar to that of their parents. One-fifth of respondents were classified in the persistently low human capital group (characterized by education levels of parent and adult respondent were both low and a working mother in adolescence), 20% in the upwardly low group (where adult respondents had slightly higher education levels than parents and a non-working mother in adolescence), 30% in the upwardly medium group (characterized by higher education levels of respondents than both their parents and a working mother), 10% in the upwardly high group (where education levels of parent and adult respondent were both high and a non-working mother in adolescence), and 19% in the persistently high group (characterized by having the highest levels of education and a working mother in adolescence). The most salient indicators of social capital include organizational or voluntary memberships and religious participation. One quarter of respondents fell into the persistently low social capital group (low levels of religious participation and low levels of organizational membership throughout the life course), followed by 31% in the downward social capital group (a high level of adolescent religious participation and low level organizational participation, with religious participation tending to fall off by adulthood), 16% in the stable

medium social capital group (with a low level of religious participation that increases slightly by adulthood and a high level of organizational membership), and 27% in the persistently high social capital group (characterized by high levels of religious participation and high levels of organizational membership throughout the life course).

To address the primary study aim of the effects of "life-course" social status on smoking and alcohol behaviors in adulthood, two Wave IV outcomes were used: daily smoking and monthly heavy episodic drinking. Twenty-four percent and 22% engaged in daily smoking and monthly heavy episodic drinking in adulthood, respectively. Findings from the latent class analysis supported the hypothesis that lower "life-course" social status has a higher association with adult daily smoking. For each of the social status domains, the most economically disadvantaged group (37%), the two lowest human capital groups (30% and 42%, respectively), and the lowest social capital group (37%) all reported the highest daily smoking prevalences. Furthermore, a clear social gradient is evident where there is a decrease in smoking prevalence from low social status groups to high social status groups.

The second hypothesis that lower "life-course" social status is associated with lower engagement in heavy episodic alcohol use in adulthood was only partially supported. The most economically disadvantaged group and the lowest human capital group reported the lowest prevalence of monthly heavy episodic drinking (15% and 17%, respectively). However, contrary to the hypothesis, the lowest social capital group reported the highest prevalence of monthly heavy episodic drinking at 26%. Furthermore, there is no clear social gradient with heavy episodic drinking. Rather, there is a different pattern of heavy episodic drinking for each of the social status domains, suggesting a complex picture that may be difficult to disaggregate. Respondents with higher adolescent economic capital (i.e., the most economically advantaged group and the downwardly mobile group) have larger endorsements of heavy episodic drinking (27% and 24%, respectively), perhaps confirming other research suggesting that adolescence is particularly important in the development of problem drinking. For human capital, all groups except for the upwardly low human capital group have similar drinking prevalences (between 22-25%), possibly reflecting both a protective effect of maternal monitoring in low education families and a culture of heavy episodic drinking during higher education. Finally, the effect of social capital on monthly heavy episodic drinking may reflect religious participation more than organizational memberships or civic participation. The group with the highest social capital (and the highest religious participation) reported the lowest drinking prevalence at 12%. All other groups reported similar drinking prevalences (between 24-26%). In summary, "life-course" social status differentially influences smoking and alcohol behaviors.

