

# The student and school neighbourhood characteristics associated with smoking susceptibility among secondary school students (grades 9 to 12) in Canada

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# Outline

- ▶ Background
- ▶ Study question and rationale
- ▶ Literature review
- ▶ Methods
- ▶ Results and implications
- ▶ Strengths and limitations

# Background

Tobacco kills >6 million people each year.\*

Tobacco is still the leading cause of preventable morbidity and death in Canada.

- 37,000 deaths each year
- 2 school bus loads (100 deaths) each day

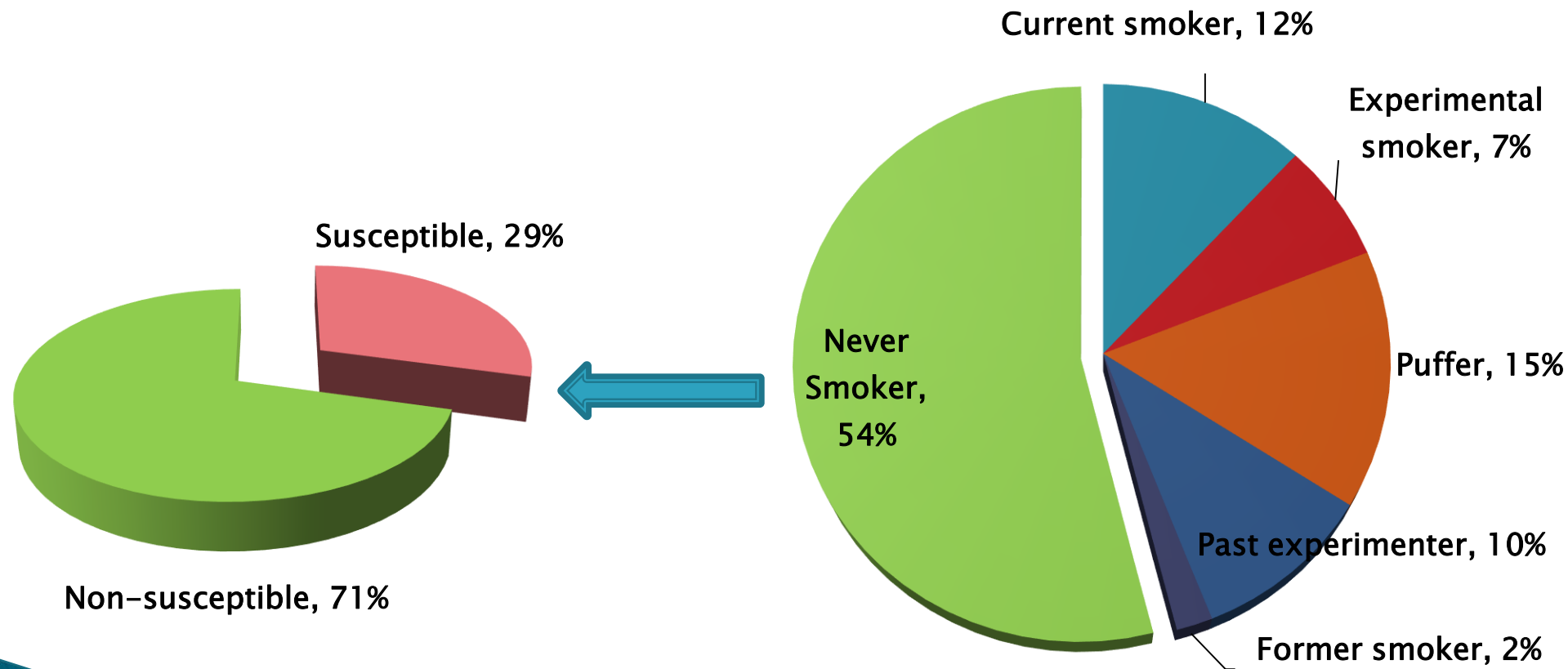
Problem: Teens hooked before understanding consequences

- ▶ In New Brunswick: Among grade 12 students who had tried smoking, smoked first whole cigarette by 14 years.

