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## SMOKING RESTRICTIONS AS A SELF-CONTROL MECHANISM

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**Smoking Restrictions as a Self-Control Mechanism**  
(forthcoming *Journal of Risk and Uncertainty*)

Joni Hersch<sup>\*</sup>

*Abstract*

Using data from Current Population Survey Tobacco Use Supplements spanning 1992 – 2002, this study shows that smokers who plan to quit smoking are more supportive of regulations than are other smokers. Failed quitters who plan to try again are more supportive of restrictions than are smokers planning to quit for the first time. These findings indicate that many smokers support regulatory restrictions to reduce their costs of quitting by exploiting the discipline offered by regulatory control. From 1992 to 2002, support for smoking restrictions in public areas rose dramatically among both nonsmokers and smokers.

Key words: Time-inconsistency, addiction, smoking restrictions, smoking cessation, cigarettes.

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Introduction

Quitting smoking is not easy. Many smokers report repeated unsuccessful efforts to quit smoking. In 1988, the U.S. Surgeon General labeled smoking an “addiction,” with attendant physical and psychological costs of quitting (U.S. Department of Health and Human Services, 1988). Despite these costs of quitting, smoking cessation is not uncommon, as there are about as many former smokers as current smokers.

Smokers seeking to quit should attempt to facilitate smoking cessation by reducing the costs of quitting. Smokers attempting to quit smoking commonly use quitting aids such as nicotine gum and smoking clinics to lower quitting costs, and use practices such as wagers or rationing of cigarette purchases in order to encourage self-control. In this paper I examine the role of government regulations on smoking in public areas as a means of reducing quitting costs. Smoking cessation is of particular interest to the economics of choice under uncertainty. The smoking decision reflects a risky consumer choice, and smoking cessation behavior may reflect time inconsistency with respect to this risky consumer choice.

Why smokers may support smoking regulations has not been examined in the economics literature, and indeed may seem counterintuitive. Smokers might be expected to oppose smoking restrictions, as regulations limit their choices and consequently should always be welfare reducing. After all, smokers could always voluntarily opt to refrain from smoking in public areas, so regulations presumably could only lower their utility.

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Whether smokers support such regulations will depend on a comparison of the costs of restrictions to the benefits of restrictions. The costs consist of limitations on smoking behavior. However, smokers may also perceive restrictions as beneficial. If smokers are seeking to quit smoking, smoking regulations can serve as a means of fostering their own self-control. In effect, smokers' options will be limited externally so that unlike private self-control devices, there will be no opportunity for smokers to have a momentary lapse and undo the imposed restrictions.<sup>1</sup> Smokers may also derive benefits from curtailing environmental tobacco smoke from other smokers.

Using data from four waves of the Current Population Survey Tobacco Use Supplements, conducted in 1992 – 93, 1995 – 96, 1998 – 99, and 2001 – 02, I provide direct evidence on preferences for smoking restrictions in the public areas of restaurants, hospitals, indoor work areas, bars and cocktail lounges, indoor sporting events, and indoor shopping malls. As individual preferences over government policy do not translate into observable market behavior, stated preferences provide the only available information on preferences. Support for smoking restrictions among never smokers, former smokers, and current smokers increased dramatically over the 11-year period covered by the data, with support for restrictions among current smokers far below that of nonsmokers.

I then examine the link between plans to quit smoking and preferences for regulations. The results show that although smokers are generally far less supportive of regulations than are nonsmokers, smokers who plan to quit in the near future are more supportive of regulations than are other smokers. Smokers who have tried to quit in the past but failed and plan to try again should

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<sup>1</sup> Schelling (1978) hypothesized that smokers might support regulations that would prevent them from smoking, noting (p. 291): “If there were some way that cigarettes could be reliably put beyond reach, and people could vote on whether they would like that done, it is a fair guess that a majority of the smokers would elect to deny themselves any possibility of lighting another cigarette.” Schelling (1984) discusses a number of methods used to pre-commit to behavior in anticipation of loss of self-command in the future.

have higher costs of quitting and consequently should value restrictions more highly than smokers planning to quit for the first time. Empirically, support for regulation is higher among repeat quitters. Although all smokers who anticipate quitting benefit from clean air induced by preventing others from smoking in public areas, the comparison of failed quitters planning to try again to smokers planning to quit for the first time indicates that some smokers favor regulatory restrictions to reduce their costs of quitting by exploiting the discipline offered by regulatory control.

The findings of this paper help distinguish between the two principal alternative economic models of addiction: models of rational addiction and models incorporating time-inconsistent behavior. While both frameworks allow for failed quitting attempts, and both frameworks allow for support for government regulations that would restrict others from smoking, rational addiction would not have a constructive role for any constraints on individual choices such as those imposed by government regulations. The greater support for regulations among failed quitters who plan to try again to quit than among planned quitters who have not yet experienced a failure in their quit attempts indicates that smokers do not understand the difficulty of quitting when making initial smoking decisions and seek methods that pre-commit them to restricting their smoking. This finding lends support to models in which addictive behavior is irrational, such as models incorporating time-inconsistency.

