# EARLY ADOLESCENT EXPOSURE TO LOW LEVELS OF ALCOHOL ADVERTISING ASSOCIATED WITH INCREASED RISK OF ALCOHOL INITIATION

Craig S. Ross, MBA

Doctoral Candidate, Epidemiology

Boston University School of Public Health

President, Virtual Media Resources, Inc.

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Virtual Media Resources
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# Co-Authors and Collaborators

James D. Sargent, MD

David H. Jernigan, PhD

Michael B. Siegel, MD MPH

Susanne E. Tanski, MD

Janice Weinberg, ScD

Lydia A Shrier, MD MPH

Ann Aschengrau, ScD

Daniel Brooks, DSc

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# Acknowledgements

# Background

# Alcohol Initiation and Adolescent Development

- Adolescence – physical, cognitive, and behavioral transitions
  - From child to adult status
  - From parent to peer intimacy
  - From conformance to individualism
- Alcohol has become symbolic of these transitions
  - Jessor and Jessor – Problem Behavior Theory

# Early Drinking and Adolescent Health

- Early drinking is associated with increased risk of:
  - Alcohol abuse and dependence
  - Unplanned sex and pregnancy
  - Unprotected sex and sexually-transmitted infections
  - Unintentional injury
  - Use of other drugs

# Alcohol Initiation Risk Factors

- Demographic Factors
  - Age, sex, race, income
- Trait Factors
  - Sensation-seeking, deviance, affective disorders
- Social Influences
  - Parental Drinking
  - Peer Drinking
  - Media alcohol portrayals
  - Alcohol advertising

# Does advertising influence drinking?

- **YES** - According to research published by Anheuser-Busch in 1975*
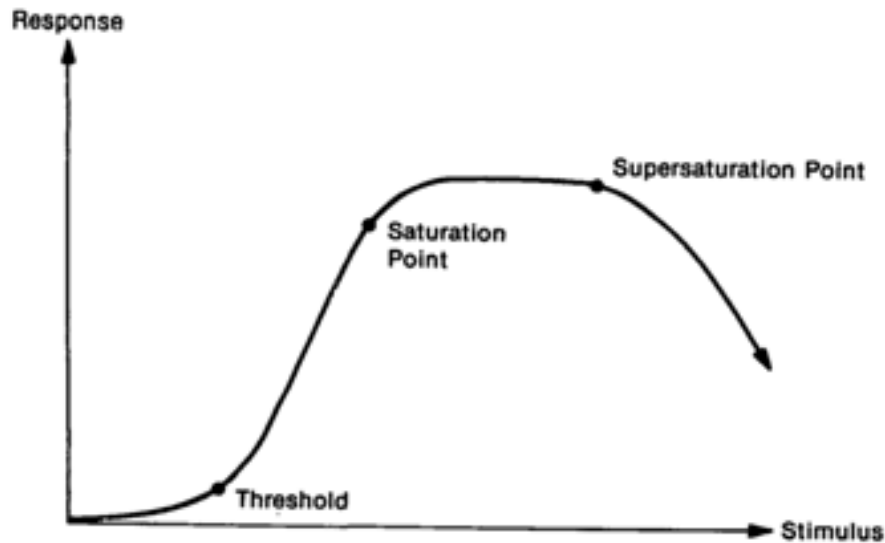


NOTE

- Non-linear response curve

- Largest effects at relatively low levels

- Saturation region where effect is small or flat

- Supersaturation region where effect is negative

*Ackoff RL, Emshoff JR. Advertising Research at Anheuser-Busch, Inc. (1963-68). *Sloan Management Review* 1975;16(2):1-15.

