

## DESPR – News

As a grantee or applicant for research support from the Division of Epidemiology, Services, and Prevention Research (DESPR) of NIDA, we thought you would like to have an ongoing update of the news from the division. We will be sending out a newsletter letter 3 times per year around the time of National Advisory Council on Drug Abuse meetings. Copies of the DESPR - NIDA News will be archived and available for viewing in the future.

### Research Highlights

As part of NIDA's preparation for the Council meetings, each NIDA division sends to the Institute Director a compilation of the highlights of recent Division supported published research which exemplifies some of the important and diverse work supported by the division. In the future, this newsletter will include a link to an online archive of the current and previous DESPR research highlights. For this issue, the current highlighted research findings are included at the end of the newsletter.

### Council Meetings

Each NIDA Council meeting has both open and closed sessions. The closed sessions include discussions of confidential information related to grant applications and are therefore closed to the public. The open sessions are public and include a report by the Institute Director as well as presentations and discussions of research and programmatic issues that are likely to be of interest to the research community. These open sessions can be attended in person or viewed remotely. The next NIDA Council meeting is scheduled for September 6, 2017. The agenda and viewing information will be available approximately a week before the Council meeting at: <https://www.drugabuse.gov/about-nida/advisory-boards-groups/national-advisory-council-drug-abuse-nacda/national-advisory-council-agenda>

The mission of the National Institutes of Health (NIH) partnership, *Collaborative Research on Addiction at NIH (CRAN)*, is to provide a strong collaborative framework to enable the National Institute on Alcohol Abuse and Alcoholism (NIAAA), the National Institute on Drug Abuse (NIDA), and the National Cancer Institute (NCI) to integrate resources and expertise to advance substance use, abuse, and addiction research and public health outcomes. You can find out more about CRAN at: <https://addictionresearch.nih.gov/>. Videocasts of the once yearly previous CRAN Council meetings including the most recent meeting can be found at: <https://videocast.nih.gov/Summary.asp?File=23265&bhcp=1>

DESPR Research Interests DESPR's mission is to advance solutions for drug addiction. DESPR is looking for research solutions to these questions:

- What personal environmental influences contribute to substance use patterns?
- How does technology contribute to substance use and addiction?
- How can we get more large systems of care to adopt evidence based interventions?
- How can we promote population neuroscience?
- How can we minimize the risk of addiction to opioid analgesics among people suffering from pain?
- How can we better promote evidence based screening and treatment of HIV related to drug use?

If you would like more information about the research interests and staff contacts for DESPR, please visit our web page:

<https://www.drugabuse.gov/about-nida/organization/divisions/division-epidemiology-services-prevention-research-despr>

#### Recent Medication Assisted Treatment for Opioid Use Disorder RFA

You may also be interested in a recent RFA, [RFA-DA-18-005](#) "Expanding Medication Assisted Treatment for Opioid Use Disorders in the Context of the SAMHSA Opioid STR Grants (R21/R33)" which seeks applications proposing to test approaches for expanding medication assisted treatment (MAT) for opioid use disorder (OUD) in the general health care sector or linking individuals with OUDs who receive naloxone for the reversal of overdose to MAT in the context of states' plans for use of the funds authorized under the 21st Century Cures Act. Applications are due June 20, 2017.

#### Small Business Support Programs

DESPR is interested in supporting research and development through the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. These programs allow US-owned and operated small businesses to engage in federal research and development that has a strong potential for commercialization. For more information on NIDA's SBIR/STTR programs, go to [https://www.sbir.nih.gov/nida/index\\_](https://www.sbir.nih.gov/nida/index_)

#### Mailing List Membership

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DESPR Research Findings for the Director's Report to Council 5-2017

#### **Deficits In Autonomic Indices Of Emotion Regulation And Reward Processing Associated With Prescription Opioid Use And Misuse.**

Garland, Eric L; Bryan, Craig J; Nakamura, Yoshio; Froeliger, Brett; Howard, Matthew O. *Psychopharmacology (Berl)*. 2017; 234(4): 621-629.

