



Original article

The Changing Role of Self-Efficacy in Adolescent Smoking Initiation

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A B S T R A C T

Background: Refusal self-efficacy is assumed to be linked to adolescent smoking. The aim of the present study was to examine the changing role of self-efficacy in adolescent smoking over time while controlling for parental, sibling, and friends' smoking.

Methods: This study used data from five annual waves of the "Family and Health" project. A total of 428 adolescents (mean age = 13.3 years; standard deviation = .48) and their parents participated at baseline. Only never smokers at baseline (n = 272) were included to measure smoking initiation. First, the effects of baseline self-efficacy, parental, sibling, and friends' smoking on adolescent smoking initiation at measurement five were examined. Second, with latent growth curves analyses, individual growth curve parameters of adolescent smoking, self-efficacy, parental, sibling, and friends' smoking were calculated. Subsequently, these growth parameters were used to predict growth of adolescent smoking.

Results: Findings showed that baseline self-efficacy, parental and friends' smoking did not predict adolescent smoking at wave five, but baseline sibling smoking did. However, growth curve parameters showed that a decrease in self-efficacy, an increase in proportion of smoking friends, and an increase in sibling smoking over time were related to an increase in adolescent smoking. Initial levels of sibling and friends' smoking moderated the link between self-efficacy and adolescent smoking over time.

Conclusion: A decrease in self-efficacy over time, rather than baseline self-efficacy, is associated with smoking initiation in adolescence. Findings emphasize the need for more fine-grained analyses when looking at self-efficacy or other individual characteristics that might fluctuate over time.

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Adolescents smoking acquisition is a dynamic process consisting of different stages [1]. In The Netherlands, in 2008, 27% of adolescents aged 13 years tried smoking occasionally. This increased to 41% at the age of 14, and then increased further up to 63% by the age of 17 [2]. One way to prevent adolescent smoking is by strengthening individual skills to reduce the likelihood that adolescents would start experimenting. Individual predictors of smoking initiation have been widely studied (for reviews, see [1,3–5]). One important individual factor

is refusal self-efficacy [6–9], which refers to adolescents' confidence in their ability to stay a nonsmoker and to refuse a cigarette [6,10]. Little is known about the development of self-efficacy in adolescence and its relationship to smoking initiation. Increased insights into the effects of self-efficacy on adolescent smoking might contribute to the development of more effective prevention programs.

Self-efficacy is a key construct in many health behavior models, such as the Theory of Planned Behavior [11], Social Cognitive Theory [12], and the Attitude-Social Influence-Self-efficacy Model [6]. These theories have been widely used to explain smoking initiation in youths [5]. Empirical research with cross-sectional designs has shown that higher levels of self-efficacy relate to lower rates of smoking initiation [6].

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Longitudinal studies on the link between self-efficacy and adolescent smoking are scarce [9,13,14]. These studies found that high baseline self-efficacy negatively affects smoking initiation. Despite the longitudinal nature of these studies, self-efficacy was always measured at one point in time. However, self-efficacy is not a static concept [15], and levels of self-efficacy fluctuate over time. For instance, most teenagers enter adolescence as nonsmokers, with high levels of self-efficacy to refuse smoking. However, during adolescence, smoking might become more age-related and more accepted behavior, individuals might encounter more situations in which people smoke, and norms toward smoking generally become more positive in adolescence than in childhood [16]. As a consequence, self-efficacy to refuse smoking might decrease, whereas the likelihood to start smoking increases. Thus, it is important to observe the changes in self-efficacy over time.

To our knowledge, Chang et al [17] conducted the only study that concentrates on changes in self-efficacy over time. They examined whether changes in self-efficacy and friends' smoking predicted smoking initiation among 1,654 adolescents. Findings showed that lower self-efficacy and having more smoking friends between 10th and 12th grades predicted smoking initiation by 12th grade. Although self-efficacy was measured prospectively, Chang et al [17] predicted adolescent smoking at 12th grade by computing the difference in self-efficacy between 10th and 12th grades rather than assessing fluctuations in self-efficacy over time within this interval, potentially leading to an underestimation of self-efficacy. To accurately measure the effects of self-efficacy on smoking, it might be more important to assess self-efficacy at various time points, and thus test the effects of baseline self-efficacy as well as the effect of changes in self-efficacy over time.