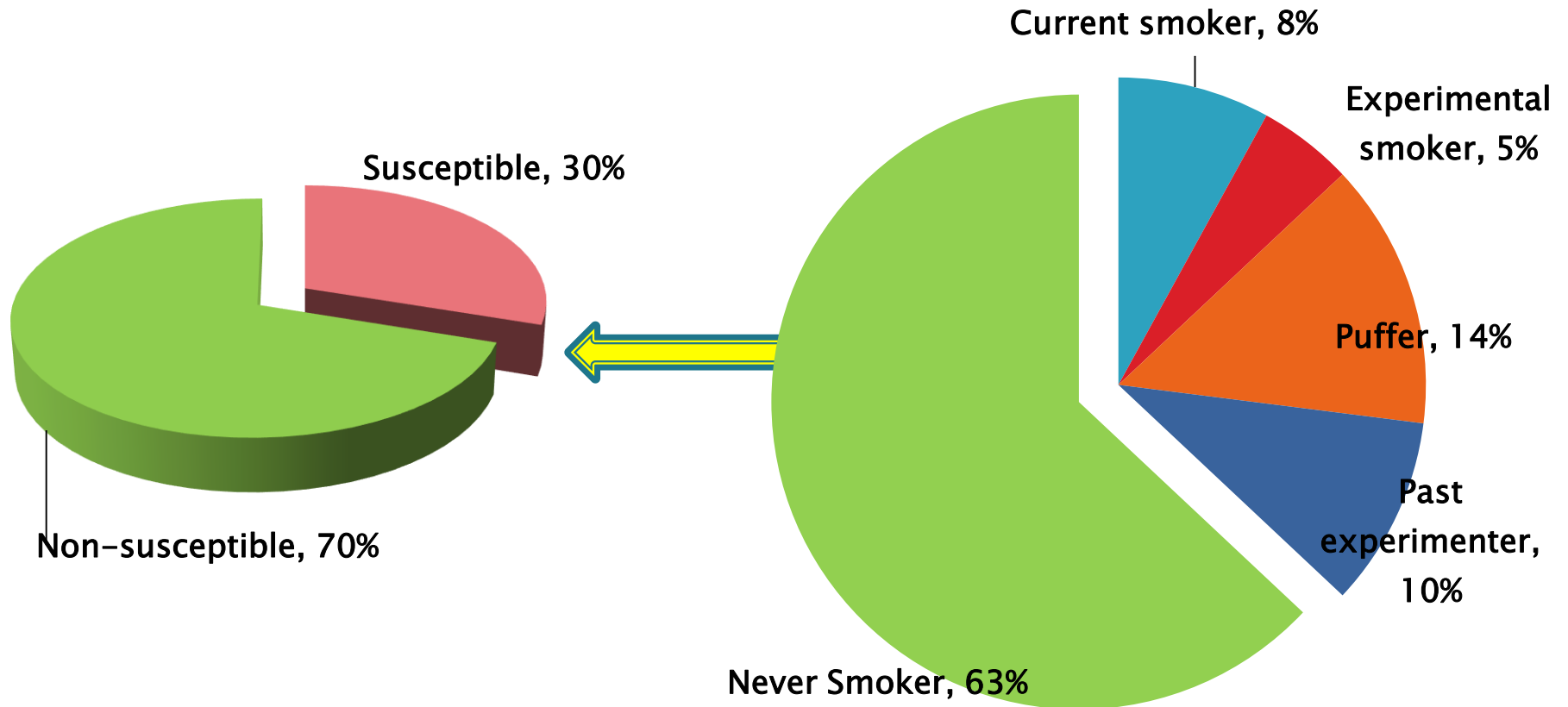
\*WHO, 2014



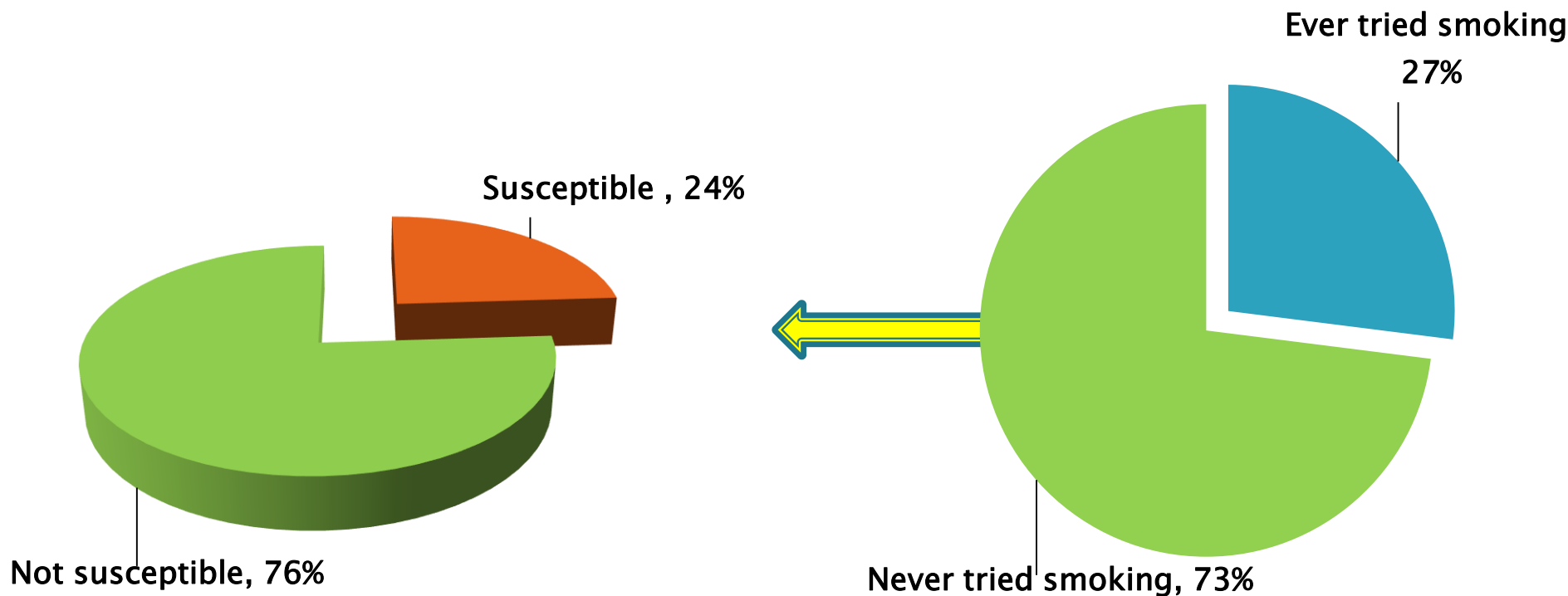
# Prevalence of Canadian adolescent tobacco use (2008/09 YSS/CSTADS)



# Prevalence of Canadian adolescent tobacco use (2012/13 YSS/CSTADS)



# Smoking prevalence among youth from New Brunswick (NBSWS 2012/13)



# Why should we be concerned about adolescents?

- ▶ Research shows that 88% of established regular adult smokers initiated smoking during their teenage years (by age 18).
- ▶ Tobacco industry exploits the teen “identity crisis” stage by sponsoring attractive advertisements (“cool”, “sporty”, “risky”).



# Why smoking stages?

- ▶ Adolescent smoking behaviour consists of distinct smoking stages.
- ▶ Can categorize teens into 3–6 smoking stages\*:
  - Being a non-smoker (not susceptible)
  - Non-smoker (susceptible)
  - Trying smoking
  - Experimenter
  - Becoming a regular & established smoker



- ▶ Public health priority to prevent smoking initiation and disrupt progression beyond initial use.