Prescription opioid misuse and high-dose opioid use may result in allostatic dysregulation of hedonic brain circuitry, leading to reduced emotion regulation capacity. In particular, opioid misuse may blunt the ability to experience and upregulate positive affect from natural rewards. The purpose of this study was to examine associations between opioid use/misuse and autonomic indices of emotion regulation capability in a sample of chronic pain patients receiving prescription opioid pharmacotherapy. Chronic pain patients taking long-term opioid analgesics (N = 40) completed an emotion regulation task while heart rate variability (HRV) was recorded, and also completed self-report measures of opioid misuse, craving, pain severity, and emotional distress. Based on a validated cut-point on the Current Opioid Misuse Measure, participants were grouped as opioid misusers or non-misusers. Opioid misuse status and morphine equivalent daily dose (MEDD) were examined as predictors of HRV and self-reports of emotion regulation. Opioid misusers exhibited significantly less HRV during positive and negative emotion regulation, and significantly less positive effect, than non-misusers, after controlling for confounders including pain severity and emotional distress. MEDD was inversely associated with positive emotion regulation efficacy. Findings implicate the presence of reward processing

deficits among chronic pain patients with opioid-misusing behaviors, and opioid dosage was associated with deficient emotion regulation, suggesting the presence of compromised top-down cognitive control over bottom-up hedonic processes. Emotion regulation among opioid misusers may represent an important treatment target

### **Association Between Initial Opioid Prescribing Patterns And Subsequent Long-Term Use Among Opioid-Naïve Patients: A Statewide Retrospective Cohort Study.**

Deyo, Richard A; Hallvik, Sara E; Hildebran, Christi; Marino, Miguel; Dexter, Eve; Irvine, Jessica M; O'Kane, Nicole; Van Otterloo, Joshua; Wright, Dagan A; Leichtling, Gillian; Millet, Lisa M. *J Gen Intern Med.* 2017; 32(1): 21-27.

Long-term efficacy of opioids for non-cancer pain is unproven, but risks argue for cautious prescribing. Few data suggest how long or how much opioid can be prescribed for opioid-naïve patients without inadvertently promoting long-term use. To examine the association between initial opioid prescribing patterns and likelihood of long-term use among opioid-naïve patients. Retrospective cohort study; data from Oregon resident prescriptions linked to death certificates and hospital discharges. Patients filling opioid prescriptions between October 1, 2012, and September 30, 2013, with no opioid fills for the previous 365 days. Subgroup analyses examined patients under age 45 who did not die in the follow-up year, excluding most cancer or palliative care patients. Exposure: Numbers of prescription fills and cumulative morphine milligram equivalents (MMEs) dispensed during 30 days following opioid initiation ("initiation month"). Proportion of patients with six or more opioid fills during the subsequent year ("long-term users"). There were 536,767 opioid-naïve patients who filled an opioid prescription. Of these, 26,785 (5.0 %) became long-term users. Numbers of fills and cumulative MMEs during the initiation month were associated with long-term use. Among patients under age 45 using short-acting opioids who did not die in the follow-up year, the adjusted odds ratio (OR) for long-term use among those receiving two fills versus one was 2.25 (95 % CI: 2.17, 2.33). Compared to those who received < 120 total MMEs, those who received between 400 and 799 had an OR of 2.96 (95 % CI: 2.81, 3.11). Patients initiating with long-acting opioids had a higher risk of long-term use than those initiating with short-acting drugs. Early opioid prescribing patterns are associated with long-term use. While patient characteristics are important, clinicians have greater control over initial prescribing. Our findings may help minimize the risk of inadvertently initiating long-term opioid use.

### **State Medical Marijuana Laws And The Prevalence Of Opioids Detected Among Fatally Injured Drivers.**

Kim, June H; Santaella-Tenorio, Julian; Mauro, Christine; Wrobel, Julia; Cerdà, Magdalena; Keyes, Katherine M; Hasin, Deborah; Martins, Silvia S; Li, Guohua. *Am J Public Health.* 2016; 106(11): 2032-2037.

To assess the association between medical marijuana laws (MMLs) and the odds of a positive opioid test, an indicator for prior use. We analyzed 1999-2013 Fatality Analysis Reporting System (FARS) data from 18 states that tested for alcohol and other drugs in at least 80% of drivers who died within 1 hour of crashing (n = 68 394). Within-state and between-state comparisons assessed opioid positivity among drivers crashing in states with an operational MML (i.e., allowances for home cultivation or active dispensaries) versus drivers crashing in states before a future MML was operational. State-specific estimates indicated a reduction in opioid positivity for most states after implementation of an operational MML, although none of these estimates were significant. When we combined states, we observed no significant overall association (odds ratio [OR] = 0.79; 95% confidence interval [CI] = 0.61, 1.03). However, age-stratified analyses indicated a significant reduction in opioid positivity for drivers aged 21 to 40 years (OR = 0.50; 95% CI = 0.37, 0.67; interaction P < .001). Operational MMLs are associated

with reductions in opioid positivity among 21- to 40-year-old fatally injured drivers and may reduce opioid use and overdose.

