INTEGRATING SOCIAL AND EMOTIONAL CONTEXTS IN PREDICTING ADOLESCENT AND YOUNG ADULT SMOKING PATTERNS

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Overview of Talk

- Overview of problem of adolescent and young adult smoking
- Integrative program project study using multi-method approach to understanding patterns of adolescent smoking
- Trajectories of adolescent smoking into young adulthood
- Proximal contexts: role of momentary mood and emotional responses to smoking
- Emergence of dependence
- Family Context
- Changing tobacco landscape and implications
Targeting Tobacco Use: The Nation’s Leading Cause of Death

- 43.8 million adults in the US smoke cigarettes
- Approximately 443,000 deaths yearly from cigarettes
  - Half of all users will die or have significant disability directly related to their tobacco use
- Cigarette smoking is responsible for one in every five deaths
- Enormous economic burden of tobacco use
  - More than $96 billion in medical costs attributed to smoking
- Harmful effects of smoking extend beyond smoker to the smoker’s family
  - Prenatal exposure
  - Secondhand smoke exposure in homes
Since 2005, smoking rates have stalled at ~20%.
19% in 2011.

2020 Healthy People objective is 12% smoking prevalence.

Adults who were current cigarette smokers, National Health Interview Surveys, 1965-2009.
The Challenge...

- In order to reduce significantly the toll from tobacco use, we need both to
  - decrease initiation and
  - increase cessation among users, including adolescents and young adults.

- The vast majority of smokers start smoking during adolescence.

- Early use is associated with greater dependence and greater difficulty quitting.
  - Adolescence and young adulthood remain key points of intervention.
Adolescents and Young Adults are Prime Targets for Intervention

- Greater health gains are achieved the earlier one stops smoking
- Smokers are more likely to succeed at quitting at lower levels of dependence and exposure
- Interrupting the progression from initial trials of smoking to dependence is critical.
Adolescence: A Time of Vulnerability and Opportunity

- Risk taking in adolescence may be normative
  - Biological basis
  - Neurocognitive basis

- Adolescents’ decision making is in flux

- Behaviors may be seen as a “phase” when identities are tried and put on and off

- Smoking still maintains an allure
Smoking serves multiple and complex functions for youth.
Youth start to smoke to improve their image, to achieve social belonging, and in response to perceived peer pressure.
Many youth describe themes of cigarettes providing “security” to those who feel insecure socially.
Youth continue to smoke because of the physiological/drug effects of nicotine, mood management, and because they feel addicted.
What percent of high school seniors in 2012 do you think have ever tried cigarette smoking?

1. 30%
2. 40%
3. 50%
4. 60%
Trends in Prevalence of Ever Smoking for 8th, 10th, and 12th Graders (MTF)

Data from monitoringthefuture.org
Trends in 30-Day Prevalence of Cigarette Smoking for 8th, 10th, and 12th Graders (MTF)

Data from monitoringthefuture.org
Trends in Prevalence of Daily Cigarette Smoking for 8th, 10th, and 12th Graders (MTF)

Data from monitoringthefuture.org
What age range is at greatest risk for cigarette smoking escalation?

1. 13-15 years of age
2. 16-17 years of age
3. **18-21 years of age**
4. 22-30 years of age
Young Adulthood: A Time of Transition

- 18-24 – “emerging adulthood” (EA) as distinct
- Demographic, sociocultural and labor market changes have made the 18-24 year old group more transitional than in the past
- Distinctive traits and functions to EA period
  - Time to make decisions about course of one’s life (marriage, careers, children)
  - Experimentation with different roles and possible selves
  - Highly fluid and changeable time
  - Special risks and opportunities
    - Increasing executive functions and autonomy
    - Reaching legal age for many events
    - Leaving home
    - Entering workforce or higher education
    - Stable relationships
    - Risk behaviors peak during EA
    - Increased tobacco industry marketing to this age group
Prevalence of Smoking in Young Adults (18-24 years old)