\*Mayhew et al. (2000)  
Chassin et al. (2009)



# Study Objective

- ▶ To examine which **school** and **student**-level characteristics differentiate susceptible never smokers from non-susceptible never smokers among a nationally representative sample of Canadian students in grades 9–12.

# Rationale

- ▶ Smoking susceptibility has been found to be a strong predictor of experimental smoking.\*
- ▶ Understanding the factors that differentiate a susceptible never smoker from a non-susceptible never smoker is **critical in shaping future tobacco control programs that will dissuade students who are never smokers from initiating smoking.**

\*Pierce et al, 1996;  
Wilkinson et al, 2008

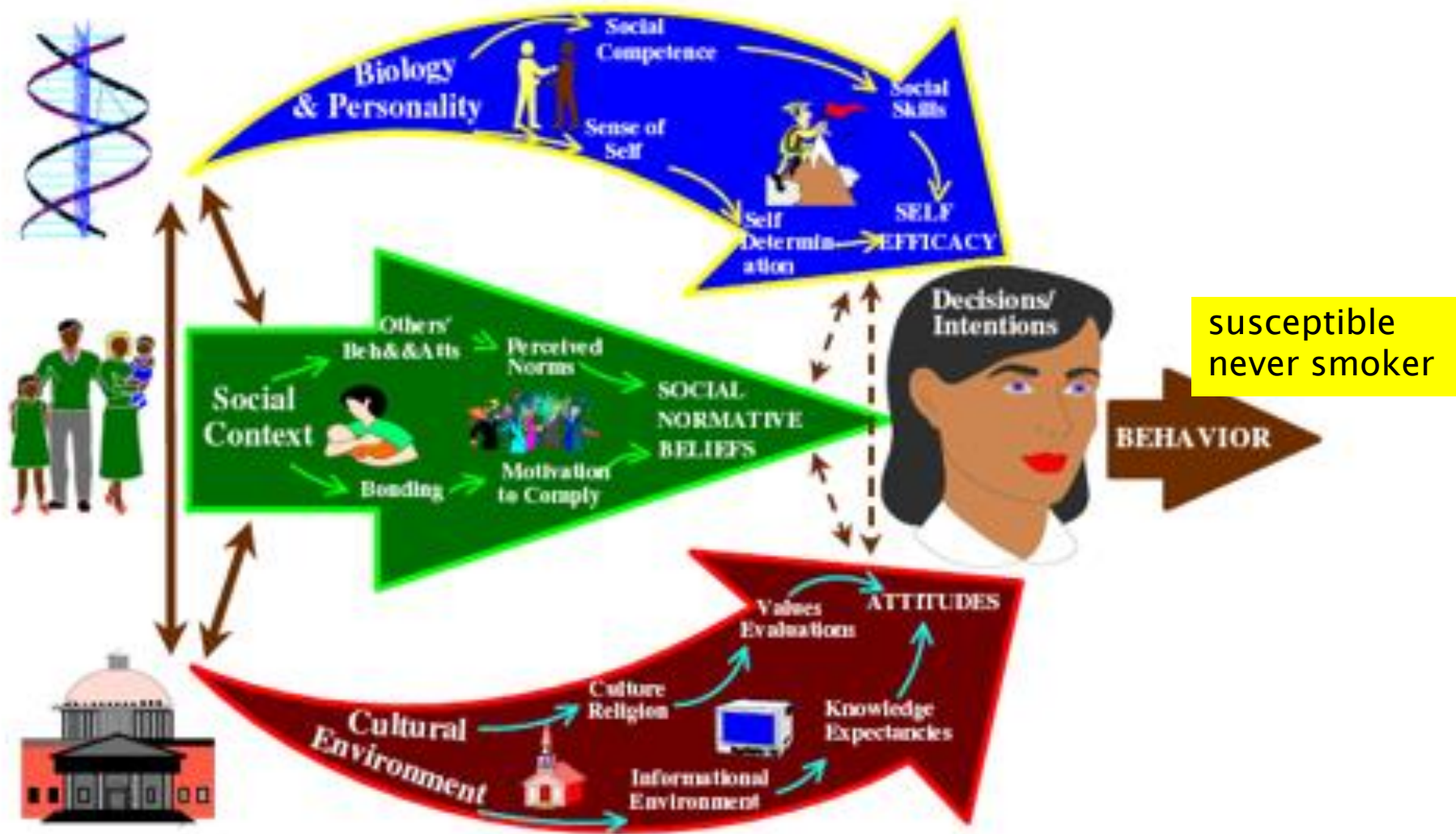
# Why concerned about youth who are susceptible to smoking?

