The Application of Reference Group Theory in Chinese Adolescent Smoking

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Background (1/2)

Research Conducted

Fig. 3-8  Present smoking rate of senior high school students over the past years

Health Promotion Administration, Ministry of Health and Welfare (2017)
• Adolescent Tobacco control in Taiwan
  – No person shall provide tobacco products to persons under the age 18.
  – The competition event- eg. “Warning Sign PK”
  – Smoking Cessation Courses
  → Few effective intervention
• The stage of adolescent
  – Socialization
  – Reference group influence
  → Few articles compared various reference groups

Health Promotion Administration, Ministry of Health and Welfare(2017)
Purpose

• We used the reference group theory to explore the main reference group and the type of influence impact adolescent smoking most.
Learning Objectives

• To describe the diversity of adolescent smoking in gender, cities and school systems in Taiwan.

• To explore the main reference group and influence in current adolescent smokers, ever-smokers and non-smokers.
Adolescent Smoking Conceptual Framework

Social-demographic data
City
Gender
School System

Reference group
Types
Family
Parent
Sibling
Relative
Social Group
Peer or friend
Colleague
Religious friend

Social Influence
Normative
utilitarian
value expressive
Informational
Physical Info.
Psycho-
Social Info.

Adolescent Smoking
Smoking Intention
Increase smoking intention
Inhibit smoking intention
Smoking Status
Non-smoker
Ever-smoker
Current smoker
Methods

1. Q methodology
2. Card sorting

Picture Credit: betterevaluation.org

Picture Credit: Game storming
Study Design

Q methodology

- Concourse
  - 2012 senior high faculties
  - 2012 & 2013 smoking student

Focus group transcript

- Q Sample
  - Closed card sorting
    (has been categorized)
    - Reference group
    - Reference group influence

- Q Ranking
  - Only chose “agree”

- Person sample
  - Extensive Person-sample
  - Study Population

Card sorting

- Cards number: 30-100
  - Estimated time:
    30 sec. per card
  → Total: 16 + 28 + 2 = 23 mins.
**Study Population**

- **“Class” as a unit**
- **Total 297 students enrolled**
- **From 4 cities of Taiwan**
- **Senior high school students**
  - Common senior high school
    - Sport class
  - **Vocational** high school
    - PR<50%
  - **Evening** high school
    - PR<50%, vocational
- **Age: 16-18 years old**
- **Enrolled criteria: Chinese readability**
- **Excluded criteria: Age >18; Mental health problems**
Study Instrument

- Cards
  - Reference group
    - Conceptual definition
    - Operational definition
  - Reference group influence
    - Conceptual definition
    - Operational Definition

- Questionnaire
  - Social-demographic data
  - Activity steps

- Sorting sheet
**Study Instrument**

### Smoking status

I am

- □ (1) Current smoker: I have smoked in the last 30 days.
- □ (2) Ever-smoker: I have ever smoked, even one or two times.
- □ (3) Non-smoker: I never smoke.

I think/ I feel/ I observe....

<table>
<thead>
<tr>
<th>Rank</th>
<th>Key person</th>
<th>Sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Father</td>
<td>smoking is cool Therefore, I want to smoke</td>
</tr>
<tr>
<td>3</td>
<td>Key person</td>
<td>do or say something</td>
</tr>
</tbody>
</table>

**Making Sentence**

- Therefore, I don’t want to smoke
Research Ethics

• IRB of National Yang Ming University
• Informed consent for parents
  – One week before the study conducted
• Avoid faculties when doing the research
  – In order to get the honest answer!
• At the end of the study
  – Tobacco control leaflets
  – Small gifts
Data analysis

• Coding → Individual → Group
• Use software excel and SPSS
  – Descriptive Statistics
    • Frequency Distribution
    • Percentage (cross table)
  – Inferential Statistics
    • Chi square test
    • Adjusted residual
**Response rate:** = 85%