# Prior Research on Advertising and Alcohol Initiation

| Study | Exposure | Results |
|---|---|---|
| Robinson et. al 1998 | Hours of television viewing | AOR 1.09 (1.01-1.18) per hour |
| | | |
| Stacy et. al 2004 | Ads on popular shows | AOR Beer 1.44 (1.27-1.61) per StDev |
| | Ads on sports | AOR Beer 1.20 (1.05-1.37) per StDev |
| | | |
| Ellickson et. al 2005 | Ads on late-night shows | AOR 1.05 (no CI provided) per SqRoot unit |
| | Ads on sports | |
| | | |
| Fisher et. al 2007 | Girls discussing ads with friends | AOR 1.04 (0.84-1.29) discussed vs. not |
| | Boys discussing ads with friends | AOR 1.27 (0.98-1.64) discussed vs. not |
| | | |
| Collins et. al 2007 | Ads on popular shows | AOR 1.13 (0.95-1.34) per unit |
| | Ads on sports shows | AOR 1.19 (1.01-1.40) per unit |
| | Ads on ESPN | AOR 1.08 (0.83-1.42) per unit |

Note: All linear models and all using relatively high levels of advertising exposure
AOR = Adjusted Odds Ratio

# Research Aims for this Study

- To determine if exposure to alcohol advertising increases the risk of drinking initiation

- To address limitations in previous studies attributed to unmeasured confounders

# Methods

# Visual Media Study Sample

- US national sample of 6,522 adolescents
  - ages 10-15
  - recruited June-Oct 2003
  - random digit dialing
- Study sample 3,576 adolescents
  - Assessed at Wave 2 and Wave 3
  - Included info on favorite television
  - Included info on drinking status

# Estimating Advertising Exposure

- Three steps
  - (1) Ask participants favorite television channel
  - (2) Assess per-capita alcohol advertising exposure
  - (3 ) Convert per-capita exposure to <u>ADSTOCK</u>
    - Adstock is a point-in-time "dose" of advertising exposure

# Measures – Exposure in GRPs

- Alcohol Advertising on Favorite Channel
  - Gross Rating Points (GRPs) are per-capita exposure measures (number of ads seen / population)*100
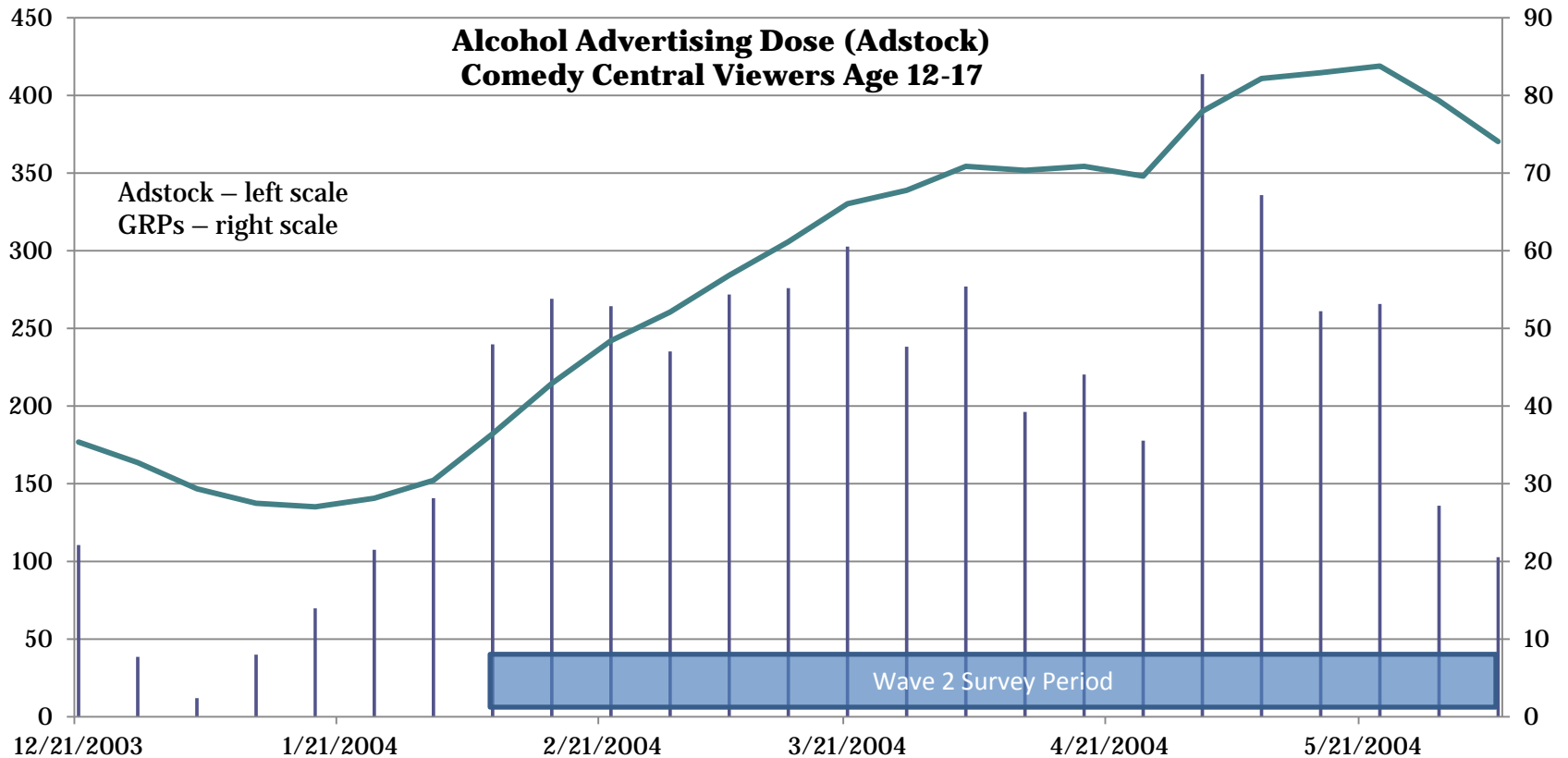
# Measures – Exposure