- ▶ Susceptible youth are more vulnerable to personal, social and environmental influences that encourage them to experiment with tobacco.
- ▶ They are also vulnerable to tobacco marketing strategies and pro-smoking messages\* compared to youth who are not susceptible to smoking.

\*Unger et al, 1998

# LITERATURE REVIEW

# THE BASICS OF THE THEORY OF TRIADIC INFLUENCE\*



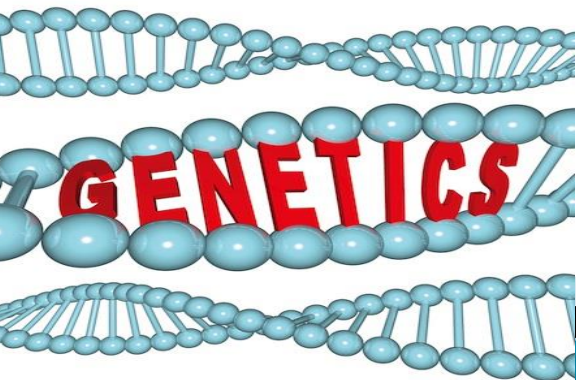
\*Flay & Petraitis, 1994; Flay et al, 1999

# Factors related to smoking susceptibility

## Intrapersonal / Student factors

- Being younger,
- Lower grade,
- Positive attitudes towards smoking,
- Consuming alcohol/drugs
- Low self-esteem

Basic personality and biological make up



## Social Context

Friends/family who smoke  
No smoking bans at home



Family/Friends



## School-level factors

- Density of tobacco retailers
- Student smoking in periphery of school
- School with her prevalence of tobacco use

Neighbourhood



# Gaps in knowledge on susceptibility

What is the influence of:

- ▶ School location (rural versus urban)?
- ▶ Socioeconomic status (SES) of the neighbourhood surrounding a school?
- ▶ Density of tobacco retailers surrounding a school?

# METHODS



# Sample

- ▶ 29,296 Canadian secondary youth (Grade 9–12) from the 2008/2009 Youth Smoking Survey (YSS/CSTADS) data. 133 Secondary schools.
- ▶ YSS/CSTADS is a machine-readable, pencil and paper nationally representative school-based survey used to measure the determinants of youth smoking behaviour.



# YSS/CSTADS procedures

- ▶ Parental consent was required for student participation.
- ▶ Administered during 1 class period.
- ▶ Survey tools took 30–40 minutes.
- ▶ Ensure confidentiality–no names, envelopes sealed and put in larger classroom envelope.

# Linked data files

- ▶ 2008/09 YSS/CSTADS data set.
- ▶ 2006 Census data set.
  - Rural/Urban location.
  - SES status of the neighbourhood in which schools were located.
- ▶ 2008/09 Desktop Mapping Technologies (DMTI) Enhanced Points of Interest (EPOI) data file.
  - Tobacco retailers within a 1-km radius of each school.