- NHIS Data 2010 – current smoking as 100+ cigarettes in lifetime and currently smoking “every day or some days”

- Overall prevalence of 18.9% in 2011 among 18-24 year olds – greatest declining trend
  - 24.4% in 2005 to 18.9% in 2011

- Rates vary by gender, education, and race
Adolescent Experimentation with Smoking

- Many adolescents try cigarette smoking
  - 2012 MTF data show lifetime use among 12th graders = 39.5%

- But not all progress to regular smoking
  - 9.3% of 12th graders (MTF, 2012) report daily smoking
  - 4.0% of 12 graders (MTF, 2012) report smoking half a pack + per day

- Relatively little is known about factors that predict different trajectories of use beyond experimentation or how dependence develops — much speculation about the role of affect and social context
Smoking and Adolescents: A dynamic interplay of distal and proximal processes

**Distal Influences**
- Age 18 &
- Future Orientation
- Role Transitions
- Culture
- Family
- Genetics

**Proximal Influences**
- Immediate context: peers; substance use
- Momentary Mood
- Cues

**Developmental Issues**
- Decision making
- Background Affect; comorbidities
- Media

Immediate context:
Adolescents and Smoking: What We Need to Know

- Why do some youth who experiment with smoking progress to dependence, whereas others do not?
- In order to develop interventions that interrupt the progression from experimentation to dependence, we need to know more about the patterns and processes involved.
Social and Emotional Contexts of Adolescent Smoking Patterns

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“Piece by Piece: Making Health Connections”
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Overall Goals of Program Project

- Examine the intersection of social, emotional, and biological/genetic domains to address the overarching question:
  - How do adolescents’ and young adults’ social, emotional, and genetic contexts contribute to the divergent pathways of smoking and influence the likelihood that some youth who experiment with smoking will progress to regular use and dependence in young adulthood?
Overview of Program Project

- In-depth, multi-method, multi-level study of patterns and predictors of smoking from initial trials onward that emerge during adolescence and into young adulthood

- Methods
  - Self-report questionnaires
  - In-depth qualitative interviews
  - Ecological momentary assessments
  - Psychophysiological laboratory assessments
  - Family observation
  - Genetic analysis
  - Cutting-edge statistical approaches to complex data
A Unique Cohort of Adolescents

- All projects draw from a shared cohort of adolescents (N = 1263) with planned overlap in methods of assessments.
- Cohort accrued from youth in 9th and 10th grade and will be followed through age 24.
  - Screened 12,970 adolescents from 16 high schools.
- Oversampled for ever smoking.
  - 83% ever smoked.
    - Compared to 28% base rate.
  - 45% smoked in past 30 days at baseline.
    - Compared to < 10% base rate.
Baseline Demographics (N = 1263)

- **Grade**
  - 50.7% 9th, 49.3% 10th

- **Mean Age**
  - 15.6 years (13.9 – 17.5)

- **Gender**
  - 43.5% Male ; 56.5% Female

- **Ethnicity/Race**
  - Hispanic N = 217 (17.2%)
  - Asian/Pac Isl N = 50 (4.0%)
  - Black N = 214 (16.9%)
  - White N = 713 (56.5%)
  - Other/Unknown N = 69 (5.5%)

- 41.7% Have at least one smoker in household
Trajectories of Adolescent Smoking from Trying Onward
One smoking pattern over 2 years.....
Estimated Individual Trends

Estimated individual Trends

Period (90 day periods)
Trajectory Analyses

- Growth mixture models (Mplus) used to identify the form and number of latent trajectory classes based on smoking rate data (cigs/day) over time from baseline through 5 year follow-up.

- Among 1263 participants, 244 did not smoke at all over all time points (19%) – form a priori group of nonsmokers.
  - 1019 participants included in Growth Mixture Model (Mplus6) – identify form and number of latent class trajectories.