- ADSTOCK – Advertising "Dose"
  - Based on advertising recall
  - Advertising recall"decays" exponentially
  - Decay rate 2-3 week half-life
  - We used 3-week half-life in this analysis

# Alcohol Advertising Exposure (GRPs)



Alcohol Advertising on Comedy Central by Week

# Alcohol Advertising Dose - (Adstock 3-week half life)

# Outcome– Alcohol Initiation

- Have you ever drunk alcohol that your parents did not know about?  Yes/No
- Among 3,576 baseline non-drinkers at wave 2, 303 started drinking by wave 3 (8.5%)

# Analysis

- Estimate non-linear logistic regression models
- Find best-fitting non-linear model
  - Assessed with Akaike Information Criterion (AIC)
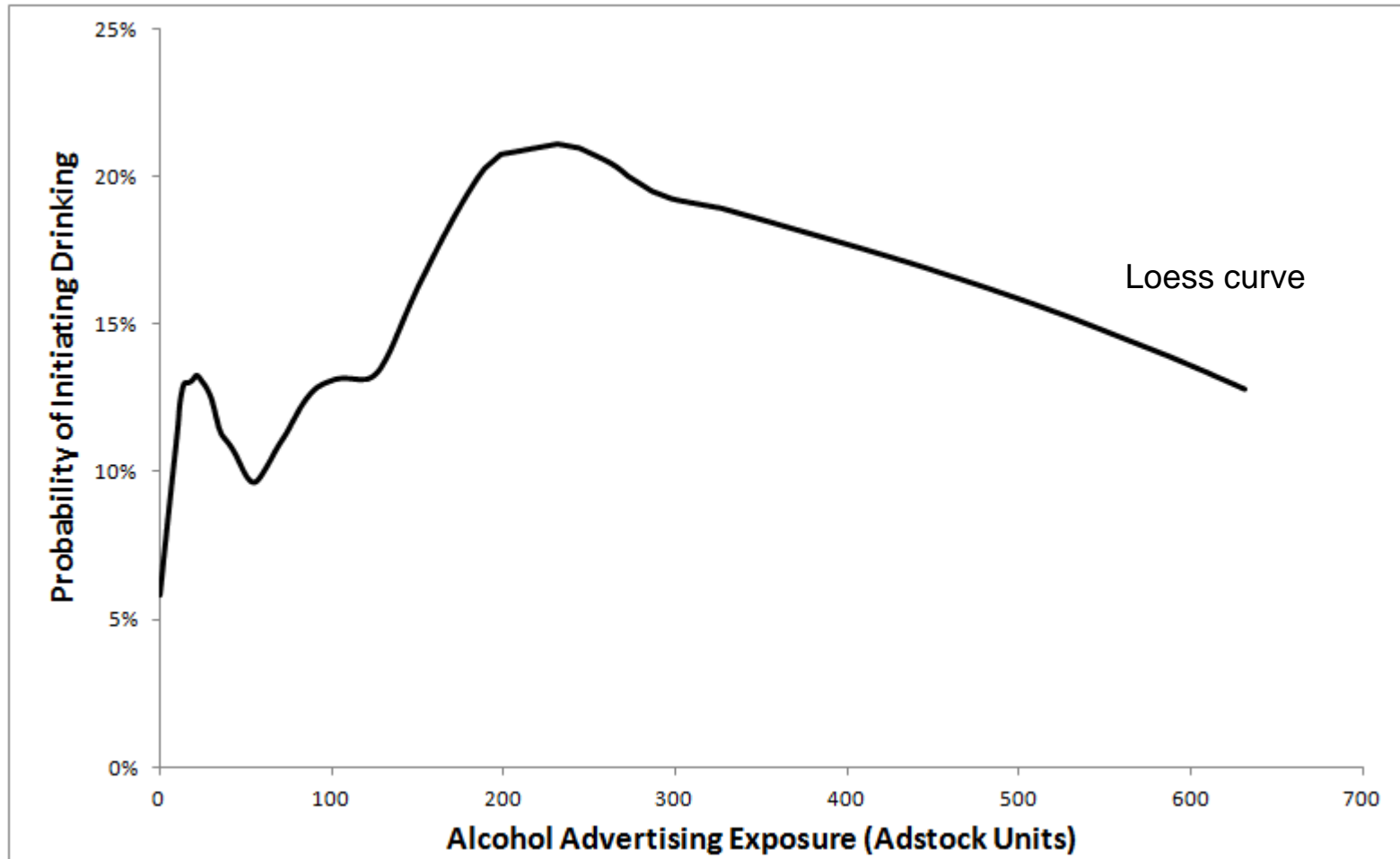
# Piecewise-Linear Models
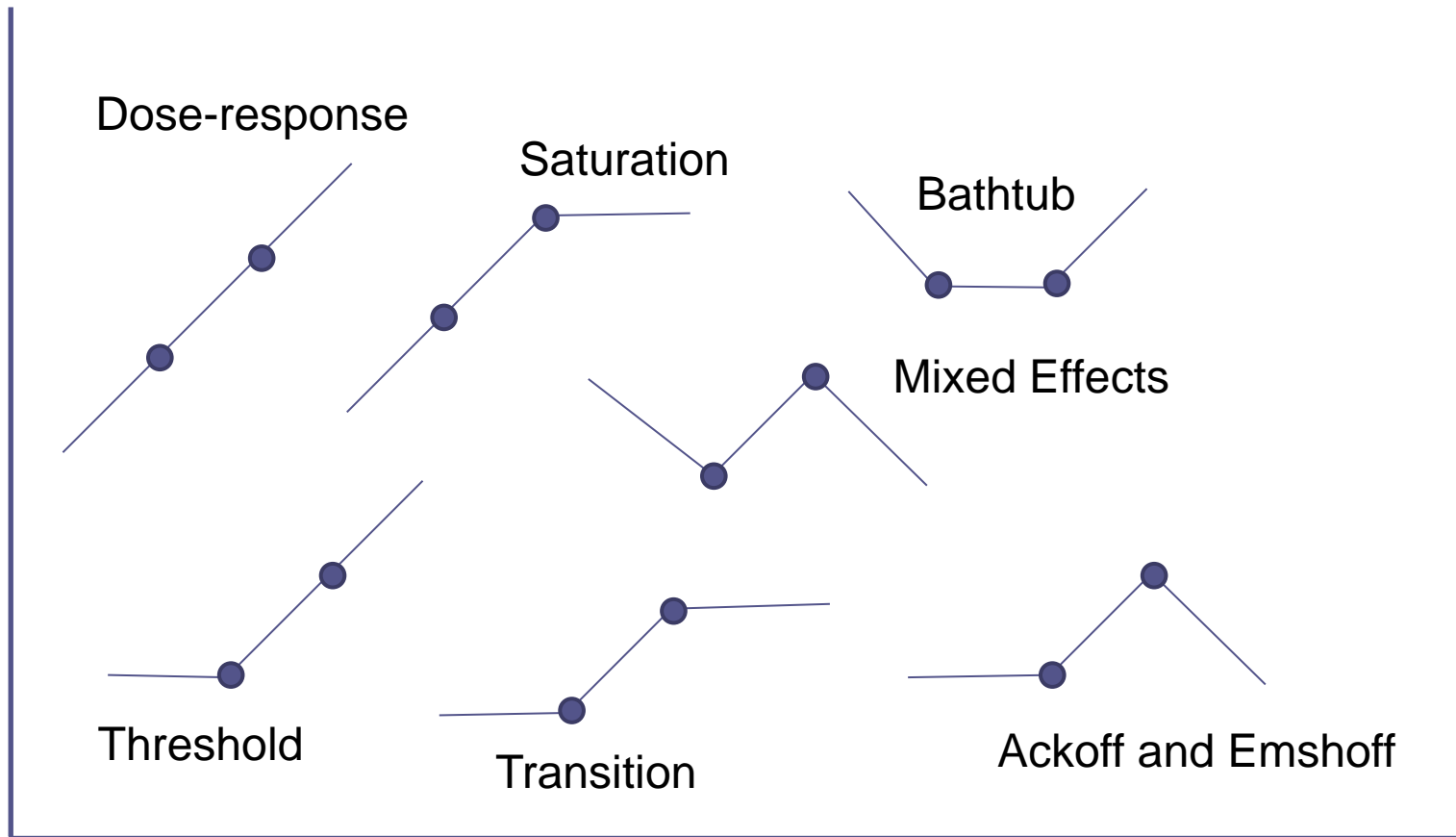
# Results