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>Current smoker</th>
<th>Ever-smoker</th>
<th>Non-smoker</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N(%)</td>
<td>N(%)</td>
<td>Adjusted Residual</td>
<td>N(%)</td>
<td>Adjusted Residual</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>210(71)</td>
<td>45(21)</td>
<td>-</td>
<td>62(30)</td>
<td>-</td>
</tr>
<tr>
<td>Female</td>
<td>87(29)</td>
<td>17(20)</td>
<td>-</td>
<td>16(18)</td>
<td>-</td>
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<tr>
<td><strong>School System</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common</td>
<td>94(32)</td>
<td>11(12)</td>
<td>-2.6</td>
<td>35(37)</td>
<td>2.9</td>
</tr>
<tr>
<td>Vocational</td>
<td>121(41)</td>
<td>20(17)</td>
<td>-1.5</td>
<td>32(26)</td>
<td>0.1</td>
</tr>
<tr>
<td>Evening</td>
<td>82(28)</td>
<td>31(38)</td>
<td>4.4</td>
<td>11(13)</td>
<td>-3.1</td>
</tr>
<tr>
<td><strong>City</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Taipei</td>
<td>84(28)</td>
<td>14(17)</td>
<td>-1.1</td>
<td>22(26)</td>
<td>0.0</td>
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<tr>
<td>Taichung</td>
<td>95(32)</td>
<td>22(23)</td>
<td>0.7</td>
<td>48(57)</td>
<td>1.7</td>
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<tr>
<td>Tainan</td>
<td>68(23)</td>
<td>9(13)</td>
<td>-1.8</td>
<td>14(21)</td>
<td>-1.2</td>
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<tr>
<td>Taitung</td>
<td>50(17)</td>
<td>17(34)</td>
<td>2.5</td>
<td>11(22)</td>
<td>-0.8</td>
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<tr>
<td><strong>Total</strong></td>
<td>297(100)</td>
<td>62(21)</td>
<td>78(26)</td>
<td>157(53)</td>
<td></td>
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</tbody>
</table>
### Results—Questionnaire (2/5)

<table>
<thead>
<tr>
<th>Families Smoking</th>
<th>All N(%)</th>
<th>Current smoker N(%)</th>
<th>Ever-smoker N(%)</th>
<th>Non-smoker N(%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Father</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>183(61.6)</td>
<td>44(14.8)</td>
<td>53(17.8)</td>
<td>86(29.0)</td>
<td><strong>-2.6</strong></td>
</tr>
<tr>
<td>No</td>
<td>114(38.3)</td>
<td>18(6.1)</td>
<td>25(8.4)</td>
<td>71(23.9)</td>
<td><strong>2.6</strong></td>
</tr>
<tr>
<td>Mother</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>73(24.6)</td>
<td>23(7.7)</td>
<td>15(5.1)</td>
<td>35(11.8)</td>
<td><strong>-1.0</strong></td>
</tr>
<tr>
<td>No</td>
<td>224(75.4)</td>
<td>39(13.1)</td>
<td>63(21.2)</td>
<td>122(41.1)</td>
<td>1.0</td>
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<tr>
<td>Older sibling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>74(24.9)</td>
<td>26(8.8)</td>
<td>22(7.4)</td>
<td>26(8.8)</td>
<td><strong>-3.5</strong></td>
</tr>
<tr>
<td>No</td>
<td>223(75.0)</td>
<td>36(12.1)</td>
<td>56(18.9)</td>
<td>131(44.1)</td>
<td><strong>3.5</strong></td>
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<tr>
<td>Younger Sibling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>5(1.7)</td>
<td>1(0.3)</td>
<td>3(1.0)</td>
<td>1(0.3)</td>
<td>-</td>
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<tr>
<td>No</td>
<td>292(98.3)</td>
<td>61(20.5)</td>
<td>75(25.3)</td>
<td>156(52.5)</td>
<td>-</td>
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<tr>
<td>Grandparent</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Yes</td>
<td>47(15.8)</td>
<td>8(2.7)</td>
<td>13(4.4)</td>
<td>26(8.8)</td>
<td>-</td>
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<tr>
<td>No</td>
<td>250(84.1)</td>
<td>54(18.2)</td>
<td>65(21.9)</td>
<td>131(44.1)</td>
<td>-</td>
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<td>Relatives living together</td>
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<td></td>
<td></td>
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<tr>
<td>Yes</td>
<td>71(23.9)</td>
<td>17(5.7)</td>
<td>19(6.4)</td>
<td>35(11.8)</td>
<td>-</td>
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<tr>
<td>No</td>
<td>226(76.1)</td>
<td>45(15.2)</td>
<td>59(19.9)</td>
<td>122(41.1)</td>
<td>-</td>
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</table>
## Results-Questionnaire (3/5)