### **US Traffic Fatalities, 1985-2014, And Their Relationship To Medical Marijuana Laws.**

Santaella-Tenorio, Julian; Mauro, Christine M; Wall, Melanie M; Kim, June H; Cerdá, Magdalena; Keyes, Katherine M; Hasin, Deborah S; Galea, Sandro; Martins, Silvia S. *Am J Public Health.* 2017; 107(2): 336-342.

To determine the association of medical marijuana laws (MMLs) with traffic fatality rates. Using data from the 1985-2014 Fatality Analysis Reporting System, we examined the association between MMLs and traffic fatalities in multilevel regression models while controlling for contemporaneous secular trends. We examined this association separately for each state enacting MMLs. We also evaluated the association between marijuana dispensaries and traffic fatalities. On average, MML states had lower traffic fatality rates than non-MML states. Medical marijuana laws were associated with immediate reductions in traffic fatalities in those aged 15 to 24 and 25 to 44 years, and with additional yearly gradual reductions in those aged 25 to 44 years. However, state-specific results showed that only 7 states experienced post-MML reductions. Dispensaries were also associated with traffic fatality reductions in those aged 25 to 44 years. Both MMLs and dispensaries were associated with reductions in traffic fatalities, especially among those aged 25 to 44 years. State-specific analysis showed heterogeneity of the MML-traffic fatalities association, suggesting moderation by other local factors. These findings could influence policy decisions on the enactment or repealing of MMLs and how they are implemented.

### **The Costs Of Crime During And After Publicly-funded Treatment For Opioid Use Disorders: A Population-level Study For The State Of California.**

Krebs, Emanuel; Urada, Darren; Evans, Elizabeth; Huang, David; Hser, Yih-Ing; Nosyk, Bohdan. *Addiction.* 2017; 112(5):838-851.

Treatment for opioid use disorders (OUD) reduces the risk of mortality and infectious disease transmission; however, opportunities to quantify the potential economic benefits of associated decreases in drug-related crime are scarce. This paper aimed to estimate the costs of crime during and after periods of engagement in publicly-funded treatment for OUD to compare total costs of crime over a hypothetical 6-month period following initiation of opioid agonist treatment (OAT) versus detoxification. Retrospective, administrative data-based cohort study with comprehensive information on drug treatment and criminal justice systems interactions. Publicly-funded drug treatment facilities in California, USA (2006-2010). 31,659 individuals admitted for the first time to treatment for OUD, and who were linked with criminal justice and mortality data, were followed during a median 2.3 years. Median age at first treatment admission was 32, 35.8% were women, and 37.1% primarily used prescription opioids. Daily costs of crime (2014\$US) were calculated from a societal perspective and were composed of the costs of policing, court, corrections, and criminal victimization. We estimated the average marginal effect of treatment engagement in OAT or detoxification adjusting for potential fixed and time-varying confounders, including drug use and criminal justice system involvement prior to treatment initiation. Daily costs of crime during treatment compared with after treatment were \$126 lower for OAT (95% CI: \$116, \$136) and \$144 lower for detoxification (\$135, \$154). Summing the costs of crime during and after treatment over a hypothetical 6-month period using the observed median durations of OAT (161 days) and detoxification (19 days), we estimated that enrolling an individual in OAT as opposed to detoxification would save \$17,550 (\$16,840, \$18,383). In publicly-funded drug treatment facilities in California USA, engagement in treatment for opioid use disorders is associated with lower costs of crime in the six months following initiation of treatment, and the economic benefits were far greater for individuals receiving time-unlimited treatment.

### **Criminally Involved Parents Who Misuse Substances And Children's Odds Of Being Arrested As A Young Adult: Do Drug Treatment Courts Mitigate The Risk?**

Gifford, Elizabeth J; Eldred, Lindsey M; Evans, Kelly E; Sloan, Frank A. *J Child Fam Stud.* 2016; 25(8): 2447-2457.

This paper examined (1) the association between parents who are convicted of a substance-related offense and their children's probability of being arrested as a young adult and (2) whether or not parental participation in an adult drug treatment court program mitigated this risk. The analysis relied on state administrative data from North Carolina courts (2005-2013) and from birth records (1988-2003). The dependent variable was the probability that a child was arrested as a young adult (16-21). Logistic regression was used to compare groups and models accounted for the clustering of multiple children with the same mother. Findings revealed that children whose parents were convicted on either a substance-related charge or a non-substance-related charge had twice the odds of being arrested as young adults, relative to children whose parents had not been observed having a conviction. While a quarter of children whose parents participated in a drug treatment court program were arrested as young adults, parental completion of this program did not reduce this risk. In conclusion, children whose parents were convicted had an increased risk of being arrested as young adults, irrespective of whether or not the conviction was on a substance-related charge. However, drug treatment courts did not reduce this risk. Reducing intergenerational links in the probability of arrest remains a societal challenge.