# Study Population

- 3,576 non-drinking early adolescents
- 303 initiate drinking within 12 months (8.5%)
- Mean age 12.9 (range 11-16)
- 49% Female
- Race/Ethnicity
  - Non-Hispanic White 67%
  - African-American/Black 9%
  - Hispanic 16%
  - Other 8%

# Distribution of Favorite TV Channels

| Channel | Started Drinking | N | Risk % | Mean Adstock |
|---|---|---|---|---|
| Disney | 34 | 701 | 4.9% | 0.0 |
| Nickelodeon | 16 | 472 | 3.4% | 0.0 |
| Cartoon Network | 21 | 410 | 5.1% | 0.0 |
| FOX | 33 | 276 | 12.0% | 10.9 |
| WB | 19 | 208 | 9.1% | 0.0 |
| ABC Family | 10 | 154 | 6.5% | 0.0 |
| ESPN | 21 | 143 | 14.7% | 521.8 |
| Comedy Central | 25 | 103 | 24.3% | 258.9 |
| BET | 24 | 94 | 25.5% | 22.2 |
| ABC | 5 | 83 | 6.0% | 16.3 |
| UPN | 7 | 69 | 10.1% | 0.5 |
| NBC | 7 | 47 | 14.9% | 25.4 |
| TNT | 5 | 42 | 11.9% | 99.7 |
| CBS | 4 | 40 | 10.0% | 14.9 |
| Animal Planet | 0 | 36 | 0.0% | 2.6 |
| The History Channel | 4 | 34 | 11.8% | 24.3 |
| Discovery | 3 | 31 | 9.7% | 46.3 |