- Allowed for nonlinear trends across time by incorporating both linear and quadratic trends and further allowed the subject’s intercept to be a random effect.

- 5 class model chosen based on fit (BIC) and substantially meaningful trajectories.
Differences Among Trajectory Groups

- Higher trajectory groups significantly more likely to be:
  - Male
  - White
  - Have lower educational attainment
  - Biological parents who smoke
Summary of Trajectory Groups

- Along a variety of smoking-related dimensions, the escalating trajectory classes showed both higher levels and escalating slopes over time.
- Classes differed significantly from each other on all dimensions and in an ordered fashion.
Transitioning to Young Adulthood
Changes Between 24 and 33-Months

- At 24 months, the overwhelming majority of participants were still in either 11th or 12th grade.
- At 33 months, 73% were age 18 or older.
- At 33 months, 54% had completed high school.
- Goal: examine how smoking behavior at 33 months varied by trajectory group – were there discontinuities based on age or high school graduation?
Increases in Past Month Smoking by Trajectory Group at Transition Points

- Nonsmokers through 24 months
  - 8.6% became smokers at 33 months
    - Compared to transition rate of 2.5% between 15 and 24 months

- Lowest, most infrequent smokers – only rare trying
  - Prevalence of past month smoking increased from 19% to 35% between 24 and 33 months

- Individuals with nonescalating, very infrequent smoking showed discontinuities in frequency of smoking at the transition points
Emergence of Dependence
True or False: Adolescents can show symptoms of nicotine dependence after smoking only a few cigarettes.

1. True
2. False
Nicotine Dependence May Follow Different Developmental Trajectories

- Growing longitudinal evidence from multiple groups examining symptoms of nicotine dependence (O’Loughlin et al., Hu, Kandel, et al., DiFranza et al.) suggests that nicotine dependence may have different developmental trajectories.
- Symptoms of ND may emerge for some adolescents at very low levels of exposure and sporadic smoking.
- Some symptoms may be more predictive of later dependence.
  - Patterning of symptoms may be important.
Early Emerging Nicotine Dependence Symptoms (Dierker & Mermelstein, 2010)

- Do nicotine dependence symptoms predict smoking 2 years later?
- Compared light smokers and more regular smokers
  - N = 594 adolescents whose lifetime smoking < 100 cigarettes
  - N = 152 adolescents with lifetime smoking > 100 cigarettes
- Examined symptom endorsement of 10 items NDSS at baseline to predict smoking at 24 months (past week and daily smoking)
  - Coded as any level of endorsement of symptom (0,1)
  - Controlled for smoking frequency
Predictive Validity of Symptoms by Initial Level of Smoking

- For adolescents who had smoked < 100 cigs baseline:
  - Higher levels of nicotine dependence significantly predicted both past week smoking (OR = 2.4, CI = 1.39-4.03) and daily smoking at 24 months (OR = 2.2, CI = 1.11-4.45) – after controlling for baseline smoking, sex, other tobacco use.

- For adolescents who had smoked > 100 cigs baseline:
  - Only significant predictor of future smoking was baseline smoking frequency.
Predictive Symptoms for Low Level Smokers

- Whenever I go without a smoke for a few hours, I experience craving
- If there were no cigarettes in the house and there was a big rainstorm, I would still go out of the house and find a cigarette
- In situations where I need to go outside to smoke, it’s worth it to be able to smoke a cigarette, even in cold or rainy weather
- After not smoking for awhile, I need to smoke to relieve feelings of restlessness and irritability
- After not smoking for awhile, I need to smoke to keep myself from experiencing any discomfort
- I can function much better in the morning after I’ve had a cigarette
Importance of Assessing Early Symptoms of Nicotine Dependence

- For low level adolescent smokers whose lifetime smoking < 100 cigarettes, individual symptoms of craving, withdrawal, and perceived functioning predicted past week or daily smoking two years later