# MEASURES

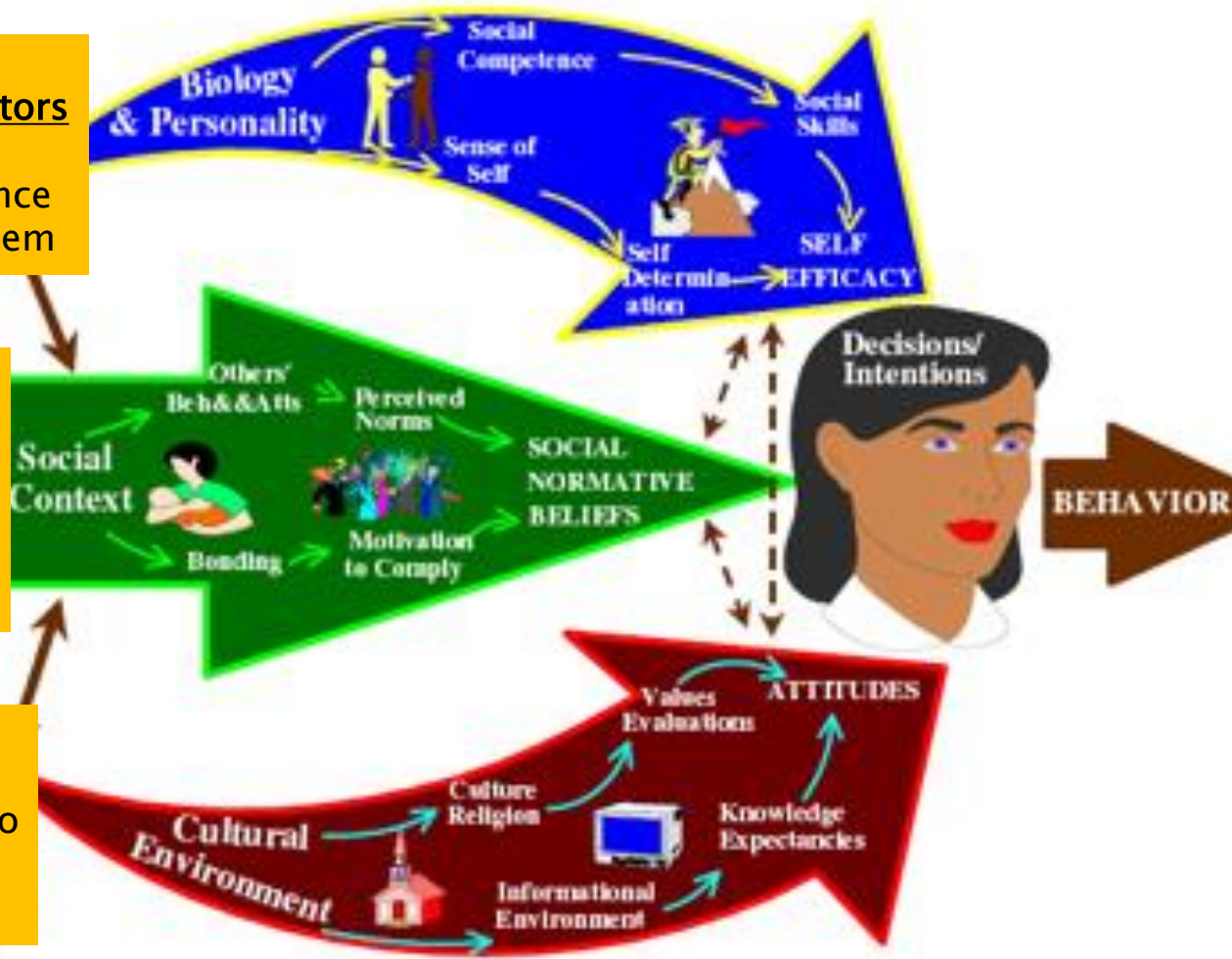
# THE BASICS OF THE THEORY OF TRIADIC INFLUENCE

\*

**Student Intrapersonal Factors**  
gender, age, attitudes, substance use and self-esteem

**Student Social Context Factors**  
Peers and family who smoke and home smoking rules

**School Factors**  
SES, location and density of tobacco retailers



**Outcome**  
susceptible never smoker

# YSS/CSTADS definitions

## “Never Smoker”

- Never smoked a cigarette, not even a puff.