### **The Dynamics Of Internalizing And Externalizing Comorbidity Across The Early School Years.**

Willner, Cynthia J; Gatzke-Kopp, Lisa M; Bray, Bethany C. *Dev Psychopathol.* 2016; 28(4pt1): 1033-1052.

High rates of comorbidity are observed between internalizing and externalizing problems, yet the developmental dynamics of comorbid symptom presentations are not yet well understood. This study explored the developmental course of latent profiles of internalizing and externalizing symptoms across kindergarten, first grade, and second grade. The sample consisted of 336 children from an urban, low-income community, selected based on relatively high (61%) or low (39%) aggressive/oppositional behavior problems at school entry (64% male; 70% African American, 20% Hispanic). Teachers reported on children's symptoms in each year. An exploratory latent profile analysis of children's scores on aggression/oppositionality, hyperactivity/inattention, anxiety, and social withdrawal symptom factors revealed four latent symptom profiles: comorbid (48% of the sample in each year), internalizing (19%-23%), externalizing (21%-22%), and well-adjusted (7%-11%). The developmental course of these symptom profiles was examined using a latent transition analysis, which revealed remarkably high continuity in the comorbid symptom profile (89% from one year to the next) and moderately high continuity in both the internalizing and externalizing profiles (80% and 71%, respectively). Internalizing children had a 20% probability of remitting to the well-adjusted profile by the following year, whereas externalizing children had a 25% probability of transitioning to the comorbid profile. These results are consistent with the hypothesis that a common vulnerability factor contributes to developmentally stable internalizing-externalizing comorbidity, while also suggesting that some children with externalizing symptoms are at risk for subsequently accumulating internalizing symptoms.

### **The Long-term Effectiveness Of The Family Check-Up On School-age Conduct Problems: Moderation By Neighborhood Deprivation.**

Shaw, Daniel S; Sitnick, Stephanie L; Brennan, Laretta M; Choe, Daniel E; Dishion, Thomas J; Wilson, Melvin N; Gardner, Frances. *Dev Psychopathol.* 2016; 28(4pt2): 1471-1486.

Several studies suggest that neighborhood deprivation is a unique risk factor in child and adolescent development of problem behavior. We sought to examine whether previously

established intervention effects of the Family Check-Up (FCU) on child conduct problems at age 7.5 would persist through age 9.5, and whether neighborhood deprivation would moderate these effects. In addition, we examined whether improvements in parent-child interaction during early childhood associated with the FCU would be related to later reductions in child aggression among families living in the highest risk neighborhoods. Using a multisite cohort of at-risk children identified on the basis of family, child, and socioeconomic risk and randomly assigned to the FCU, intervention effects were found to be moderated by neighborhood deprivation, such that they were only directly present for those living at moderate versus extreme levels of neighborhood deprivation. In addition, improvements in child aggression were evident for children living in extreme neighborhood deprivation when parents improved the quality of their parent-child interaction during the toddler period (i.e., moderated mediation). Implications of the findings are discussed in relation to the possibilities and possible limitations in prevention of early problem behavior for those children living in extreme and moderate levels of poverty.

### **[A Bivariate Genetic Analysis Of Drug Abuse Ascertained Through Medical And Criminal Registries In Swedish Twins, Siblings And Half-Siblings.](#)**

Maes, Hermine H; Neale, Michael C; Ohlsson, Henrik; Zahery, Mahsa; Lichtenstein, Paul; Sundquist, Kristina; Sundquist, Jan; Kendler, Kenneth S. *Behav Genet.* 2016; 46(6): 735-741. Using Swedish nationwide registry data, the authors investigated the correlation of genetic and environmental risk factors in the etiology of drug abuse as ascertained from medical and criminal registries by modeling twin and sibling data. Medical drug abuse was defined using public inpatient and outpatient records, while criminal drug abuse was ascertained through legal records. Twin, full and half sibling pairs were obtained from the national twin and genealogical registers. Information about sibling pair residence within the same household was obtained from Statistics Sweden. Standard bivariate genetic structural equation modeling was applied to the population-based data on drug abuse ascertained through medical and crime registries, using OpenMx. Analyses of all possible pairs of twins (MZ: N = 4482; DZ: N = 9838 pairs), full- (N = 1,278,086) and half-siblings (paternal: N = 7767; maternal N = 70,553) who grew up together suggested that factors explaining familial resemblance for drug abuse as defined through medical or criminal registries were mostly the same. Results showed substantial heritability and moderate contributions of shared environmental factors to drug abuse; both were higher in males versus females, and higher for drug abuse ascertained through criminal than medical records. Because of the low prevalence of both assessments of drug abuse, having access to population data was crucial to obtain stable estimates. Using objective registry data, the authors found that drug abuse—whether ascertained through medical versus criminal records—was highly heritable. Furthermore, shared environmental factors contributed significantly to the liability of drug abuse. Genetic and shared environmental risk factors for these two forms of drug abuse were highly correlated.