<table>
<thead>
<tr>
<th>Social Group Smoking</th>
<th>All</th>
<th>Current Smoker</th>
<th>Ever-smoker</th>
<th>Non-smoker</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N(%)</td>
<td>N(%)</td>
<td>Adjusted Residual</td>
<td>N(%)</td>
</tr>
<tr>
<td>Best friend</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>150(50.5)</td>
<td>54(18.2)</td>
<td>6.5</td>
<td>43(14.5)</td>
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<tr>
<td>No</td>
<td>147(49.5)</td>
<td>8(2.7)</td>
<td>-6.5</td>
<td>35(11.8)</td>
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<tr>
<td>Classmate</td>
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<tr>
<td>Yes</td>
<td>15(5.0)</td>
<td>4(1.3)</td>
<td>-</td>
<td>6(2.0)</td>
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<tr>
<td>No</td>
<td>282(95.0)</td>
<td>58(19.5)</td>
<td>-</td>
<td>72(24.2)</td>
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<tr>
<td>Colleague</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>109(36.7)</td>
<td>41(13.8)</td>
<td>3.7</td>
<td>23(7.7)</td>
</tr>
<tr>
<td>No</td>
<td>31(10.4)</td>
<td>1(0.3)</td>
<td>-3.7</td>
<td>5(1.7)</td>
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<tr>
<td>Club participant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>116(39.0)</td>
<td>20(6.8)</td>
<td>-</td>
<td>28(9.6)</td>
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<tr>
<td>No</td>
<td>177(59.6)</td>
<td>41(14.0)</td>
<td>-</td>
<td>49(16.7)</td>
</tr>
<tr>
<td>Church, Activity participant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>51(17.2)</td>
<td>10(3.4)</td>
<td>-</td>
<td>15(5.0)</td>
</tr>
<tr>
<td>No</td>
<td>246(82.8)</td>
<td>52(17.5)</td>
<td>-</td>
<td>63(21.2)</td>
</tr>
<tr>
<td>Traditional Art Folk participant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>67(22.6)</td>
<td>31(10.4)</td>
<td>5.8</td>
<td>17(5.7)</td>
</tr>
<tr>
<td>No</td>
<td>230(77.4)</td>
<td>31(10.4)</td>
<td>-5.8</td>
<td>61(20.5)</td>
</tr>
</tbody>
</table>
“Peer or friend” (59.7%) was the most important reference group for the intention of current smokers.

“Parent” (59.6%), especially “Father” (43.8%) was the main reference group for the non-smoking intention of non-and-ever smokers.

Normative social influence (69%) was referred more important than informational influence whatever the smoking status was.
<table>
<thead>
<tr>
<th>Type of Reference group</th>
<th>Reference Group Influence</th>
<th>Smoking intention increase</th>
<th>Smoking intention inhibit</th>
<th>Smoking status</th>
<th>Current smoker</th>
<th>Ever smoker</th>
<th>None smoker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer or friend</td>
<td>Smoking</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Encourage me smoking</strong></td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td></td>
<td>Time killer</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Relief stress</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tell me where can smoke</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Hope me not to smoke</strong></td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td></td>
<td>Become poor health</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No smoking</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent</td>
<td>Smoking</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Stop me smoking</strong></td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
</tr>
<tr>
<td></td>
<td>No smoking</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>hope me not to smoke</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• **Increase smoking intention: peer or friend**
  – Peer friends have a great impact on early senior high adolescents (Liao et al., 2013)
  – Due to peer influence and peer selection (Cavalca et al., 2013; Go et al., 2010; Hock et al., 2014; Page, Huong, Chi, & Tien, 2012; Page, Piko, Balazs, & Struk, 2011; Stewart-Knox et al.; 2005; Unger & Chen, 1999)
  – Consistent with adolescent in Helsinki and Barcelona (de Vries et al., 2003)