## “Susceptible never smoker” \*

Never smoked (not even a puff)

- Answered “Definitely not” to:
  1. do you think in the future you might try smoking cigarettes?
  2. if any of your best friends were to offer you a cigarette, would you smoke it?
  3. at any time during the next year, do you think you will smoke a cigarette?

\*Pierce et al., 1996

# Statistical analyses

1. Descriptive statistics for total sample & sub-sample (of susceptible non-smokers).
2. Bivariate and multivariate analysis.
3. Multi-level logistic regression analysis.

# RESULTS



# Student-level Findings

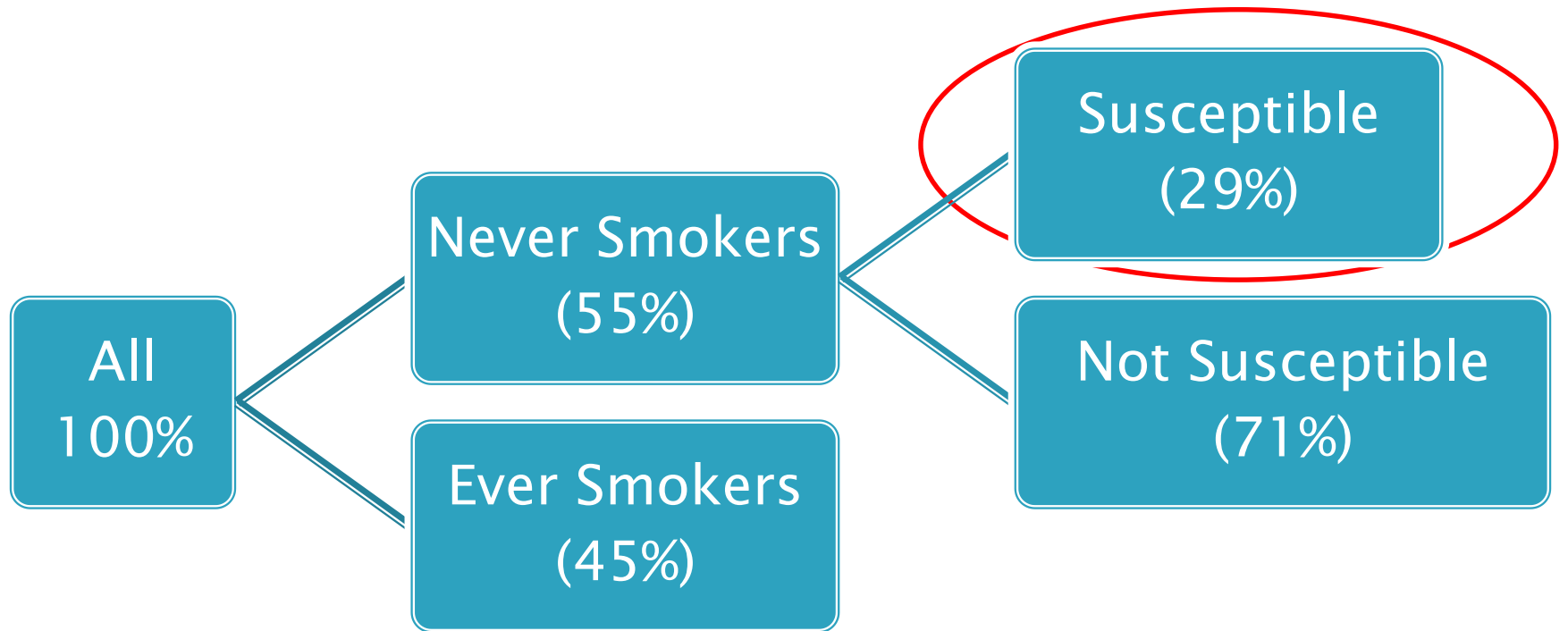
# Descriptive findings

1. 51% of the sample were male, 49% female.
2. The prevalence of susceptible never smokers was not different by gender.
3. Prevalence was different by grade – with students from the lower grades having a higher prevalence of susceptible never smokers.

