Psychosocial Mechanisms of Smoking Abstinence among Smokers of Low Socioeconomic Status

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Overview

- State of tobacco use and disparities among low socioeconomic status (SES) smokers
- Explanatory model of drug use and health behavior
- Recent work testing aspects of this model among:
  - Peripartum women in relapse prevention counseling
  - Low SES smokers in cessation counseling
- Summaries and Implications
State of Tobacco Use and Disparities

• 2010 adult smoking prevalence rate, 19.3% (CDC, 2012)

• Profound disparities in prevalence by race, gender, and especially SES.
  – “[SES] is commonly conceptualized as the social standing or class of an individual or group. It is often measured as a combination of education, income and occupation.” (APA, 2013)
State of Tobacco Use and Disparities

- Smoking prevalence rates by SES indicators, 2009

<table>
<thead>
<tr>
<th>Education</th>
<th>Women</th>
<th>Men</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>GED</td>
<td>44.8</td>
<td>53.2</td>
<td>49.1</td>
</tr>
<tr>
<td>Diploma</td>
<td>21.5</td>
<td>29.0</td>
<td>25.1</td>
</tr>
<tr>
<td>Some College</td>
<td>21.0</td>
<td>26.1</td>
<td>23.3</td>
</tr>
<tr>
<td>Undergraduate Degree</td>
<td>9.9</td>
<td>12.4</td>
<td>11.1</td>
</tr>
<tr>
<td>Graduate Degree</td>
<td>6.3</td>
<td>4.9</td>
<td>5.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poverty Status</th>
<th>Women</th>
<th>Men</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below</td>
<td>28.7</td>
<td>34.2</td>
<td>31.1</td>
</tr>
<tr>
<td>At or Above</td>
<td>16.7</td>
<td>22.2</td>
<td>19.4</td>
</tr>
</tbody>
</table>

State of Tobacco Use and Disparities

• Thus, smoking is becoming increasingly concentrated within lower SES groups (Gilman et al., 2003)

• Lower SES is related to:
  – Higher level of nicotine dependence (Siahpush et al., 2006)
  – Smoking bans at home and work (Shopland et al., 2006)
  – Decreased likelihood of quitting (Barbeau et al., 2004; CDC, 2012; Reid, et al, 2010)
State of Tobacco Use and Disparities

• We know very little about:

  – 1) What mediates the relationship between SES and smoking cessation?

  – 2) How do multiple mechanisms of cessation come together to affect smoking among low SES smokers?
State of Tobacco Use and Disparities

• Increased knowledge in these areas may
  – Highlight potential treatment targets within this disadvantaged population
  – Improve current smoking cessation interventions
  – Ultimately lead to increased cessation success and reduce tobacco related health disparities and disease burden in low SES groups
Witkiewitz K. & Marlatt GA. Relapse prevention for alcohol and drug problems: That was Zen, this is Tao. Am Psychol 2004:59; 224-35.
What mediates the relationship between SES and smoking cessation?

Study 1

MECHANISMS LINKING SES AND POST-PARTUM SMOKING RELAPSE

Study Overview

• Data from “Project MOM” (Reitzel, et al. 2009)
  – Randomized clinical trial evaluating a treatment for reducing postpartum smoking relapse among women who quit smoking during pregnancy
  – Recruited at 30-33 weeks
  – Quit smoking during pregnancy or within 2 months prior

• Provided relapse prevention counseling
• Baseline SES and mediators, 8 weeks postpartum abstinence status
Analyses

• Structural Equation Modeling using mean and variance adjusted weighted least squares (WLSMV)

• Four models were developed based on theoretical models and tested to determine a model that would best fit the current data.
  – SES was controlled for race/ethnicity, age, partner status, # previous births
  – Relapse status was controlled for treatment group
# Study Measures

- **Outcome:** Relapse status at 8 weeks post-partum
- **Predictors:** Four Latent Variables

<table>
<thead>
<tr>
<th>SES</th>
<th>Negative Affect</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Educational Level</td>
<td>• Positive And Negative affect Schedule, Negative Affect subscale (PANAS-NA)</td>
</tr>
<tr>
<td>• Employment Status</td>
<td>• Center for Epidemiological Studies Depression Scale (CES-D)</td>
</tr>
<tr>
<td>• Insurance Status</td>
<td>• Perceived Stress Scale (PSS)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Agency</th>
<th>Craving</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Self-efficacy/Confidence</td>
<td>Wisconsin Smoking Withdrawal Scale, Craving Subscale items:</td>
</tr>
<tr>
<td>Scale (SECS) affect/social situations</td>
<td>• Urge to smoke</td>
</tr>
<tr>
<td>• SECS negative affect situation</td>
<td>• Thoughts about smoking</td>
</tr>
<tr>
<td>• SECS habit/craving situations</td>
<td>• Desire to smoke</td>
</tr>
<tr>
<td>• Affective Information Processing Questionnaire (AIPQ)</td>
<td>• Focus on smoking cues</td>
</tr>
</tbody>
</table>
Hypothesized Models

