

Psychosocial Predictors of Continued E-Cigarette Use in Youth
Request for Information on Psychosocial Predictors of Uptake of Tobacco and Other
Products

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E-cigarette use among youth is increasing at alarming rates. Data from the National Youth Tobacco Survey indicates current e-cigarette use rates tripled from 2013-2014 among middle (1.1% to 3.9%) and high school (4.5% to 13.4%) students, and e-cigarettes were the most commonly used tobacco product¹. Of particular concern is that certain aspects of e-cigarettes may be appealing to youth (e.g., good flavors, the ability to use e-cigarettes in places where cigarettes are not allowed) which may lead to initiation and continued use. The use of e-cigarettes by youth is especially concerning given that little is known about the health effects of e-cigarettes at this time.

Published research has identified several reasons that youth cite for first trying e-cigarettes including: curiosity, thinking it is cool, good flavors, it doesn't smell bad, can hide use from adults, low cost, friends or parents/family use it, the ability to use it anywhere, to quit smoking cigarettes, and believing that e-cigarettes are healthier than cigarettes². We need to know not just what attracts youth to trying the product, but also whether these aspects of the product relate to continued use over time. We have currently unpublished data which suggests that certain reasons for first trying e-cigarettes relate to continued e-cigarette use and more frequent e-cigarette use over time.

We used longitudinal evidence from anonymous surveys conducted in November 2013 and May 2014 among middle and high school students in CT. This sample (n=2100) was 47% female, mostly White, and 15.6 years old on average. Among those youth who had ever tried e-cigarettes at the first survey in fall 2013, we measured continued use based on whether or not these same youth reported e-cigarette use in the past 30 days at the second survey in spring 2014. We also measured number of days youth reported using e-cigarettes in the past 30 days in spring 2014 to capture e-cigarette frequency. Almost half of those who had used e-cigarettes in fall 2013 reported that they continued using e-cigarettes in the past month in spring 2014. Additionally, youth who continued e-cigarette use reported using e-cigarettes almost 50% more frequently in spring 2014 compared to fall 2013. In summary, youth are continuing to use e-cigarettes and use them at higher rates over time.

Youth who reported trying e-cigarettes because of the low cost were more than twice as likely to continue e-cigarette use and were using e-cigarettes more frequently over time.

¹ Centers for Disease Control and Prevention (CDC). 2015. Tobacco use among middle and high school students—United States, 2011-2014. MMWR Morb Mortal Wkly Rep. 64, 381-385.

² Kong, G., Morean, M.E., Cavallo, D.A., Camenga, D.R., Krishnan-Sarin, S. 2015. Reasons for electronic cigarette experimentation and discontinuation among adolescents and young adults. Nicotine Tob Res. 17, 847-854.

Youth find the low cost of e-cigarettes appealing and those who endorse this as a reason that they were interested in trying e-cigarettes are at greater risk for continued use and more frequent use over time. In our sample, youth who reported trying e-cigarettes because of the low cost were using more than twice as many days out of the past 30 compared to those who did not endorse this reason.

Although the pricing of e-cigarettes and other tobacco products are set at the state level, the FDA should prohibit the sale of e-cigarettes to minors at the federal level. There is evidence from tobacco control efforts related to conventional cigarettes that increasing the price of cigarettes is the most impactful way to reduce youth smoking rates^{3,4} and similar strategies may be needed for e-cigarettes.

Youth who reported trying e-cigarettes because they can use them anywhere were more than twice as likely to continue e-cigarette use and were using e-cigarettes more frequently.

In our sample, youth who reported trying e-cigarettes because they can use them anywhere were using almost twice as many days on average out of the past 30 compared to those who did not endorse this reason. Similar findings are seen in a published study of adults where those who reported trying e-cigarettes to use them in places where smoking is not allowed were more likely to continue e-cigarette use over time⁵. This suggests e-cigarettes may be used to maintain cigarette smoking behavior in places where smoking is currently prohibited which could undermine significant advances to reduce second-hand exposure and change public perceptions around smoking behavior. The FDA should ban the use of e-cigarettes in public places.

Youth who were current cigarette smokers were more than twice as likely to continue e-cigarette use over time compared to non-smokers.

E-cigarette use among youth smokers did not lead to decreased cigarette use. Instead, the majority of youth who were cigarette smokers at our first survey were engaging in dual use of cigarettes and e-cigarettes at the second survey. Among smokers, median cigarette frequency in the past 30 days doubled from fall 2013 to spring 2014. This raises concerns that use of e-cigarettes was not leading to cessation of regular cigarettes, and dual use could lead to greater nicotine exposure and nicotine addiction in youth.

In summary, data show strong evidence for the rise and widespread popularity of e-cigarette use among youth, and emerging data identifies that many youth who experiment with e-cigarettes continue to use them over time. Continued use of e-cigarettes among youth is of great concern from a public health perspective and could potentially undermine significant advances made toward reducing tobacco use among youth in the U.S. Therefore, regulation

³ Wilson, L.M., Tang, E.A., Chandler, G., Hutton, H.E., Odelola, O.A., et al. 2012. Impact of Tobacco Control interventions on smoking initiation, cessation, and prevalence: A systematic review. *J Environ Public Health*. 2012, 961724.

⁴ van Hasselt, M., Kruger, J., Han, B., Caraballo, R.S., Penne, M.A., Loomis, B., Gfroerer, J.C. 2015. The relation between tobacco taxes and youth and young adult smoking: What happened following the 2009 U.S. federal tax increase on cigarettes? *Addict Behav*. 45, 104-109.

⁵ Pepper, J.K., Ribisl, K.M., Emery, S.L., Brewer, N.T. 2014. Reasons for starting and stopping electronic cigarette use. *Int J Environ Res Public Health*. 11, 10345-10361.

efforts, such as increasing cost and prohibiting and enforcing e-cigarette sales to adolescents may be important for reducing risk of long-term e-cigarette use in youth.