### **[Persistent Cannabis Dependence And Alcohol Dependence Represent Risks For Midlife Economic And Social Problems: A Longitudinal Cohort Study.](#)**

Cerdá, Magdalena; Moffitt, Terrie E; Meier, Madeline H; Harrington, HonaLee; Houts, Renate; Ramrakha, Sandhya; Hogan, Sean; Poulton, Richie; Caspi, Avshalom. *Clin Psychol Sci.* 2016; 4(6): 1028-1046.

With the increasing legalization of cannabis, understanding the consequences of cannabis use is particularly timely. We examined the association between cannabis use and dependence, prospectively assessed between ages 18-38, and economic and social problems at age 38. We studied participants in the Dunedin Longitudinal Study, a cohort (n=1,037) followed from birth to age 38. Study members with regular cannabis use and persistent dependence experienced downward socioeconomic mobility, more financial difficulties, workplace problems, and relationship conflict in early midlife. Cannabis dependence was not linked to traffic-related convictions. Associations were not explained by socioeconomic adversity, childhood

psychopathology, achievement orientation, or family structure; cannabis-related criminal convictions; early onset of cannabis dependence; or comorbid substance dependence. Cannabis dependence was associated with more financial difficulties than alcohol dependence; no difference was found in risks for other economic or social problems. Cannabis dependence is not associated with fewer harmful economic and social problems than alcohol dependence.

### **Antisocial Peer Affiliation And Externalizing Disorders: Evidence For Gene × Environment × Development Interaction.**

Samek, Diana R; Hicks, Brian M; Keyes, Margaret A; Iacono, William G; McGue, Matt. *Dev Psychopathol.* 2017; 29(1): 155-172.

Gene × Environment interaction contributes to externalizing disorders in childhood and adolescence, but little is known about whether such effects are long lasting or present in adulthood. We examined gene-environment interplay in the concurrent and prospective associations between antisocial peer affiliation and externalizing disorders (antisocial behavior and substance use disorders) at ages 17, 20, 24, and 29. The sample included 1,382 same-sex twin pairs participating in the Minnesota Twin Family Study. We detected a Gene × Environment interaction at age 17, such that additive genetic influences on antisocial behavior and substance use disorders were greater in the context of greater antisocial peer affiliation. This Gene × Environment interaction was not present for antisocial behavior symptoms after age 17, but it was for substance use disorder symptoms through age 29 (though effect sizes were largest at age 17). The results suggest adolescence is a critical period for the development of externalizing disorders wherein exposure to greater environmental adversity is associated with a greater expression of genetic risk. This form of Gene × Environment interaction may persist through young adulthood for substance use disorders, but it appears to be limited to adolescence for antisocial behavior.

### **Risk Factors For Substance Misuse And Adolescents' Symptoms Of Depression.**

Siennick, Sonja E; Widdowson, Alex O; Woessner, Mathew K; Feinberg, Mark E; Spoth, Richard L. *J Adolesc Health.* 2017; 60(1): 50-56.

Depressive symptoms during adolescence are positively associated with peer-related beliefs, perceptions, and experiences that are known risk factors for substance misuse. These same risk factors are targeted by many universal substance misuse prevention programs. This study examined whether a multicomponent universal substance misuse intervention for middle schoolers reduced the associations between depressive symptoms, these risk factors, and substance misuse. The study used data from a place-randomized trial of the Promoting School-Community-University Partnerships to Enhance Resilience model for delivery of evidence-based substance misuse programs for middle schoolers. Three-level within-person regression models were applied to four waves of survey, and social network data from 636 adolescents followed from sixth through ninth grades. When adolescents in control school districts had more symptoms of depression, they believed more strongly that substance use had social benefits, perceived higher levels of substance misuse among their peers and friends, and had more friends who misused substances, although they were not more likely to use substances themselves. Many of the positive associations of depressive symptoms with peer-related risk factors were significantly weaker or not present among adolescents in intervention school districts. The Promoting School-Community-University Partnerships to Enhance Resilience interventions reduced the positive associations of adolescent symptoms of depression with peer-related risk factors for substance misuse.

### **Demographic Trends Among Older Cannabis Users In The United States, 2006-13.**

Han, Benjamin H; Sherman, Scott; Mauro, Pia M; Martins, Silvia S; Rotenberg, James; Palamar, Joseph J. *Addiction.* 2017; 112(3): 516-525.