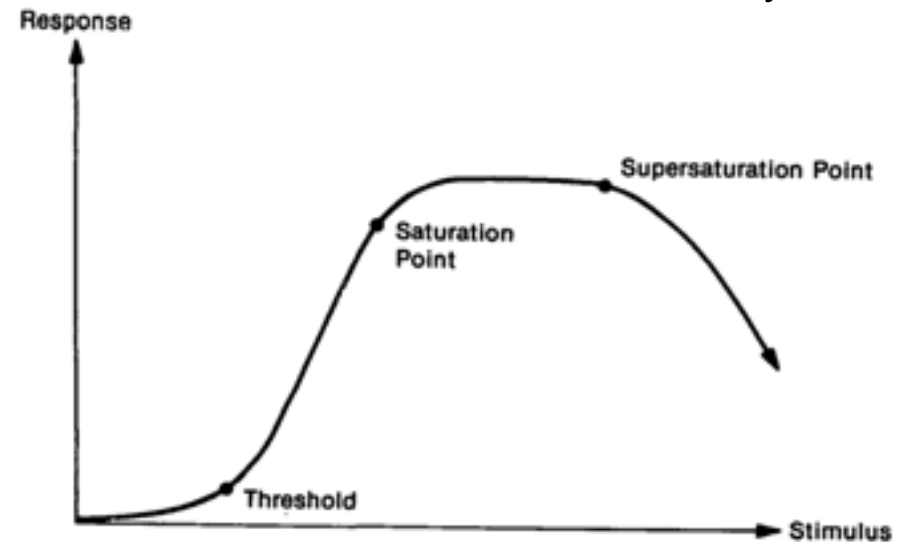# Unadjusted Assn – Exposure (Adstock) vs. Initiation