## 1. Background

The empirical analysis examines the relation between failed and planned quit attempts and support for smoking restrictions among current smokers. Quitting alone implies some effort to reverse an earlier decision. How one would interpret unsuccessful quitting behavior depends on

the economic model of smoking behavior. The dominant model used to explain the temporal dimension of smoking behavior is the rational addiction model of Becker and Murphy (1988.) In their model, consumers optimally make smoking decisions recognizing the addictive properties of cigarettes and all costs including current and future cigarette prices, health costs, and costs of quitting. Time consistency is a key assumption of the rational addiction model. A rational addict who plans to terminate his addiction may use quitting aids and may experiment with various methods to reduce the short-term loss of utility associated with stopping. As Becker and Murphy discuss (1988, p. 693), unsuccessful quitters are still searching for a low-pain way of stopping smoking.<sup>2</sup> As smokers internalize all costs in this framework, tax and regulatory policy should be set only to eliminate externalities associated with smoking.<sup>3</sup>

The main alternative to the rational addiction model is one in which smokers demonstrate time-inconsistent behavior. In this framework, smokers apply a higher discount rate to decisions closer to the present than to the future. This formulation has been borne out in various models of hyperbolic discounting.<sup>4</sup> Such models emphasize limits on self-control. Although smokers may have taken up smoking with the intent of quitting sometime in the future, when the future arrives they find that quitting is more difficult than they expected.<sup>5</sup> As Gruber and Koszegi (2001) describe, the two features that distinguish time consistent from time inconsistent agents are the use of commitment devices or self-control techniques and the inability to meet intentions with

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<sup>2</sup> Suranovic, Goldfarb, and Leonard (1999) introduce quitting costs into a model of rational addiction to explain the seeming inconsistency between smokers' expressed desire to quit and their failure to do so.

<sup>3</sup> The magnitude of externalities associated with smoking has been the subject of substantial debate. See Viscusi (2002).

<sup>4</sup> See for example Laibson (1997). Frederick, Loewenstein, and O'Donoghue (2002) survey the literature.

<sup>5</sup> Prior to the widespread adoption of the rational addiction model, most models of addictive consumption behavior assumed time-inconsistent behavior. For example, Schelling (1978, p. 290) describes smokers who are trying to quit smoking as behaving as two people in a "continual contest for control." Thaler and Shefrin (1981) refer to an individual at any point in time as both a "farsighted planner and a myopic doer." Recently research into areas such as savings behavior as well as smoking has incorporated time-inconsistent behavior. See Gruber and Köszegi (2001) and Gruber and Mullainathan (2002) for applications of a model of time-inconsistency to smoking behavior and references to other literature incorporating time inconsistency. For a recent review of the rational addiction and self-control debate, see Gruber (2002-2003) and Viscusi (2002-2003).

respect to quitting. In this framework, a greater role for government intervention may be warranted to reduce the costs of smoking cessation to smokers themselves, as smoking restrictions function as an externally imposed form of discipline that forces smokers to curtail their smoking.<sup>6</sup>

Given the critical policy importance of tobacco regulation, a number of empirical studies have tested whether smokers behave in a manner consistent with the rational addiction model. A key empirical prediction of the rational addiction model is that smokers are forward-looking with respect to future tobacco prices. While much of the empirical literature supports this prediction, Gruber and Köszegi (2001) show that time-inconsistent smokers also display forward-looking behavior. Given the similarity in the two models' predictions, research based on price responsiveness alone cannot reliably distinguish between rational addiction and time-inconsistency.

The difficulty of distinguishing between the two frameworks based on price responsiveness suggests that we explore other evidence to establish the socially desirable level of government regulation, such as smokers' own assessments of the value of government regulation of smoking behavior. One such study is by Gruber and Mullainathan (2002), who find that higher cigarette excise taxes increase self-reported happiness of predicted smokers. This finding supports time-inconsistency by showing that smokers are made better off by the presence of taxes as a self-control device.<sup>7</sup>

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<sup>6</sup> Laux (2000) discusses three situations in which market failures arise within the rational addiction framework, thereby justifying greater government intervention. First, smoking decisions made by teens impose an externality on their future selves. Second, the discount rates calculated from rational addiction models are consistent with partial myopia. Third, the presence of peer effects makes the welfare implications of regulations ambiguous and may suggest a greater role for regulation.

<sup>7</sup> Another approach has been to examine differences in the ability to quit smoking to distinguish between models of rational addiction and time inconsistency. See for example Keeler, Marciniak, and Hu (1999) and Jones (1994). However, these studies do not examine the role of government regulations in influencing quitting behavior. Keeler, Marciniak, and Hu (1999) argue that the rational addiction model implies that successful quitters and unsuccessful

The approach I take is to examine individual smoker preferences for regulations on smoking in public areas. Regulations that restrict smoking in public areas may lower the costs to smokers of quitting by acting as a commitment device. As Hersch, Del Rossi, and Viscusi (2004) show, individual preferences over smoking restrictions map into government policy, as actual tobacco regulations within a state are consistent with preferences of voters within the state.<sup>8</sup> Such regulations once passed cannot be reversed if smokers find that regulations did not lower their costs of quitting. Direct evidence on smokers' own preferences for regulation provides information on whether smokers are made better off by the presence of regulations on smoking.