The ageing US population is providing an unprecedented population of older adults who use recreational drugs. We aimed to estimate the trends in the prevalence of past-year use of cannabis, describe the patterns and attitudes and determine correlates of cannabis use by adults age 50 years and older. Secondary analysis of the National Survey on Drug Use and Health survey from 2006 to 2013, a cross-sectional survey given to a nationally representative probability sample of populations living in US households. USA. A total of 47 140 survey respondents aged  $\geq 50$  years. Estimates and trends of past-year use of cannabis. The prevalence of past-year cannabis use among adults aged  $\geq 50$  increased significantly from 2006/07 to 2012/13, with a 57.8% relative increase for adults aged 50-64 (linear trend  $P < 0.001$ ) and a 250% relative increase for those aged  $\geq 65$  (linear trend  $P = 0.002$ ). When combining data from 2006 to 2013, 6.9% of older cannabis users met criteria for cannabis abuse or dependence, and the majority of the sample reported perceiving no risk or slight risk associated with monthly cannabis use (85.3%) or weekly use (79%). Past-year users were more likely to be younger, male, non-Hispanic, not have multiple chronic conditions and use tobacco, alcohol or other drugs compared with non-past-year cannabis users. The prevalence of cannabis use has increased significantly in recent years among US adults aged  $\geq 50$  years.

### **Glucocorticoid Receptor (NR3C1) Gene Polymorphism Moderate Intervention Effects On The Developmental Trajectory Of African-American Adolescent Alcohol Abuse.**

Zheng, Yao; Albert, Dustin; McMahon, Robert J; Dodge, Kenneth; Dick, Danielle; Conduct Problems Prevention Research Group. *Prev Sci.* 2016; Nov. 6.

Accumulative evidence from recent genotype  $\times$  intervention studies suggests that individuals carrying susceptible genotypes benefit more from intervention and provides one avenue to identify subgroups that respond differentially to intervention. This study examined the moderation by glucocorticoid receptor (NR3C1) gene variants of intervention effects on the developmental trajectories of alcohol abuse through adolescence. Participants were randomized into Fast Track intervention and control groups self-reported past-year alcohol abuse annually from grade 7 through 2 years post-high school and provided genotype data at age 21 (69% males; European Americans [EAs] = 270, African-Americans [AAs] = 282). Latent growth curve models were fit to examine developmental trajectories of alcohol abuse. The interactions of 10 single nucleotide polymorphisms (SNPs) in NR3C1 with intervention were examined separately. Both EAs and AAs showed significant increases in past-year alcohol abuse with substantial inter-individual differences in rates of linear growth. AAs showed lower general levels and slower rates of linear growth than EAs. Adjusting for multiple tests, one NR3C1 SNP (rs12655166) significantly moderated intervention effects on the developmental trajectories of alcohol abuse among AAs. Intervention effects on the rates of linear growth were stronger among AAs carrying minor alleles than those not carrying minor alleles. The findings highlight the importance of taking a developmental perspective on adolescent alcohol use and have implications for future intervention design and evaluation by identifying subgroups that could disproportionately benefit from intervention.

### **Randomized Trial Of Parent Training To Prevent Adolescent Problem Behaviors During The High School Transition.**

Mason, W Alex; Fleming, Charles B; Gross, Thomas J; Thompson, Ronald W; Parra, Gilbert R; Haggerty, Kevin P; Snyder, James J. *J Fam Psychol.* 2016; 30(8): 944-954.

This randomized controlled trial tested a widely used general parent training program, Common Sense Parenting (CSP), with low-income 8th graders and their families to support a positive transition to high school. The program was tested in its original 6-session format and in a modified format (CSP-Plus), which added 2 sessions that included adolescents. Over 2 annual cohorts, 321 families were enrolled and randomly assigned to either the CSP, CSP-Plus, or minimal-contact control condition. Pretest, posttest, 1-year follow-up, and 2-year follow-up



survey data on parenting as well as youth school bonding, social skills, and problem behaviors were collected from parents and youth (94% retention). Extending prior examinations of posttest outcomes, intent-to-treat regression analyses tested for intervention effects at the 2 follow-up assessments, and growth curve analyses examined experimental condition differences in yearly change across time. Separate exploratory tests of moderation by youth gender, youth conduct problems, and family economic hardship also were conducted. Out of 52 regression models predicting 1- and 2-year follow-up outcomes, only 2 out of 104 possible intervention effects were statistically significant. No statistically significant intervention effects were found in the growth curve analyses. Tests of moderation also showed few statistically significant effects. Because CSP already is in widespread use, findings have direct implications for practice. Specifically, findings suggest that the program may not be efficacious with parents of adolescents in a selective prevention context and may reveal the limits of brief, general parent training for achieving outcomes with parents of adolescents. (PsycINFO Database Record

### **Risky Driving And Sexual Behaviors As Developmental Outcomes Of Co-occurring Substance Use And Antisocial Behavior.**

Luk, Jeremy W; Worley, Matthew J; Winiger, Evan; Trim, Ryan S; Hopfer, Christian J; Hewitt, John K; Brown, Sandra A; Wall, Tamara L. *Drug Alcohol Depend.* 2016; 169: 19-25.