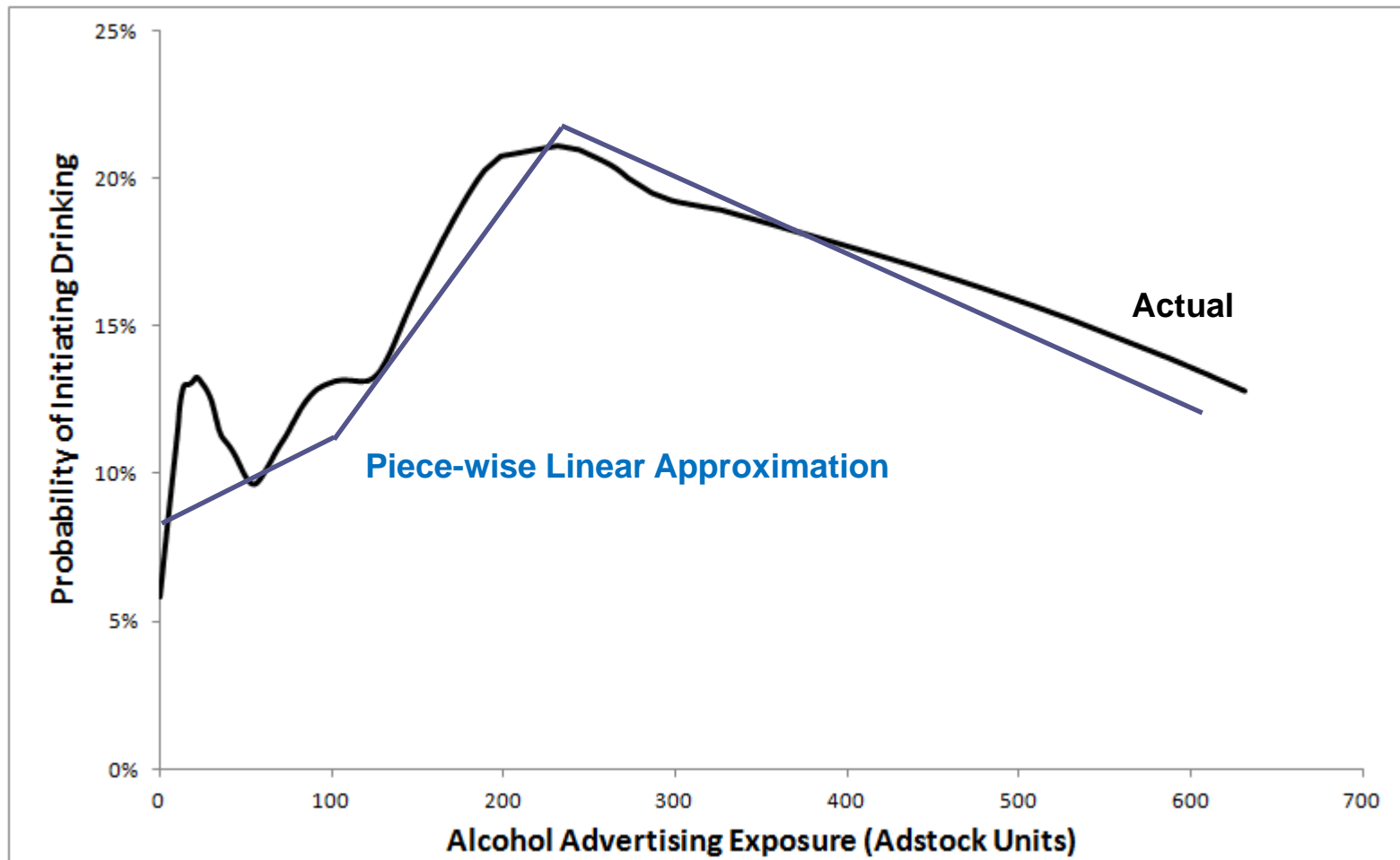
# Current Study vs. A-B Study
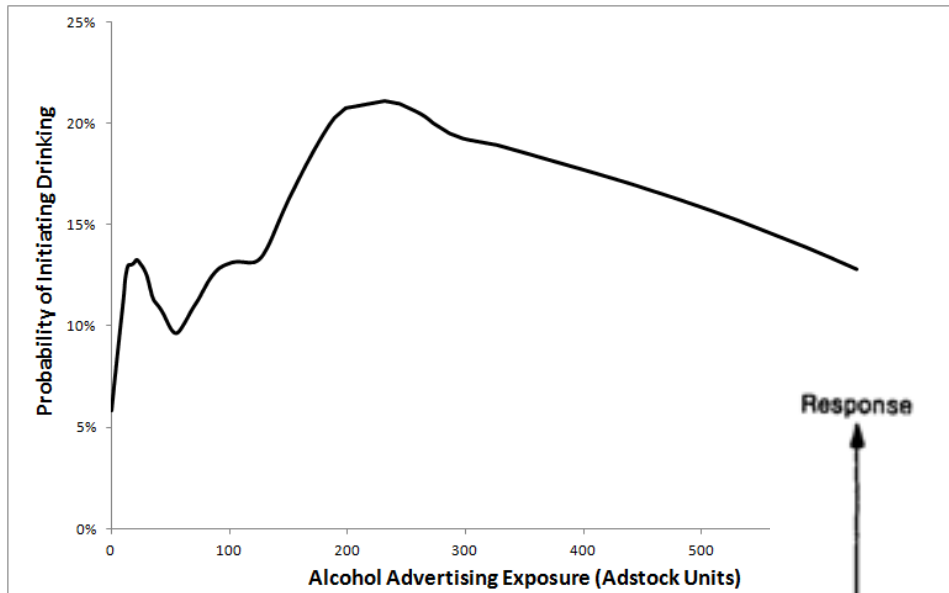