- Individual differences in nicotine dependence may drive lower levels of use
Proximal Contexts of Smoking: Role of Momentary Mood and Emotional Responses to Smoking
Theoretical, empirical, and anecdotal reports suggest that cigarette smoking is reinforcing
- Relief of negative affect
- Much evidence among adults, and some among adolescents

Importantly, mood effects of smoking may be an important factor in understanding escalation and the development of dependence.
Ecological Momentary Assessments (EMA)

- EMA samples behavior in the context in which it occurs -- thus possessing a high degree of ecological validity.
- EMA reduces retrospective bias.
- EMA is well-suited for measuring subjective states, intra-individual variability, and small shifts in mood.
- EMA, through the use of random prompts, provides unbiased data about the antecedents of events as well as useful comparison information about non-target events.
- Ideal for studying the contextual patterns of smoking as well as subjective experience.
ED Interviews

- 7-day monitoring period each wave

- 4 Types of Interviews
  - Random prompt — initiated by the device; on average 5 times/day
  - Smoke event — subject initiated immediately after smoking (even a puff)
  - “Decide not to smoke” event — subject initiated; when has the opportunity to smoke, but makes decision to decline to smoke
  - “Can not smoke” event — subject initiated; no opportunity; want to smoke
Primary Variables Assessed on ED: Random Prompt

- Mood
- Activity
- Location
- Food/Dietary
- Companionship
  - With others and who
  - Social tone of situations (e.g., support, conflict, sense of belonging)
  - Presence of other smokers
Smoke and No Smoke Interviews

- All random prompt items
- Additional mood items (before event)
  - Withdrawal items
- Additional items about smoking specific topics (e.g., amount smoked, inhalation, access to cigarettes, etc.)
Electronic Diary

Right Now
I feel Happy

Very Much
Somewhat
Not at All

back   go

Electronic Diary
Smoke    NoSmoke
Suspend  Problem Report
Bedtime  Demo
OOPS!

back   go

3/19/13
Adolescents, Affect, and Smoking: Some Questions of Interest

- What prompts adolescents to smoke “in the moment?”
  - Does smoking occur at times when adolescents feel subjectively different than random times?

- What are the immediate affective consequences of smoking?
  - Do adolescents feel better after smoking – reduced negative affect or increased positive affect?

- Understanding the longitudinal links between situational affect and smoking may help to inform better our understanding of the development of dependence in adolescents.
Analyses of Mood Effects

- Mixed effects models examining mood pre and post smoking compared to random events
  - Analytic sample: 247 with smoke reports with 2623 smoking event reports (report here on 5 year follow-up)
  - Include gender and interaction effects with gender
  - Include both between subject and within subject effects
    - Subjects vary in proportion of smoking events
    - Subjects vary from their own average
  - Include proportion of smoking events
  - Random intercept, random event (smoke, random)
Positive Affect and Smoking

Random mood vs Pre Smoke Mood – no gender interaction

Random Mood vs Post Smoke Mood by Gender

Significant within subject effects; no significant between subject effects for pre smoke; Post smoke – significant between and within; significant interaction for gender and within subject effect
No effects for gender; Significant effects both pre and post comparisons for within subject effects
Change in Mood with Smoking

Estimated change in mood; no significant gender differences; significant change for both positive and negative
Do baseline changes in mood following smoking predict escalation?
Subjective Mood Responses and Trajectory Group

- **Positive Affect Changes**
  - Lowest level of nonescalating triers did not show a significant boost in positive affect at baseline
  - Two escalating classes showed significant and substantial boosts in positive affect at baseline, \( p < .0001 \)

- **Negative Affect Changes**
  - Escalating smokers showed a consistent and significant reduction in negative affect at baseline
Conclusions About Affective Antecedents and Consequences of Smoking

- Mood states just prior to smoking are overall, subjectively worse than background, random times.
- Following smoking, there are significant and notable improvements in mood.
- Increasing suggestion that escalation and maintenance of smoking among even low using adolescents may be driven by mood factors.
Family Talk About Smoking

An Observational Study

Laurie Wakschlag, Ph.D., Lead Investigator
How parents and teens talk about smoking may be helpful in understanding different pathways from initial trials of smoking onward.

