



Identifying Threshold of Social Influences on Lifetime Smoking Status among Adolescents – A Recursive Partitioning Approach

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Social Influences and Cigarette Smoking

- Adolescents' cigarette smoking behavior is affected by the ones of their friends and parent
 - peer influences are believed to be the most significant psychosocial risk factors for cigarette smoking
 - parental behavior may have different degree of influence on child at different ages

Avenevoli & Merikangas, 2003; Kobus, 2003; Hoffman et al., 2006; Darling & Cumsille, 2003

- Combined effects of peer and parental influences
 - Non-smoking parents had a buffering effects on peer influences

Li, Pentz, & Chou, 2002

- However, the threshold of such effects have not yet been well examined
 - i.e., how many smoker friends one “needs” to have to be considered as a substantial risk factor
- Combinations of peer and parental influences with different thresholds?
 - May be useful to identify high-risk groups

Current Study

- To identify combinations and thresholds of social influences variables that predict lifetime smoking status among adolescents

Participants

- 1,073 students from the Midwestern Prevention Project
 - a longitudinal study that followed participants yearly from 6th/7th to 12th grade
- Students were from Indianapolis, IN
 - 48.7% male, 76.0% Caucasian
 - 33.6% from low socioeconomic status family
 - 74.8% from public schools
 - 48.6% in the intervention group

Social Influence Variables

- Peer influences
 - perceived friend use (1-7)
 - “How many of your close friends use cigarettes?”
 - perceived social norms (1-10)
 - “Out of every 100 students in your age, how many do you think smoke cigarettes at least once a month?”
- Parental influences
 - perceived parent use (0-2)
 - “How many of the two important adults in your life use cigarettes”

- Responses from 6th/7th to 8th grade were averaged to represent social influence during middle/junior high school (JHS) period
- Responses from 9th to 12th grade were averaged to represent high school (HS) period

Lifetime Smoking Status

- Students were considered as “lifetime non-smokers” if
 - selected “none” or “one puff to one cigarette” to the question
 - “How many cigarettes have you smoked in your whole life?”
 - at each wave of the surveys
- At 12th grade, 29.7% of the students were identified as “lifetime non-smokers”