Current Study

Anheuser-Busch Study*

*Ackoff RL, Emshoff JR. Advertising Research at Anheuser-Busch, Inc. (1963-68). *Sloan Management Review* 1975;16(2):1-15.

# Piecewise-Linear Approximation

# Adjusted Linear Models

| | | Odds Ratio over Range (95% Confidence Interval) | | |
|---|---|---|---|---|
| A. Simple Linear Exp | Adstock Units† | Unadjusted | Adjusted* | |
| All Participants | 294 | 1.8 (1.4,2.3) | 1.3 (0.9,1.7) | |
| Male Participants | 294 | 1.8 (1.4,2.3) | 1.3 (1.0,1.7) | |
| Female Participants | 36 | 1.3 (1.1,1.7) | 1.0 (0.8,1.4) | |

*Adjusted for sex, race, age, parent drinking, peer drinking, school grades, parental control, religiosity, presence of older siblings, family composition, hh income, extra-curricular activities, sensation-seeking, rebelliousness, alcohol movie exposure, and TV viewing time

- Linear association is small and comparable to previously published research

- Over 294 adstock units, odds increase by 30%

- Association is statistically significant for males only

# Adjusted Non-Linear Models

| C. Piecewise-Linear Exposure - Adjusted* | Adstock Units† | Odds Ratio over Range (95% Confidence Interval) | | |
|---|---|---|---|---|
| | | Segment 1 | Segment 2 | Segment 3 |
| All Participants | 14 / 294 / 294 | 1.7 (1.0,2.8) | 2.9 (1.5,5.6) | 1.2 (0.9,1.7) |
| Male Participants | 14 / 294 / 294 | 2.1 (1.1,4.2) | 3.4 (1.7,6.9) | 1.3 (0.9,1.8) |
| Female Participants | 29 / 36 / 36 | 1.5 (0.8,3.1) | 1.8 (1.0,3.3) | 0.9 (0.6,1.3) |

*Adjusted for sex, race, age, parent drinking, peer drinking, school grades, parental control, religiosity, presence of older siblings, family composition, hh income, extra-curricular activities, sensation-seeking, rebelliousness, alcohol movie exposure, and TV viewing time

- Non-linear association is shaped like a "transition" curve

- Odds of initiation increase by 190% from 14 to 294 adstock units

- Odds of initiation for males even higher (240%)

- Effect is marginally not significant for girls but occurrs at lower levels of exposure

# Sensitivity Analyses

- Varying lengths for Adstock Half-Life
- Advertising on channels watched in combination with favorite channel
- Adjusting for depressive symptoms with simulated covariate
- Estimating impact of unmeasured/unknown confounder
- Matched results to Collins et. al 2007 for ESPN

# Discussion

# Summary of Findings

- Exposure to alcohol advertising increases the risk of drinking initiation
- Stronger effects at lower volumes of exposure
- These findings were consistent across multiple specifications of advertising exposure:
  - Adstocks calculated from "favorite" channel
  - Number of ads across multiple channels
    - Typically watched in combination with "favorite" channel

# Summary of Findings

- In maximum ranges, advertising effects are comparable to peer effects as a risk factor for drinking initiation
- Specification of a "favorite" channel alone appears to be sufficient to estimate the risk of alcohol initiation

# Limitations

- Use of "Favorite" television channel
- Potential for outcome misclassification
- Potential for dependent errors

# Conclusions

- Exposure to alcohol advertising, at relatively low volumes, increases the risk of initiation
- Effects are non-linear
  - Risk has greatest increase at lowest levels of exposure
  - At higher levels change is risk is small or negative

# Questions?

Craig S. Ross, MBA
President
Virtual Media Resources, Inc.
17 South Avenue
Suite 5
Natick, MA 01760
craig@vmr.com
US Tel 508 655 2545

Doctoral Candidate
Epidemiology
Boston University School of Public Health
csross17@bu.edu