What does it “look like” when parents talk to their teens about smoking?
Observational Paradigm

- Home-based video-recorded dyadic interactions
- 3 types of discussion segments, each 10 minutes
  - Family Life
  - Disagreement
  - Smoking Discussion
- Semi-structured with use of flip cards
- Global coding scheme, not micro, focusing on affective and qualitative aspects (frequency and intensity) of discussion
The Smoking Discussion Paradigm

| Smoking conversation “triggers” (Wakschlag, et al 2006) |
|---------------------------------|---------------------------------|
| **Teen**                        | **Parent**                     |
| “Let’s talk about how people in our family feel about cigarette smoking” | “Let’s talk about my experiences with cigarettes and smoking” |
| “How do today’s teens make decisions about cigarette smoking?” | “Let’s talk about what parents do if they find out that their teenager smoked cigarettes” |
|                                 | “Let’s talk about what parents do if their teenager becomes a regular smoker” |
Smoking Discussion Observational Codes

- All behaviors coded on a 9-point scale with the goal of assessing gestalt of behavior across 10 minute segment

- **Level of Disapproval**
  - Stated disapproval, intensity of belief system, affective valence, persuasiveness, and consistency of disapproval

- **Quality of Personal Disclosure**
  - Quality, quantity, and complexity of personal disclosure about personal experiences with smoking

- **Smoking Expectancy**
  - Degree to which teens and parents believe adolescent will attempt smoking in future

- **Establishment and Elaboration of Consequences (parent only)**
  - Clarity in communicating specific, realistic, and firm consequences for breaking household smoking rules or engaging in smoking
Participants in Family Talk

- 348 teens
  - All of whom had ever tried smoking
- Both mothers and fathers participated
- Parent smoking status
  - Never smoked (12%)
  - Experimenters (39%)
  - Ex-Smokers (26%)
  - Current Smokers (23%)
Parents’ Observed Communications About Smoking by Parent Smoking Status

Parent Smoking Status:
- Never/Experiment
- Former
- Current

Observation Ratings:
- Mom Disapproval
- Dad Disapproval
- Mom Elaboration/Rules
- Dad Elaboration/Rules

Graph showing the relationship between parent smoking status and observation ratings of disapproval and elaboration/rules.
Examined transient versus persistent smoking among teens from baseline to 6 months later

- **Transient smokers (N = 241):**
  - Mean number days smoked in past 30
    - Baseline = 0.60
    - 6 Months = 0.40

- **Persistent smokers (N = 84):**
  - Mean number of days smoked in past 30
    - Baseline = 3.76
    - 6 Months = 12.91
Observed Behaviors Show Incremental Validity

- In model with teen sex, teen age, parent smoking status, and teen and parent self-report of messages and reactions, significant predictive effects found for:
  - Teen Expectancies about smoking: OR = 1.21 (1.03-1.42)
  - Mom’s disclosure: OR = 1.24 (.99-1.56)
  - Teen Disapproval: OR = 0.79 (.63-.99)
  - Teen Disclosure to Dad: OR = 1.44 (1.12-1.85)
Wrap-Up

- Even low levels of intermittent smoking is a problem in adolescents.
- Age 18 and post-high school transitions are especially vulnerable points for escalation.
- Early emerging symptoms of dependence in light, infrequent smokers signal a propensity for escalation.
- Dependence may also be driven by cognitive expectancies for negative affect relief.
- Mood changes with smoking are robust, even with low level adolescent smokers, persist over time, and predict escalation.
- Parent-adolescent quality, richness, and content of smoking-related dialogues are important in understanding escalation beyond initial trials.
Intervention Implications

- Intervene early in the upswing process
  - Lack of interventions for “experimenters”
- Age 18 and post high school are opportunities for intervention
- Consider a complex array of ways to manage momentary mood crises and feelings of stress, anger, loneliness
  - Adolescent smokers are looking for quick relief of negative affect
- Remember parents
Changing Tobacco Landscape: Emerging New Products and FDA Authority
Do you think the FDA should have the authority to ban flavorings (like mint, fruit, herb, or licorice) in all tobacco products to help keep kids from smoking?