# Descriptive findings contd..

1. The average prevalence of susceptible never smokers within a school was 28% (range 0% to 58%).
2. 69 out of 133 secondary schools were located in urban areas.
3. Mean number of tobacco retailers within a 1-km radius of each secondary school was about 6 (SD 10 and range was 0 to 49).

# Result #1: Susceptibility to smoking among Never Smokers



# Implication #1: Susceptibility

If  $\frac{1}{3}$  of never smokers are susceptible to smoking in the future.

- ▶ We still need tobacco use prevention programs, in spite of declining prevalence in Canada.

# Result #2: What Student intrapersonal factors are linked to susceptibility?

- ▶ Low self-esteem.
- ▶ Holding positive attitudes towards smoking.
- ▶ Using alcohol or marijuana .

# Implications #2: Intrapersonal factors related to susceptibility

- ▶ Need to target never smokers with low self-esteem, who feel positive about tobacco or use alcohol or marijuana.
- ▶ Need to emphasize comprehensive multifaceted strategies that target multiple factors to improve students 'self-esteem, increase knowledge regarding harms of tobacco use and resist substance use. A good example is the [New Brunswick Student Wellness Strategy](#).

# Result #3: What student social context factors are linked to susceptibility?

- ▶ Having close friends who smoked.
- ▶ Coming from homes without a total ban on smoking.



# Implications #3: Social context factors related to susceptibility

- ▶ Ensure students have skills to resist direct and indirect pressures from peers who smoke.
- ▶ Also target smoking peers and home smoking rules.



# School-level Findings

# Result #4: School-level factors related to susceptibility

- ▶ The Multi-level analysis showed that the percentage of susceptible never smokers varies between schools.
- ▶ This means that the school a student attends is related to the likelihood of a never smoker becoming susceptible to smoking.

# Implication #4a: School-level factors related to susceptibility contd...

- ▶ Important to consider school characteristics beyond/plus individual characteristics to paint a clear picture of susceptibility (multi-level analysis encouraged).

# Implication #4b: School-level factors related to susceptibility contd...

- ▶ While we know schools influence susceptibility, we need further information (research) to understand what about them makes a difference.

# Result #5: School-level factors related to susceptibility contd...

Contrary to other research,

- ▶ Retailer density,
- ▶ Socio-economic status of neighbourhood,
- ▶ Rural/Urban location,

were not linked to smoking susceptibility.

# Implication #5: School-level factors related to susceptibility contd...

While we know that the 3 school factors we tested were not related to susceptibility,

- ▶ We need to explore and evaluate other types of school-level data (e.g. school based tobacco control programs/policies). This would help shed light on the unexplained variability.

# Best Practice

- ▶ Best practices guidelines on smoking prevention recommend comprehensive or multi-pronged approach\* including:
  - school-based programs and/or policies,
  - mass media counter-advertising,
  - community-based strategies,
  - tax policies,
  - smoke-free environments,
  - cessation and tobacco industry denormalization.



# Strengths of the study

- ▶ Provides nationally representative evidence of the importance of multi-level factors for Canadian adolescent smoking behaviors.
- ▶ Examines the factors among adolescents in different smoking stages.
- ▶ Guided by a relevant theory TTI.
- ▶ Uses an appropriate analysis method (Multi-level logistic regression) that captures other factors beyond the individual.

# Potential study limitations

- ▶ YSS and Census data are cross-sectional.
- ▶ Use of secondary data limits one on what variables to use.
- ▶ Use of Census data as the only proxy measure for school SES.
- ▶ There is no information on the reliability and validity of the DMTI-EPOI data.

# Acknowledgements

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## Advisory Committee Members

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**YSS team, SPHHS Faculty, colleagues and Family.**

**Thank you very much for listening!**  
**ASANTE SANA!**

**Any Questions?**  
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