WORLD CONFERENCE ON TOBACCO CONTROL 2025
DUBLIN, IRELAND 23 - 25 JUNE 2025
WORLDTOBACCOCONTROL.ORG
The Union
With support from Bloomberg Philanthropies

When Neighbors Smoke: How Multiunit Housing Residents Experience Tobacco Smoke Intrusion

Lydia Greiner, DrPH[1]; Georg Matt, PhD[1]; Savannah Yurcek, BSPH[2]; Miguel Mejia, BA[2]
[1]San Diego State University; [2]San Diego State University Research Foundation

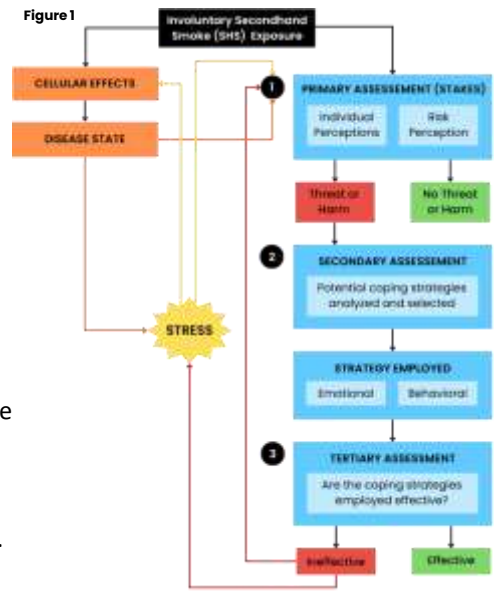
E-Poster No. 712

Background

Environmental Exposure and Stress
Exposure to environmental hazards like noise pollution, air pollution, and crowding is known to negatively impact human health through direct physical pathways (i.e., cochlear trauma due to prolonged noise exposure) and indirectly through the stress response when the demands of the environmental exposure exceed ability to adapt. [1]

Lazarus and Folkman[2] propose a three-stage model of adaptation:
Stage 1: Exposure is perceived, and the level of threat or harm is appraised.
Stage 2: Behavioral and emotional coping strategies are analyzed and selected to respond to the threat.
Stage 3: If the threat persists, the first two stages are repeated, taking into account changes in perception and resources. This stage is experienced as annoyance.

Figure 1



Secondhand Smoke
- The direct, physical pathway of secondhand smoke exposure on health have been well-studied. Even short-term exposure is known to cause immediate cellular effects, including inflammatory reactions in airways, reduced lung function, damage to the lining of blood vessels, and increased "stickiness" of platelets.[3]
- Longer-term exposure can cause heart disease, lung cancer, and stroke in adults and increased risk of sudden infant death syndrome, acute respiratory infections, and asthma exacerbation in children.[3]
- The indirect pathway through the stress response is not as well-studied, however the negative health impacts of acute and chronic stress (regardless of cause) are well-documented.

Secondhand Smoke Exposure in Multiunit Housing
- Overall, the adoption of smokefree policies in many indoor environments has corresponded with a decline in secondhand smoke exposure in nonsmokers from 87.5% in 1988 to 24.3% in 2020.[4]
- In multi-unit housing, adoption of smokefree policies has been less robust. Exposure to secondhand smoke remains a well-documented issue, even in units where smoking is not allowed, with 23%-46% of tenants reporting intrusion.[5-7] This disproportionately affects low-income and vulnerable populations.
- To fully understand the scope of the impact of secondhand smoke exposure in multiunit housing, the indirect effects through the stress response should be considered.

The purpose of this study was to explore multiunit housing residents' perception, evaluation, and response to tobacco smoke intrusion into their apartment homes.

Methods

Participant Recruitment
Recruitment was carried out by community partner organizations using the following inclusion criteria: Residents of affordable multiunit housing within San Diego County; strict home smoking ban; non-user of combustible and non-combustible commercial tobacco, e-cigs, cannabis; lived with non-users of combustible and non-combustible commercial tobacco, e-cigs, cannabis; and deny secondhand smoke exposure.

Participant Classification
Based on reported intrusion, 51 participants were categorized as "current intrusion" (i.e., weekly intrusion for at least the past month), and 65 were categorized as "no current intrusion" defined as having no intrusion (n=48), transient intrusion (n=7), or historical intrusion (n=10).

Data Collection and Statistical Analysis
After obtaining IRB approval, structured in-person interviews were conducted by trained research assistants between February 2019-September 2022. Statistical analysis was conducted using STATA.