1. Yes
2. No
Family Smoking Prevention and Tobacco Control Act

- Enacted 2009
- Key Substantive Elements:
  - Requires the industry to provide information to the government that allows government to better inform consumers
  - Restricts marketing that appeals to kids, misleads adults, deceptively encourages tobacco use
  - Strengthens restrictions on sales to youth
  - More accurately informs consumers
    - Improved warning labels
    - More accurate testing of tar, nicotine, harmful substances
    - Standards to prohibit unsubstantiated health claims
  - Regulation of the contents of the product to protect consumers
  - Post Market Surveillance
What are Newer Tobacco Products?

- Noncombustible Forms of Tobacco
  - Snus
  - Electronic cigarettes
  - Dissolvable products – lozenges, orbs, strips, sticks

- Alternative non-cigarette, combustible products
  - Little cigars
  - Hookah
Product Facts:
- Each disc contains approximately 1.5 mg of nicotine.
- Sixteen blue mint flavored discs per package.
- Retail stores are contractually required to sell VERVE discs only to adults of legal age to purchase tobacco products in a clerk-assisted transaction and merchandise the product in a non-self-service manner.
- Sold in child resistant packaging stating “Keep Out of the Reach of Children.”
- Manufactured in Richmond, Va.
WHY QUIT?
SWITCH TO BLU

blu is the smart choice for smokers wanting a change. Take back your freedom to smoke when and where you want without ash or smell. Blu is everything you enjoy about smoking and nothing else. Nobody likes a quitter, so make the switch today.

Visit blucigs.com

* New blu Smart Pack

PREMIUM ELECTRONIC CIGARETTE

18+ only. | CALIFORNIA PROPOSITION 05 - Warning: This product contains nicotine, a chemical known to the state of California to cause birth defects or other reproductive harm.
Rise from the Ashes

You smoke. So did we. Freedom and flavor never go out of style and neither do you. Tell the world you’ve moved up, smoke when and where you want.

blucigs.com

blu ELECTRONIC CIGARETTE

18+ ID required. blu e-cigs are not a smoking cessation product and have not been evaluated by the Food and Drug Administration, nor are they intended to treat, prevent or cure any disease or condition.
SMOKE IN STYLE
With blu Electronic Cigarettes

Freedom never goes out of fashion. Control when and where you want to smoke with blu electronic cigarettes. blu produces no tobacco smoke and no ash, only vapor, making it the ultimate accessory and the smarter alternative to regular cigarettes. Step out in style with blu.

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* Introducing the World’s First Smart Pack (Online Only)

blu ecigs are not a smoking cessation product and have not been evaluated by the Food and Drug Administration, nor are they intended to treat, prevent or cure any disease or condition.

18+ ID required.
NJOY’s offering provides an alternative

**Public Safety Risks**
- Odorless
- Non-Flammable
- No Ash

**Inconvenient**
- Allowed in venues where traditional cigarettes are not (bars, restaurants, sporting arenas, etc)

**Health Repercussions**
- No tar
- Won’t discolor teeth

**High Price Point**
- Cheaper than traditional cigarettes
- Average savings: 50%
Final Point...Surveillance

- Looking back
  - The history of “lights”
- Looking forward
  - The potential for exposure reduction claims with unknown population level behavioral effects on current users and non-users
  - The evolving marketplace
- There is a critical need for aggressive and well-funded marketplace and behavioral surveillance
- Appeal to youth?
THANK YOU!