To examine the associations between substance use and antisocial behavior trajectories and seven risky behaviors over time. Data were collected from a high-risk sample of adolescents followed into young adulthood. Five trajectory classes, identified based on dual development of substance use and antisocial behavior symptoms, were used to predict three risky driving and four risky sexual behaviors. In this high-risk sample (n=530), participants reported notably high overall rates of reckless driving (55.5%) and unprotected sex under the influence (44.8%) in the past year. Risky behaviors that are typically of low base rates in population-based studies were also elevated, with 8.8% reporting past-year driving under the influence (DUI) charge, 17.6% reporting lifetime sexually transmitted infection (STI), and 10.4% reporting lifetime injection drug use. The Dual Chronic class had the highest levels of all seven risky behaviors, and were 3-4 times more likely to report risky driving, lifetime STI, and injection drug use than the Relatively Resolved class. Rates of past-year reckless driving and DUI were elevated among classes with persistent antisocial behavior, whereas rates of DUI, DUI charge, and unprotected sex under the influence were elevated among classes with persistent substance use. Young adults with persistent co-occurring substance use and antisocial behavior engage in multiple very costly risky behaviors. Differential associations between risky behaviors and trajectory classes highlight the need for targeted interventions.

### **Non-medical Use Of Prescription Opioids Is Associated With Heroin Initiation Among US Veterans: A Prospective Cohort Study.**

Banerjee, Geetanjali; Edelman, E Jennifer; Barry, Declan T; Becker, William C; Cerdá, Magdalena; Crystal, Stephen; Gaither, Julie R; Gordon, Adam J; Gordon, Kirsha S; Kerns, Robert D; Martins, Silvia S; Fiellin, David A; Marshall, Brandon D L. *Addiction.* 2016; 111(11): 2021-2031.

To estimate the influence of non-medical use of prescription opioids (NMUPO) on heroin initiation among US veterans receiving medical care. Using a multivariable Cox regression model, we analyzed data from a prospective, multi-site, observational study of HIV-infected and an age/race/site-matched control group of HIV-uninfected veterans in care in the United States. Approximately annual behavioral assessments were conducted and contained self-reported measures of NMUPO and heroin use. Veterans Health Administration (VHA) infectious disease and primary care clinics in Atlanta, Baltimore, New York, Houston, Los Angeles, Pittsburgh and Washington, DC. A total of 3396 HIV-infected and uninfected patients enrolled into the Veterans Aging Cohort Study who reported no life-time NMUPO or heroin use, had no opioid use disorder

diagnoses at baseline and who were followed between 2002 and 2012. The primary outcome measure was self-reported incident heroin use and the primary exposure of interest was new-onset NMUPO. Our final model was adjusted for socio-demographics, pain interference, prior diagnoses of post-traumatic stress disorder and/or depression and self-reported other substance use. Using a multivariable Cox regression model, we found that non-medical use of prescription opioids NMUPO was associated positively and independently with heroin initiation [adjusted hazard ratio (AHR) = 5.43, 95% confidence interval (CI) = 4.01, 7.35]. New-onset non-medical use of prescription opioids (NMUPO) is a strong risk factor for heroin initiation among HIV-infected and uninfected veterans in the United States who reported no previous history of NMUPO or illicit opioid use.

### **Developmental Course Of Non-medical Use Of Prescription Drugs From Adolescence To Adulthood In The United States: National Longitudinal Data.**

McCabe, Sean Esteban; Kloska, Deborah D; Veliz, Philip; Jager, Justin; Schulenberg, John E. *Addiction*. 2016; 111(12): 2166-2176.