Perception and Appraisal of Exposure
Six domains of environmental exposure, adapted from Evans and Cohen[8], were used to measure participants' perception and appraisal of tobacco smoke exposure.

1. **Salience:** 10 items assessed salience (i.e., how easily intrusion was noticed). Two items assessed physical symptoms and seven items, derived from Rosen et. al.[9], assessed sensory experience of intrusion.
2. **Duration and Periodicity:** Four items assessed frequency of intrusion episodes and overall length of time since intrusion was first noticed.
3. **Control:** Three items assessed property smoking rules, community knowledge of and communication about rules.
4. **Responsibility:** Two items assessed source of the intrusion and community adherence to smoking rules.
5. **Predictability:** Two items assessed variation in timing and intensity of intrusion.
6. **Risk Perception:** Two items assessed acute and chronic exposure to secondhand smoke.

Adaptive Response: Two items assessed behavioral strategy (i.e., reporting to building management, reporting to health care provider).

Stress: One item assessed distress caused by tobacco smoke intrusion.

Results

SAMPLE CHARACTERISTICS

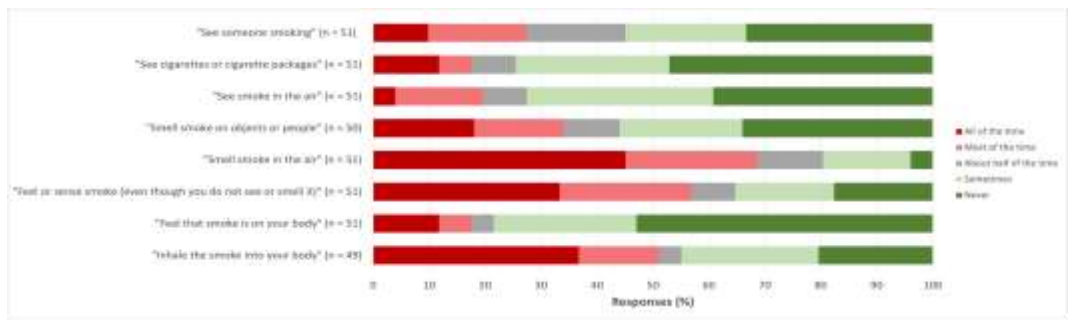
Participants (N=116) were largely female (86.2%), Hispanic (75%), not employed (73.3%), with an annual household income ≤ $30,000 (59.5%). Less than 1/3 (30.2%) reported prior smoking. Participants who reported current intrusion of tobacco smoke (n=51) were more educated, more likely to report previous smoking, and better informed about the smoking restrictions in their apartment complex than participants who did not (n=65).

PERCEPTION AND APPRAISAL OF EXPOSURE

Six Domains of Environmental Exposure

SALIENCE

When tobacco smoke comes into your apartment, how often do you…



DURATION AND PERIODICITY	
First time noticed intrusion	
≥1 - < 6 months ago	4 (7.8)
≥6 - <12 months ago	5 (9.8)
≥12 months ago	42 (82.4)
Last time noticed intrusion	
Today	11 (21.6)
Yesterday	7 (13.7)
This week	16 (31.3)
This month	12 (23.5)
Other	5 (9.8)
On average, how often notice intrusion	
Daily	16 (31.4)
3-4 times per week	12 (23.5)
1 time per week	11 (21.6)
1-2 times per month	9 (17.7)
Other	3 (5.9)
# of days noticed intrusion in past week	
0	
≤1	19 (37.2)
2-3	11 (21.6)
4-5	7 (13.7)
6-7	14 (27.4)

PREDICTABLITY	
Notice at different times in a day	27 (52.9)
Is worse sometimes	35 (68.6)
CONTROL	
Smoking is restricted in apartment complex	
Yes	32 (62.7)
No	15 (29.4)
Don't know	4 (7.8)
Resident's understanding of the rules (N=32)	
All residents understand the rules	5 (15.6)
Most understand most rules	9 (28.1)
Some understand some rules	8 (25)
A few understand a few rules	7 (21.9)
No residents understand the rules	3 (9.3)
Communication of rules (N=32)	
Posted on signs in common areas	22 (68.8)
Included in rental agreement	24 (75)
Management explains at move in	18 (56.3)
RESPONSIBILITY	
Source of intrusion	
I know where it's coming from	48 (98.1)
Over past year, saw rules being broken (N=32)	
Never	4 (12.5)
Once in a while	7 (21.9)
Often	8 (25)
Almost always	13 (40.6)

RISK PERCEPTION

ADAPTIVE RESPONSE

Behavioral Coping Strategies

45.5% of those who experienced physical symptoms reported them to their health care provider.