REFERENCES

Adler, N.and J. Stewart. 2010. "Health disparities across the lifespan: meaning, methods, and mechanisms." *Ann N Y Acad Sci* 1186:5-23.
Barbeau, E.M., N. Krieger, and M.J. Soobader. 2004. "Working class matters: Socioeconomic disadvantage, race/ethnicity, gender, and smoking in NHIS 2000." *American Journal of Public Health* 94(2):269-278.
Braveman, P.A., C. Cubbin, S. Egerter, D.R. Williams, and E. Pamuk. 2010. "Socioeconomic Disparities in Health in the United States: What the Patterns Tell Us." *Am J Public Health* 100(S1):S186-196.
Brook, D.W., J.S. Brook, C.S. Zhang, M. Whiteman, P. Cohen, and S.J. Finch. 2008. "Developmental trajectories of cigarette smoking from adolescence to the early thirties: Personality and behavioral risk factors." *Nicotine & Tobacco Research* 10(8):1283-1291.
Catalano, R.F., R. Kosterman, J.D. Hawkins, M.D. Newcomb, and R.D. Abbott. 1996. "Modeling the etiology of adolescent substance use: A test of the social development model." *Journal of Drug Issues* 26(2):429-455.
Chassin, L., C.C. Presson, S.C. Pitts, and S.J. Sherman. 2000. "The natural history of cigarette smoking from adolescence to adulthood in a midwestern community sample: Multiple trajectories and their psychosocial correlates." *Health Psychology* 19(3):223-231.
Chassin, L., C.C. Presson, J.S. Rose, and S.J. Sherman. 1996. "The natural history of cigarette smoking from adolescence to adulthood: Demographic predictors of continuity and change." *Health Psychology* 15(6):478-484.
Chen, C.M., M.C. Dufour, and H.Y. Yi. 2004. "Alcohol consumption among young adults ages 18-24 in the United States: Results from the 2001-2002 NESARC." *Alcohol Research & Health* 28(4):269-280.
Crosnoe, R.and C. Riegle-Crumb. 2007. "A life course model of education and alcohol use." *Journal of Health and Social Behavior* 48(3):267-282.
Foster, H., J. Hagan, and J. Brooks-Gunn. 2008. "Growing up fast: Stress exposure and subjective 'weathering' in emerging adulthood." *Journal of Health and Social Behavior* 49(2):162-177.
Galea, S., J. Ahern, M. Tracy, S. Rudenstine, and D. Vlahov. 2007. "Education inequality and use of cigarettes, alcohol, and marijuana." *Drug and Alcohol Dependence* 90(S1):S4-S15.
Gilman, S.E., J. Breslau, K.J. Conron, K.C. Koenen, S.V. Subramanian, and A.M. Zaslavsky. 2008. "Education and race-ethnicity differences in the lifetime risk of alcohol dependence." *Journal of Epidemiology and Community Health* 62(3):224-230.
Hanson, M.and E. Chen. 2007. "Socioeconomic status and health behaviors in adolescence: a review of the literature." *J Behav Med* 30(3):263-285.
Harris, K.M., C.T. Halpern, E. Whitsel, J. Hussey, J. Tabor, P. Entzel, and J.R. Udry. 2009. "The National Longitudinal Study of Adolescent Health: Research Design. 2009.".
Humensky, J.L. 2010. "Are adolescents with high socioeconomic status more likely to engage in alcohol and illicit drug use in early adulthood?" *Substance Abuse Treatment Prevention and Policy* 5:10.
Ingledew, D.K., L. Hardy, and C.L. Cooper. 1995. "Latent class analysis applied to health behaviors." *Personality and Individual Differences* 19(1):13-20.
Jefferis, B., C. Power, H. Graham, and O. Manor. 2004. "Effects of childhood socioeconomic circumstances on persistent smoking." *American Journal of Public Health* 94(2):279-285.
Krieger, N., D.R. Williams, and N.E. Moss. 1997. "Measuring social class in US public health research: Concepts, methodologies, and guidelines." *Annual Review of Public Health* 18:341-378.
Lanza, S.T., L.M. Collins, D.R. Lemmon, and J.L. Schafer. 2007. "PROC LCA: A SAS procedure for latent class analysis." *Structural Equation Modeling-a Multidisciplinary Journal* 14:671-694.
Link, B.G.and J. Phelan. 1995. "Social Conditions as Fundamental Causes of Disease " *Journal of Health and Social Behavior*:80-94.
Oakes, J.M.and P.H. Rossi. 2003. "The measurement of SES in health research: current practice and steps toward a new approach." *Social Science & Medicine* 56(4):769-784.

Pampel, F.C.and R.G. Rogers. 2004. "Socioeconomic status, smoking, and health: A test of competing theories of cumulative advantage." *Journal of Health and Social Behavior* 45(3):306-321.
Settersten, R.A., F.F. Furstenberg, and R.G. Rumbaut. 2005. *On the frontier of adulthood : theory, research, and public policy*. Chicago, Ill.: University of Chicago Press.
Theall, K.P., W. DeJong, R. Scribner, K. Mason, S.K. Schneider, and N. Simonsen. 2009. "Social Capital in the College Setting: The Impact of Participation in Campus Activities on Drinking and Alcohol-Related Harms." *Journal of American College Health* 58(1):15-23.
Windle, M., E.Y. Mun, and R.C. Windle. 2005. "Adolescent-to-young adulthood heavy drinking trajectories and their prospective predictors." *Journal of Studies of Alcohol* 66(3):313-322.