

## Pathways and prevention in tobacco use

Researchers have identified many risk factors for adolescent smoking initiation [1]. With the exception of tobacco-specific factors, these risk factors tend to be those characteristic of youth problematic behaviors in general [2]. This work is extremely valuable in identifying individual, family and school characteristics that either identify those youths at high risk of becoming smokers and/or should be targets for prevention and other intervention efforts. However, for more specific targeting of prevention activities, it is important to distinguish various subgroups of youths who exhibit specific smoking patterns over time. Many youths will never smoke, others will experiment with smoking only to quit, while some will begin a many years-long smoking career. Obviously, the latter youths are at higher risk from their smoking than the former, and the ability to identify these distinct trajectories can assist the targeting of intervention efforts.

The ability to identify distinct trajectories has been advanced in recent years by the development of new data analytical techniques, including longitudinal forms of cluster analysis [3], variants of latent growth curve modeling [4] and semiparametric group-based modeling approaches [5]. While the existence of differing statistical approaches may appear problematic, it can also be a blessing. Conceptual models that are robust to the precise data analytical choices one makes are more trustworthy than those that depend upon specific choices that could reasonably have been made differently [6]. This robustness is all the more important as researchers adopt new techniques which are mathematically complicated and where standard intuitions for reasonable results may not apply.

Of these approaches to identifying longitudinal trajectories, the longitudinal clustering approach has been adopted to adolescent smoking by Soldz & Cui [7] and the semiparametric group-based approach by Chassin *et al.* [8]. Now Abroms *et al.* [9] apply growth mixture modeling to this issue. The good news is that all three studies, utilizing their varying methodologies and different data sets, identify between five and six subgroups and several of these groups are similar across studies. Thus, all three studies identified groups similar to Abroms *et al.*'s never smoking, early stable, and early experimenters groups. The Abroms *et al.* study included a measure of intention to use, allowing for the identification of a subgroup who expect to smoke in the future but never actually do so. Close examination of this group could be useful in

identifying factors that contributed to their not actually taking up smoking.

Abroms *et al.* find that, in general, the same risk factors that predict smoking initiation also predict more severe longitudinal smoking patterns. Not surprisingly, the number of friends who smoke was highest for the early users. Alarmingly, they found that females were more likely to be in all the smoking groups, but the odds ratio was greatest for the early users, a sign of how much more acceptable smoking became among adolescent girls during the 1990s [10].

Researchers need to work with practitioners to develop strategies to utilize these new strategies for distinguishing among smoking trajectories. If the early users and delayed escalators could be identified early, selective and indicated prevention strategies [11] could be developed for these youths to supplement existing universal prevention strategies of education as to the harmful effects of tobacco, and attempts to make smoking non-normative.

STEPHEN SOLDZ

Director

Center for Research, Evaluation, and Program Development

Boston Graduate School of Psychoanalysis

1581 Beacon Street

Brookline

MA 02446

USA

E-mail: [ssoldz@bgsp.edu](mailto:ssoldz@bgsp.edu)

### References

1. Conrad, K. M. F., Brian, R. & Hill, D. (1992) Why children start smoking cigarettes: predictors of onset. *British Journal of Addiction*, **87**, 1711–1724.
2. Jessor, R. (1987) Problem-behavior theory, psychosocial development, and adolescent problem drinking. *British Journal of Addiction*, **82**, 331–342.
3. Wills, T. A., McNamara, G., Vaccaro, D. & Hirky, A. (1996) Escalated substance use: a longitudinal grouping analysis from early to middle adolescence. *Journal of Abnormal Psychology*, **105**, 166–180.
4. Muthen, B. & Muthen, L. K. (2000) Integrating person-centered and variable-centered analyses: growth mixture modeling with latent trajectory classes. *Alcoholism: Clinical and Experimental Research*, **24**, 882–891.
5. Nagin, D. S. (1999) Analyzing developmental trajectories: a semiparametric, group-based approach. *Psychological Methods*, **4**, 139–157.

6. De Leeuw, J. (1994) *Statistics and the sciences*. UCLA Statistics Preprints, pp. 1–20. Los Angeles, CA: UCLA.
7. Soldz, S. & Cui, X. (2002) Pathways through adolescent smoking: a seven-year longitudinal grouping analysis. *Health Psychology*, **21**, 495–504.
8. Chassin, L., Presson, C. C., Pitts, S. C. & Sherman, S. J. (2000) The natural history of cigarette smoking from adolescence to adulthood in a midwestern community sample: multiple trajectories and their psychosocial correlates. *Health Psychology*, **19**, 223–231.
9. Abrams, L., Simons-Morton, B., Haynie, D. L. & Chen, R. (2005) Psychosocial predictors of smoking trajectories during middle and high school. *Addiction*, **100**, 852–861.
10. Soldz, S., Kreiner, P., Clark, T. W. & Krakow, M. (2000) Tobacco use among Massachusetts youth: is tobacco control working? *Preventive Medicine*, **31**, 287–295.
11. National Institute on Drug Abuse (1997) *Drug Abuse Prevention: What Works?* Rockville, MD: National Institutes of Health, US Department of Health and Human Services.