Model 1

\[ \chi^2(43, N = 251) = 54.59, p = .11 \]
CFI = .959
TLI = .967
RMSEA = .033
WRMR = .83
BIC = 15520.94

Model 3

\[ \chi^2(45, N = 251) = 53.90, p = .17 \]
CFI = .969
TLI = .975
RMSEA = .028
WRMR = .79
BIC = 15509.92
Results: The Final Model

Model 2:
$\chi^2(45) = 53.90, p = .17; \text{CFI} = .969; \text{TLI} = .975; \text{RMSEA} = .028; \text{WRMR} = .799$
Results: The Final Model

Standardized estimate = .02; p = .03
Results: The Final Model

Standardized estimate = -.02; 
\( p = .02 \)
Study 1 Summary

- Identified negative affect, agency, and craving as mediators of SES-relapse relationship
- Craving as sole direct pathway to relapse
  - Important even long after cessation
  - Craving as important treatment target in relapse prevention
- Limitations: special population, mostly cross-sectional, not a comprehensive test of model
How do multiple mechanisms of cessation come together to affect smoking among low SES smokers?

Study 2

RECIPIROCAL RELATIONS AMONG MECHANISMS OF SMOKING CESSATION

CASTRO Y, CANO MA, MAZAS CA, BUSINELLE MS, CORREA-FERNANDEZ V, HEPPNER WL, & WETTER DW. A CROSS-LAGGED PANEL ANALYSIS OF FIVE INTRAPERSONAL DETERMINANTS OF SMOKING CESSATION. MANUSCRIPT IN PREPARATION.
Study Overview

- Data from Project CARE: a longitudinal cohort study of low SES smokers in treatment
- Received smoking cessation counseling and NRT
- Assessed on several psychosocial variables at baseline and follow-ups
- Data from 2-weeks pre-quit, quit day, and 1-week post-quit
Analyses

• Cross-lagged panel path analysis using WLSMV
• Initial fully-cross lagged model was tested for fit
• Paths systematically removed and each resulting model tested for fit
  – DIFFTEST for significant loss of fit
  – Most parsimonious model that fit the data.
Study Measures

- Motivation—Five-item measure adapted from Heppner, et al., 2010
- Self-efficacy—SECS total score
- Positive Affect—PANAS Positive Affect subscale
- Negative Affect—PANAS Negative Affect subscale
- Craving—WSWS Craving subscale
## Participant Characteristics (N = 434)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>% or M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race/ethnicity</td>
<td>32% African American/Black 30% Hispanic/Latina 32% White</td>
</tr>
<tr>
<td>Male</td>
<td>46.8%</td>
</tr>
<tr>
<td>Age</td>
<td>41.2 (11.2)</td>
</tr>
<tr>
<td>Years of Education</td>
<td>12.9 (2.0)</td>
</tr>
<tr>
<td>Married/Living with Partner</td>
<td>34.3%</td>
</tr>
<tr>
<td>Income (&lt; 20000)</td>
<td>58%</td>
</tr>
<tr>
<td>Unemployed</td>
<td>41.6%</td>
</tr>
<tr>
<td>Cigarettes per day</td>
<td>21 (10.3)</td>
</tr>
</tbody>
</table>
Hypothesized Model

Pre-quit
- Motivation
- Self-efficacy
- Positive Affect
- Negative Affect
- Craving

Quit Day
- Motivation
- Self-efficacy
- Positive Affect
- Negative Affect
- Craving

Post-quit
- Abstinence
Hypothesized Model

Pre-quit
- Motivation
- Self-efficacy
- Positive Affect
- Negative Affect
- Craving

Quit Day
- Motivation
- Self-efficacy
- Positive Affect
- Negative Affect
- Craving

Post-quit
- Abstinence
Hypothesized Model

Pre-quit

Motivation

Self-efficacy

Positive Affect

Negative Affect

Craving

Quit Day

Motivation

Self-efficacy

Positive Affect

Negative Affect

Craving

Post-quit

Abstinence
Hypothesized Model

Pre-quit

- Motivation
- Self-efficacy
- Positive Affect
- Negative Affect
- Craving

Quit Day

- Motivation
- Self-efficacy
- Positive Affect
- Negative Affect
- Craving

Post-quit

- Abstinence
Hypothesized Model

Pre-quit
- Motivation
- Self-efficacy
- Positive Affect
- Negative Affect
- Craving

Quit Day
- Motivation
- Self-efficacy
- Positive Affect
- Negative Affect
- Craving