60.8% of those who experienced intrusion reported it to their property manager or landlord.

STRESS

Distress Level

Conclusions

This study explored multiunit housing residents' perception, evaluation, and response to secondhand smoke that intrudes into their homes from neighboring units, hallways, and common areas. Secondhand smoke, like other environmental exposures, acts on human health directly through physical pathways and indirectly through the stress response. The stress response occurs when the demands of the environmental exposure exceed the individual's ability to adapt. The direct health impacts of secondhand smoke have been well-documented; indirect health impacts through the stress response have received less attention.

Results suggest that the demands of secondhand smoke intrusion often exceed the individual's ability to adapt, despite behavioral adaptations. Participants characterized secondhand smoke intrusion as salient, of long duration with frequent episodes, outside individual control, caused by actions of others, unpredictable, and associated with health risk—all characteristics consistent with an environmental exposure that represents a threat to health. Behavioral adaptations were used, but overall, they were not successful. Distress was remarkably high, with >50% reporting "extreme" distress.

Secondhand smoke intrusion in multiunit housing is an under-recognized stressful life event with few effective behavioral adaptations, particularly for the vulnerable populations who are most likely to experience this environmental exposure. In many communities, affordable housing demand exceeds supply, and current smokefree housing policies are insufficient to protect the public from secondhand smoke intrusion. Emotional adaptations (e.g., changing the perception of harm associated with the exposure) are undesirable, as there is no safe level of exposure to secondhand smoke.

Secondhand smoke intrusion represents an environmental exposure that proves difficult to adapt to and thus has the potential to lead to negative health effects through the indirect pathway of both acute and chronic stress response. Further research is needed to better understand the stress response and its indirect effects of secondhand smoke intrusion, and to characterize the relationships among the direct and indirect health effects of secondhand smoke exposure.

References
1. Cohen, S., Kessler, R. C., & Gordon, L. U. (1995). Strategies for measuring stress in studies of psychiatric and physical disorders. *Measuring stress: A guide for health and social scientists*, *28*, 3-26.
2. Lazarus, R. S. (1984). *Stress, appraisal, and coping* (Vol. 464). Springer.
3. U.S. Centers for Disease Control and Prevention (2025, January 31). *Health problems caused by secondhand smoke.* https://www.cdc.gov/tobacco/secondhand-smoke/health.html
4. National Cancer Institute, NIH, DHHS (2025, April) *Cancer Trends Progress Report: Secondhand Smoke Exposure.* https://progressreport.cancer.gov
5. Repace, J. L. (2024). Secondhand smoke Infiltration in multiunit housing: Health effects and nicotine levels. *Indoor Environments*, *1*(2), 100013.
6. Sangmo, L., Liu, B., Elaiho, C., Boguski, L., Yaker, M., Resnick, M., Malbari, A., & Wilson, K. M. (2021). Reported Marijuana and Tobacco smoke incursions among families living in multiunit housing in New York City. *Academic Pediatrics*, *21*(4), 670-676.
7. Zajac, L., Gallate, X., Gu, G., Liu, B., Elaiho, C., Lin, E., Mogilner, L., Oliver, K., Vangeepuram, N., & Wilson, K. (2022). Disparities in Marijuana and Tobacco smoke incursions among New York City families during early months of the COVID-19 pandemic. *Journal of Public Health Management and Practice*, *28*(3), 248-257.
8. Evans GW and Cohen S (1987) Environmental Stress. In Handbook of Environmental Psychology. Vol. 1. Daniel Stokols and Irwin Altman, eds. John Wiley & Sons.
9. Rosen, L. J., Lev, E., Guttman, N., Tillinger, E., Rosenblat, S., Zucker, D. M., & Myers, V. (2018). Parental perceptions and misconceptions of child tobacco smoke exposure. *Nicotine and Tobacco Research*, *20*(11), 1369-1377.

We acknowledge the contributions of United Women of East Africa Support Team for their assistance with participant recruitment and community education. This study was supported by California Tobacco-Related Disease Research Program Grant # 27IR-0019 .