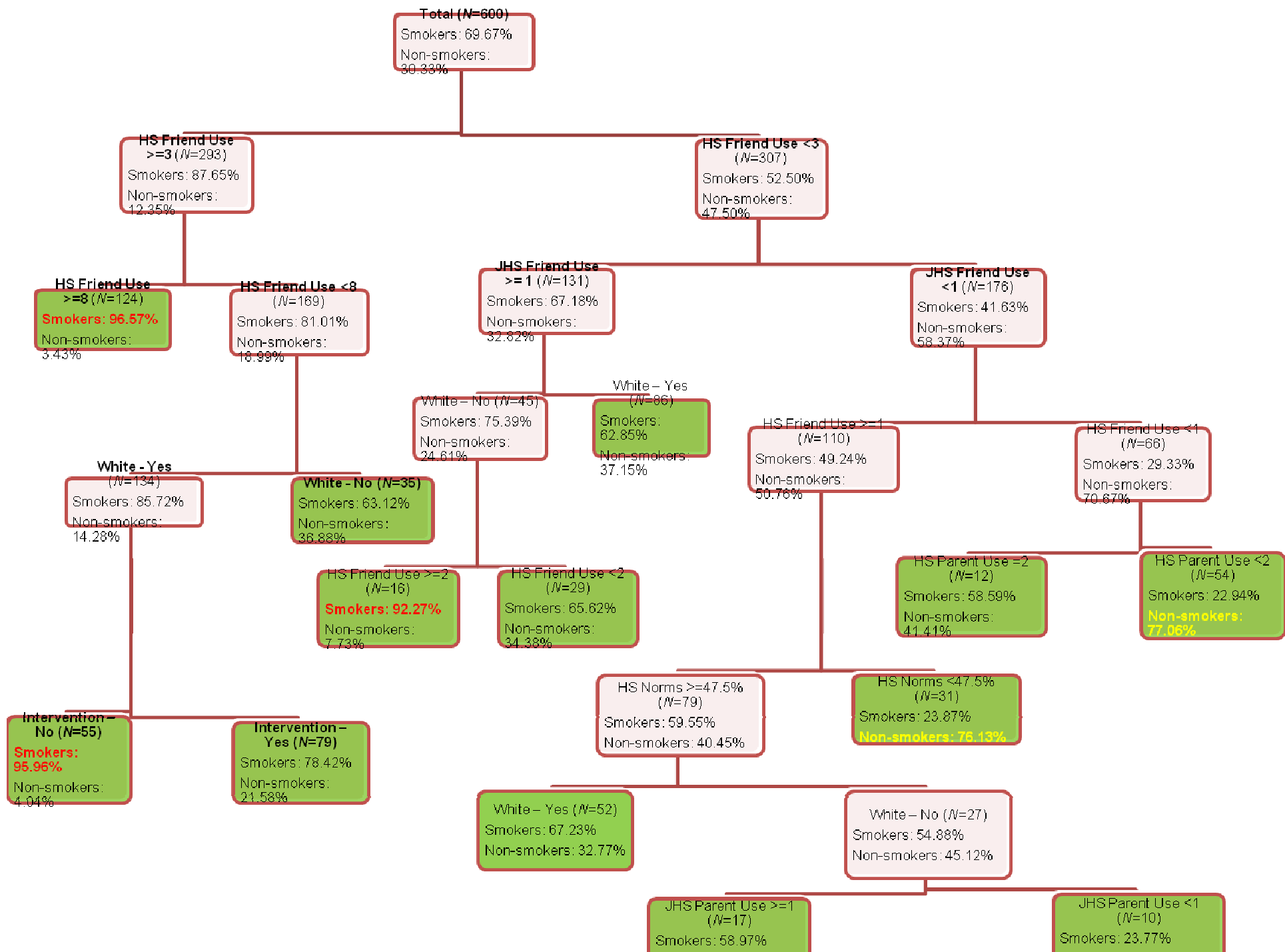
Statistical Methods

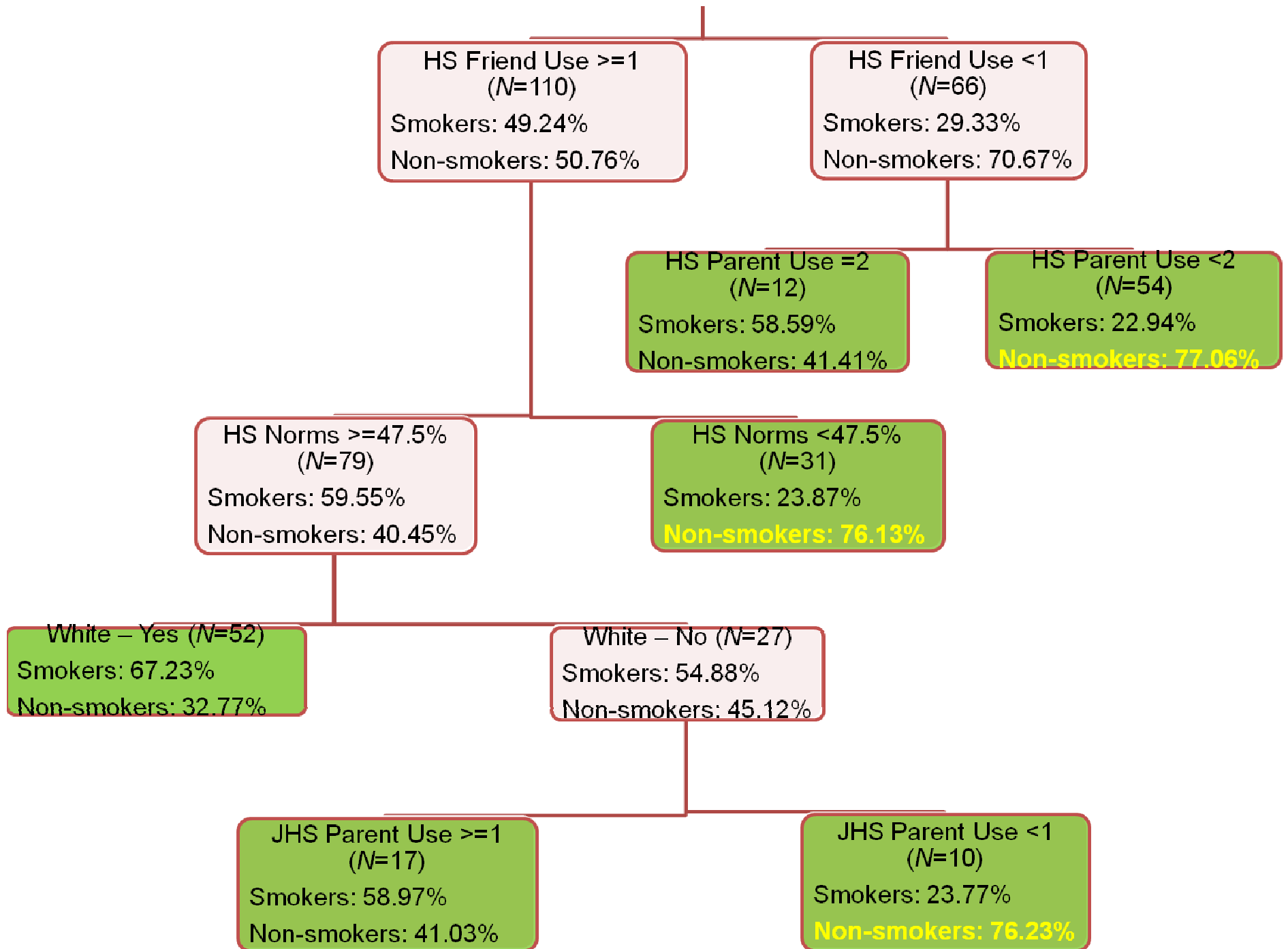
- Recursive partitioning was used to classify membership (lifetime smokers vs. non-smokers) based on social influences & demographic variables
 - a binary classification method that creates a decision tree
 - can examine the effects of combination of multiple predictors
 - if a person has x , y , and z , what is the probability of having condition q

- Combination of the predictors and the associated cut-point was selected based on conditional probability that can minimize the entropy (randomness) in the model
- Analysis was performed using JMP 9.0.0

Results

- 13 groups with different combinations of social influences and demographic variables that distinguish between lifetime smokers vs. non-smokers were identified
- Accuracy rate of predicting smokers vs. non-smokers was 76.5%





Combinations of factors that predict lifetime smokers		Probability
1. Have ≥ 8 smoker friends during HS	(N=124)	96.57%
2. Have 3-7 smoker friends during HS + White + No intervention	(N=55)	95.96%
3. Have 2 smoker friends during HS + ≥ 1 smoker friends during JHS + Non-White	(N=16)	92.27%
Combinations of factors that predict lifetime non-smokers		
1. Have no smoker friends during JHS + no smoker friends during HS + < 2 smoker parent	(N=54)	77.06%
2. Have no smoker friends during JHS + ≥ 1 smoker friends during HS + norms during HS $\geq 47.5\%$ + Non-White + no smoker parent	(N=10)	76.23%
3. Have no smoker friends during JHS + ≥ 1 smoker friends during HS + norms during HS $< 47.5\%$	(N=31)	76.13%

Conclusions

- Threshold of peer influences
 - having 2+ smoker friends during HS gives high probability of being smokers
 - having no smoker friends during JHS gives high probability of being non-smokers
- Threshold of parental influences
 - having 1 or less smoker parent gives high probability of being non-smokers

Limitations

- Self-reported measures
- Reduced variations of social influences factors by using averages across waves
- Use of only perceived friend use, social norms, and parent use to represent social influences

Implications

- Interventions start at junior high school to prevent students becoming cigarette smokers
 - counteract the social influences from peers and parents
- Interventions target high-risk group
 - high school students who have 2+ smoker friends

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