Post-quit
- Abstinence
Hypothesized Model

Pre-quit
- Motivation
- Outcome Expectancies
- Positive Affect
- Negative Affect
- Craving

Quit Day
- Motivation
- Outcome Expectancies
- Positive Affect
- Negative Affect
- Craving

Post-quit
- Abstinence
Hypothesized Model

Pre-quit
- Motivation
- Self-efficacy
- Positive Affect
- Negative Affect
- Craving

Quit Day
- Motivation
- Self-efficacy
- Positive Affect
- Negative Affect
- Craving

Post-quit
- Abstinence
Hypothesized Model

Pre-quit
- Motivation
- Self-efficacy
- Positive Affect
- Negative Affect
- Craving

Quit Day
- Motivation
- Self-efficacy
- Positive Affect
- Negative Affect
- Craving

Post-quit
- Abstinence
Hypothesized Model

Pre-quit
- Motivation
- Self-efficacy
- Positive Affect
- Negative Affect
- Craving

Quit Day
- Motivation
- Self-efficacy
- Positive Affect
- Negative Affect
- Craving

Post-quit
- Abstinence
Hypothesized Model

Pre-quit

- Motivation
- Self-efficacy
- Positive Affect
- Negative Affect
- Craving

Quit Day

- Motivation
- Self-efficacy
- Positive Affect
- Negative Affect
- Craving

Post-quit

- Abstinence
Hypothesized Model

Pre-quit

- Motivation
- Self-efficacy
- Positive Affect
- Negative Affect
- Craving

Quit Day

- Motivation
- Self-efficacy
- Positive Affect
- Negative Affect
- Craving

Post-quit

- Abstinence
Results: Hypothesized Model

• “Good” fit of the cross-lagged model
  – \( \chi^2 \) [5] = 8.91, \( p = .11 \); RMSEA = .04, CFI = .99, TLI = .98; WRMR = .24

• 15 paths were systematically removed
  – Most parsimonious model
  – Good fit for the data
Results: Final Model

$\chi^2_{[19]} = 19.82, p = .41$; RMSEA = .01
CFI = .99
TLI = .99
WRMR = .37
Results: Final Model

Motivation (5 item scale) → Quit Day Motivation (5 item scale)

Self-efficacy (SECS) → Quit Day Self-efficacy (SECS)

Positive Affect (PANAS-PA) → Positive Affect (PANAS-PA)

Negative Affect (PANAS-NA) → Negative Affect (PANAS-NA)

Craving (WSWS-C) → Craving (WSWS-C)

One Week Post-quit

Abstinence

χ² [19] = 19.82, p = .41; RMSEA = .01
CFI = .99
TLI = .99
WRMR = .37
Results: Final Model

Pre-quit

- Motivation (5 item scale)
  - Self-efficacy (SECS)
  - Positive Affect (PANAS-PA)
  - Negative Affect (PANAS-NA)
  - Craving (WSWS-C)

Quit Day

- Motivation (5 item scale)
  - Self-efficacy (SECS)
  - Positive Affect (PANAS-PA)
  - Negative Affect (PANAS-NA)
  - Craving (WSWS-C)

One Week Post-quit

- Abstinence

**Path Coefficients:**
- Motivation → Self-efficacy: 0.15**
- Self-efficacy → Positive Affect: 0.14**
- Positive Affect → Negative Affect: 0.67**
- Negative Affect → Craving: 0.31**
- Positive Affect → Motivation: 0.18**
- Negative Affect → Motivation: 0.15**

**Statistical Significance:**
- **p < 0.01**
- *p < 0.05
- †p < 0.1

**Model Fit Statistics:**
- $\chi^2 [19] = 19.82, p = .41$
- RMSEA = .01
- CFI = .99
- TLI = .99
- WRMR = .37
Results: Final Model

Pre-quit

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- Self-efficacy (SECS)
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Quit Day

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One Week Post-quit

- Abstinence

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Quit Day

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- Self-efficacy (SECS)
- Positive Affect (PANAS-PA)
- Negative Affect (PANAS-NA)
- Craving (WSWS-C)

One Week Post-quit

- Abstinence

(χ² [19] = 19.82, p = .41; RMSEA = .01
CFI = .99
TLI = .99
WRMR = .37)
Study 2 Summary

• Motivation and SE; SE and PA; NA and Craving to have reciprocal effects
  – Affirms prominent drug treatment model
  – Novel treatment target in PA?
• Only motivation and SE directly affect cessation
  – Consistent with Motivational Interviewing
• Limitations: short time span; not a comprehensive test of model
General Summary/Conclusions

• Identified some mechanisms of SES-relapse relation
• Within Low-SES smokers, gained insight on interrelationships of those mechanisms
• Highlighted potential treatment targets among Low SES smokers
• Many novel findings in need of replication
• Future models might consider role of contextual and interpersonal factors
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