



# Does cigarette price influence adolescent experimentation?

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## Abstract

The economics literature generally agrees that state and federal excise taxes can play an important role in deterring adolescent smoking. Teens' apparent responsiveness to cigarette prices is puzzling, since the majority of adolescent smokers do not buy their cigarettes. Teens typically do not begin to purchase cigarettes until they have developed an established pattern of smoking. Previous studies have not had adequate measures of smoking experience to explore whether adolescents' price responsiveness may vary by smoking experience. This paper uses data from a 1993 national survey of youth smoking to explore this hypothesis. © 2001 Elsevier Science B.V. All rights reserved.

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## 1. Introduction

There is general agreement in the economics literature that by raising the price of cigarettes, state and federal excise taxes can play an important role in deterring adolescent smoking (Lewit et al., 1981; National Cancer Institute, 1993; Chaloupka and Grossman, 1996; Evans and Huang, 1998; Gruber, 2000). However, a number of studies have not found the expected relationship between cigarette prices and adolescent smoking (Chaloupka, 1991; Wasserman et al., 1991; Douglas and Hariharan, 1994; DeCicca et al., 1998). One reason for this lack of consensus might be that adolescents are not a homogeneous group with respect to price sensitivity. Gruber and Zinman's (2000) recent findings support this hypothesis. They showed that younger adolescents (8th and 10th grade) were not price sensitive, whereas high school seniors (12th grade) were quite sensitive to cigarette prices; the

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estimated smoking participation elasticity for 12th graders ( $-0.67$ ) was significant and very similar to other's estimates (Lewit et al., 1981; Chaloupka and Grossman, 1996; Gruber and Zinman, 2000).

Studies of the natural history of smoking also support the heterogeneity hypothesis. Younger smokers tend to be in the very early stages of smoking uptake, when most report obtaining cigarettes from friends. In order to be sensitive to cigarette prices, it is necessary to purchase or at least contemplate purchasing cigarettes. Therefore, it is not surprising that younger adolescents may not be price sensitive. Previous research suggests that it is typically not until the later adolescent years (e.g. 16–18 years old), when they start to smoke on a daily basis, that adolescent smokers also start to purchase their own cigarettes. The critical smoking level at which adolescents begin to purchase cigarettes— and therefore may become sensitive to cigarette prices — is approximately one cigarette per day on average (Emery et al., 1999). The theory of rational addiction also supports the hypothesis that experimenters may be different from other smokers, since they have not yet built up sufficient addictive capital to make future cigarette consumption and cigarette prices a serious consideration (Chaloupka, 1991).

Although experimenters may not yet have developed an addiction to nicotine, they are still an important group to study. Many adolescents who experiment with cigarettes may never go on to battle a lifelong addiction to nicotine. However, there is substantial evidence that for some, the first few cigarettes are enough to trigger a vulnerability to nicotine dependence (Pomerleau, 1995; Pomerleau et al., 1999). Previous research showed that 30–70% of experimenters eventually progress to dependence (US Department of Health and Human Services, 1994; Gilpin et al., 1999). Moreover, adolescents consistently underestimate the risk of becoming addicted to smoking (US Department of Health and Human Services, 1994; Gruber and Zinman, 2000), and therefore may see no danger in experimenting.

There appear to be many societal and policy influences that effect the probability that an individual adolescent will proceed from experimentation to dependent smoking, and whether price is one of these influences is an important question. Most previous studies of the effect of price on adolescent smoking, however, have measured smoking participation with a dichotomous variable indicating whether or not the adolescent smoked in the past 30 days. Such a measure is limited because experimenters are categorized with heavier smokers, along with those who may report having recently quit smoking. Each group might respond differently to factors, such as cigarette prices, that could influence their smoking behaviors. The inconsistencies among the adolescent price elasticity estimates in the literature may at least partly reflect differences in the smoking experience or measurement of smoking in the study samples. This paper specifically examines the relationship between experience with smoking and adolescent price sensitivity in a 1993 national cross-section of adolescents. Section 2 describes the datasets and statistical methods used. Section 3 summarizes our results, and Section 4 discusses our findings in the context of other studies and public policy.

## 2. Data and methods

This study employed data from the second wave (1993) of the longitudinal teenage attitudes and practices survey (TAPS). The first wave of TAPS was coordinated by one of

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