As important environmental factors, exposure to smoking parents [8,18,19], siblings, and friends [3,4,19,20] is associated with adolescent smoking. Parental smoking affects the likelihood that adolescents will initiate smoking and escalate to more severe patterns [1,8]. Moreover, although previous research reported that smoking behavior of an older sibling influences adolescent smoking initiation [3,21], friends' smoking is considered a stronger predictor of adolescent smoking as compared with sibling smoking [3]. Adolescents with smoking friends are more likely to smoke themselves compared with adolescents with nonsmoking friends [4,20]. Thus, parental, sibling, and friends' smoking can be considered as important environmental factors in adolescent smoking.

The Present Study

The aim of the present study is to test how baseline refusal self-efficacy and changes in refusal self-efficacy predict smoking over time while taking into account parental, sibling, and friends' smoking. We expect that changes in self-efficacy over time, rather than self-efficacy measured at one or two points in time, offer a more complete and comprehensive picture of the role of self-efficacy. In addition, we will test whether parental, sibling, and friends' smoking moderates the link between self-efficacy and adolescent smoking because we also expect interplay between individual and environmental factors.

Methods

Procedure

Data used for the present study were obtained from five waves of the "Family and Health" project; a longitudinal Dutch study on factors underlying various health behaviors in adolescence [22]. Addresses of the families consisting of father, mother, and two children aged 13–16 years were selected from 22 municipality registers. A letter was sent to all the families inviting them to participate. A total of 885 families responded, of which 765 fulfilled the inclusion criteria (i.e., parents had to be married or live together and all family members needed to be biologically related). A further selection was made to obtain an equal division of education and an equal amount of sibling duality (i.e., boy-boy, boy-girl, girl-girl, and girl-boy). Finally, 428 families were selected to participate. All data were collected in five annual waves with approximately 12 months-intervals. Data collection for baseline measurement (T1) took place between November 2002 and April 2003.

The numbers of participating families were 416 (T2), 404 (T3), 356 (T4), and 326 (T5), which is a response of 76% across the five waves.

At T1, an interviewer visited the families at home. During this visit, each family member was asked to fill out questionnaires individually. To ensure anonymity, participants were asked to sit separately from each other and not to talk with each other. It took approximately 90 minutes to complete the questionnaire. At the annual follow-up waves (T2–T5), most of the families had another visit from an interviewer but some families received the questionnaire by mail for practical and financial reasons. The proportions of families who responded by mail were 8% (T2), 24% (T3), 11% (T4), and 25% (T5). Each family received €30 per wave if all family members completed the questionnaires.

Sample characteristics

In the present study, we only focused on never smoking youngest adolescents at T1. This allowed us to examine the development of self-efficacy and smoking initiation in adolescence. Of the initial sample, 272 (63.6%) adolescents reported never smoking at T1. At T1, the mean age of the youth was 13.3 years (standard deviation [SD] = .48; range, 13–15 years), 52% were female adolescents, and the majority was Dutch (95.2%). With regard to education, 1.1% of the youth followed lower education (i.e., preparatory secondary school for technical and vocational training), 26.7% intermediate or general education, 70.7% the highest level of secondary school (i.e., preparatory college and university education), and 1.5% some other form of education. Attrition analyses comparing adolescents who participated in five waves and those who dropped out, showed that adolescents who dropped out were less likely to follow higher education (odds ratio [OR] = .62, 95% confidence interval [CI] = .44 – .90, $p = .01$).

Measures

Adolescent smoking

At each wave, participants were asked to report the stage of smoking which applied to them on a nine-point scale [23]. Response categories ranged from 1 (I have never smoked, not even one puff) to 9 (I smoke at least once a day) [22,24].

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