• **Inhibit smoking intention: parents**
  – Social learning (Kislitsyna et al., 2010)
  – Role model (Lotrean, Mesters, & de Vries, 2012; Schuck, Otten, Engels, & Kleinjan, 2012)

• **Multiplier Effect**
  – Both Peer or friend, parent smoking increase the risk of smoking (Mak et al., 2012; Villanti et al., 2011)
Adolescent smoking behavior is associated with mother smoking
(de Vries et al., 2003; Kislitsyna et al., 2010; Korn et al., 2008; Mak et al., 2012)

Non-smoking behavior of father is associated with non-smoking adolescents
(Forza, et al., 2012; Hock et al., 2014; Hu et al., 2011; Kim-Spoon, Farley, Holmes, Longo, & McCullough, 2014; Ladapo et al., 2014; Mak et al., 2012; Ozturk et al., 2013; Page et al., 2012; Simon-Morton, 2004)

Inhibit smoking intention

- Reference group: Father > mother
- None smoking parents, not allowed smoking: protective factor of adolescent smoking
(Luh et al., 2015; Wu et al, 2012; Yeh et al, 2005)
• “Older sibling”, “colleague” and “art folk participant” are associated with adolescent smoking

(Bektas et al., 2010; Brown et al., 2010; Fletcher, 2010; Hock et al, 2014; Kelly et al., 2011; Lotrean et al., 2012; Vuolo & Staff, 2013; Harakeh et al., 2007)

• Art folk participant
  – “Religion” is the main gathering reason
  – Peer effect: Peer gathering and Lemming effect

• Substance use subculture
  – Art folk v.s. Music festival
    • Art folk: several times gathering, long time practice
    • Music festival: once a year gathering

(Jenkinson, et al., 2014; Wiedermann at el., 2014)
• The influence of adolescent smoking
  – Value-expression influence (Lin & Chen, 2006)

• **Increase** smoking intention
  – Psychosocial informational influence
  – cf. regular smoker: informational influence

• **Inhibit** smoking intention
  – Value-expression influence
  – cf. *nonsmoker* and *initial smoker*: normative

(Sussman, 1989)
Discussion-Influence (5/5)

- **Normative influence and theory of normative social behavior**
  - Subjective norm: eg. "others hope me not to smoke"
    - Smoking behavior depends on their perception of social norm
  - Descriptive norm: eg. "others are all smoking!"
    - What others actually did

- **Informational influence and health belief model**
  - Psycho-social > physical information
  - Perceived Severity: medium or high risk
  - Peer influence is more important than the severity of the disease

- **Smoking cessation classes**
  - Reconstruct the concept of social norm
  - Critical thinking
Art folk in Taiwan

Photo credit: Apple daily
## Conclusion

<table>
<thead>
<tr>
<th>Smoking Intention</th>
<th>Reference Group</th>
<th>Reference Group Influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase smoking intention</td>
<td>Peer or friend</td>
<td>Social-psycho info. Value-expression</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Smoker type</th>
<th>Reference Group</th>
<th>Reference Group Influence</th>
<th>Intention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-smoker</td>
<td>Parents</td>
<td>Value-expression</td>
<td>Tobacco Control education</td>
</tr>
<tr>
<td>Current smoker</td>
<td>Peer or friend</td>
<td>Psycho-Social info. Value-expression</td>
<td>Peer influence eg. Quit &amp; Win</td>
</tr>
<tr>
<td>Ever-smoker</td>
<td>Parents</td>
<td>Value-expression Utilitarian</td>
<td>Non-smoking families</td>
</tr>
</tbody>
</table>


Thank you for your listening!