To identify the developmental course of non-medical use of four separate prescription drug classes (opioids, sedatives, stimulants and tranquilizers) by examining the general functional growth and related covariates during the transition from adolescence to adulthood in the United States. Nationally representative probability samples of high school seniors were followed longitudinally across five waves (waves 1, 2, 3, 4 and 5: modal ages 18, 19/20, 21/22, 23/24 and 25/26 years, respectively). Data were collected via self-administered questionnaires to high school seniors and young adults in the United States. The sample consisted of nearly 72 000 individuals in 30 cohorts (high school senior years of 1977-2006) who participated in at least one wave. Self-reports of annual non-medical use of prescription opioids, sedatives, stimulants, and tranquilizers. The annual non-medical use of prescription opioids, sedatives, stimulants and tranquilizers was highest at wave 1 over the five waves. There was a consistent descending path (linear and quadratic slopes,  $P < 0.001$ ) in annual non-medical use from baseline across all four prescription drug classes (e.g. opioids linear slope = -0.043 and opioids quadratic slope = 0.034,  $P < 0.001$ ). While the annual non-medical use of stimulants declined over time (linear slope = 0.063,  $P < 0.01$ ; quadratic slope = -0.133,  $P < 0.001$ ), the same decrease was not observed for the annual non-medical use of prescription opioids, sedatives or tranquilizers when controlling for socio-demographic and substance use behaviors at baseline. The covariates associated with the general functional growth differed across the four prescription drug classes. The non-medical use of prescription opioids, sedatives, stimulants and tranquilizers appears to peak during late adolescence, suggesting preventive intervention efforts should be initiated in early adolescence. The developmental course of non-medical use is not the same among all four classes of prescription drugs, suggesting that each drug class warrants individual research.

### **E-cigarette use as a predictor of cigarette smoking: results from a 1-year follow-up of a national sample of 12th grade students.**

Miech R, Patrick ME, O'Malley PM, Johnston LD. *Tob Control*. 2017 Feb 6. [Epub ahead of print]

**OBJECTIVE:** To prospectively examine vaping as a predictor of future cigarette smoking among youth with and without previous cigarette smoking experience. A secondary aim is to investigate whether vaping may desensitize youth to the dangers of smoking. **METHODS:** Analysis of prospective longitudinal panel data from the nationally representative Monitoring the Future study. The analysis is based on 347 12th grade students who were part of a randomly selected subsample that completed in-school surveys in 2014 and were resurveyed 1-year later.

**RESULTS:** Among youth who had never smoked a cigarette by 12th grade, baseline, recent vapers were more than 4 times (relative risk (RR)=4.78) more likely to report past-year cigarette smoking at follow-up, even among youth who reported the highest possible level of perceived

risk for cigarette smoking at baseline. Among 12th grade students who had smoked in the past but had not recently smoked at baseline, recent vapers were twice (RR=2.15) as likely to report smoking in the past 12 months at the follow-up. Vaping did not predict cessation of smoking among recent smokers at baseline. Among never-smokers at baseline, recent vapers were more than 4 times (RR=4.73) more likely to move away from the perception of cigarettes as posing a 'great risk' of harm, a finding consistent with a desensitization process. CONCLUSIONS: These results contribute to the growing body of evidence supporting vaping as a one-way bridge to cigarette smoking among youth. Vaping as a risk factor for future smoking is a strong, scientifically-based rationale for restricting youth access to e-cigarettes.

### **Do College Students Improve Their Grades By Using Prescription Stimulants Nonmedically?**

Arria, Amelia M; Caldeira, Kimberly M; Vincent, Kathryn B; O'Grady, Kevin E; Cimini, M Dolores; Geisner, Irene M; Fossos-Wong, Nicole; Kilmer, Jason R; Larimer, Mary E. *Addict Behav.* 2017; 65(): 245-249.

Many college students engage in nonmedical use of prescription stimulants (NPS) because they believe it provides academic benefits, but studies are lacking to support or refute this belief. Using a longitudinal design, 898 undergraduates who did not have an ADHD diagnosis were studied. Year 3 GPA (from college records) of four groups was compared: Abstainers (did not engage in NPS either year; 68.8%); Initiators (NPS in Year 3 but not Year 2; 8.7%); Desisters (NPS in Year 2 but not Year 3; 5.8%); and Persisters (NPS in both years; 16.7%). Generalized estimating equations regression was used to estimate the association between NPS and change in GPA, controlling for sex and Year 2 GPA. GPA increased significantly within Abstainers ( $p < 0.05$ ), but did not change significantly within the other groups. Overall, the relationship between NPS pattern group and change in GPA was not statistically significant ( $p = 0.081$ ). NPS was generally infrequent, but Persisters used more frequently than Desisters (11.7 versus 3.4 days in Year 2) and Initiators (13.6 versus 4.0 days in Year 3, both  $p < 0.001$ ), controlling for sex and Year 2 GPA. We cannot rule out the possibility that NPS prevented declines in GPA, but we can conclude that students who engaged in NPS showed no increases in their GPAs and gained no detectable advantages over their peers. The results suggest that prevention and intervention strategies should emphasize that the promise of academic benefits from NPS is likely illusory.