## 2. Empirical Framework

The relation between support for regulations and plans to quit smoking can be analyzed by comparing the costs of quitting to the benefits of quitting. I assume that individuals who plan to quit are expressing a judgment that the discounted expected utility they will receive as a nonsmoker exceeds that associated with continuing to smoke. Reducing the transaction costs of switching from the smoking state to the nonsmoking state will enable these individuals to be on their preferred consumption trajectory. Government restrictions on smoking can potentially reduce these costs for smokers.

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quitters will have similar economic incentives to quit and will differ only in that successful quitters have found a low-pain way of stopping, and unsuccessful quitters are still searching. They find that relative to those who have never tried to quit, successful and unsuccessful quitters respond similarly to economic incentives, which they interpret as support for the rational addiction model. Although not directly contrasting the rational addiction model with a model of self-control, Jones (1994) examines successful and failed quit attempts using British data from the Health and Lifestyle survey. He finds that social class and education do not affect attempts to quit, but those in higher social classes (and to a lesser extent those with more education) are more likely to be successful. These results imply that self-control models better explain quitting than does the rational addiction model.

<sup>8</sup> To the extent that political bodies are responsive to voter preferences, as implied by models of political economy, this is the nature of information they will take into account in implementing policy. Furthermore, stated preferences are widely accepted in fields in which market behavior cannot be observed. For example, measures of willingness to pay are widely used in the environmental economics literature.



Smokers will support smoking restrictions if the costs imposed on them by restrictions are less than the benefits of restrictions. The cost of restrictions to smokers is that they will either need to eliminate their smoking in the restricted areas or take breaks to smoke outside the restricted areas, usually outdoors. These costs will be an increasing function of the number of cigarettes smoked daily since a higher frequency of smoking increases the number of foregone or inconvenient smoking experiences.

Smokers may also reap benefits from restrictions. Smokers may value clean air during periods when they are not smoking so realize a benefit from restrictions that prevent others from smoking. This benefit value is a decreasing function of the number of cigarettes smoked per day, because a higher frequency of smoking decreases the number of clean air, nonsmoking periods enjoyed by the smoker. The second class of benefits is that smoking restrictions may assist smokers in curtailing smoking. There is extensive evidence that smoking is reduced by higher taxes, workplace restrictions, and government regulations.<sup>9</sup> Smoking restrictions consequently may foster individual efforts to quit smoking. The benefit of regulations will be positively related to past quit attempts if unsuccessful quitters are still searching for mechanisms to lower the costs of quitting.

The empirical analysis examines support for smoking restrictions among current smokers. These smokers are distinguished on the basis of their past quit attempts and their current quit intentions, as well as on their intensity of smoking. I estimate equations of the form

$$(1) \Pr(R_j = 1) = \Phi(\alpha + \gamma Cigarettes + \beta Try\ again + \lambda First\ try + \delta X + \phi State + \eta Year),$$

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<sup>9</sup> Surveys of the literature are provided by U.S. Department of Health and Human Services (2000) and by Chaloupka and Warner (2000). For recent studies of the effect of restrictions on smoking behavior, see Douglas (1998) who shows that the quitting hazard is increased by state level of regulation on smoking, Evans, Farrelly, and Montgomery (1999) who find that workplace smoking bans reduce smoking prevalence and cigarette consumption, and Yurekli and Zhang (2000) who find that anti-smoking laws reduced per capita cigarette consumption within states.

where  $R_j$  represents preferences for the  $j$ th regulation, and is equal to one if the respondent favors banning smoking in that public area, and zero otherwise. *Cigarettes* is the average number of cigarettes smoked per day by the respondent. Smokers are divided into three different groups based on their quit intentions and behavior. *Try again* is an indicator variable equal to one if the respondent tried to quit in the past and plans to try again in the near future. *First try* is an indicator variable equal to one if the respondent plans to make a first quit attempt in the next six months. The omitted category is smokers who do not intend to try to quit in the next 6 months. The vector  $X$  consists of individual characteristics that potentially affect preferences for regulation, such as education and income. *State* is a vector of state indicator variables to control for all state specific characteristics including tobacco prices and excise taxes within the state and the presence and enforcement of existing regulations. *Year* is a vector of indicator variables denoting survey year to allow for time trends in support for smoking regulations.

The role of the three smoking explanatory variables in influencing preferences for restrictions can be cast within the framework reflecting the benefits and costs that restrictions generate for smokers. Smokers who smoke more cigarettes per day should be less likely to support restrictions for two reasons: the costs of smoking restrictions increase as the number of restricted smoking periods increases, and the benefits to smokers of clean air produced by less exposure to others' smoke decline as the number of periods that the individual is not smoking is reduced.

The two quit variables each should have a positive effect on support for restrictions if smokers who are planning to quit perceive regulations as welfare enhancing. First, those planning to quit will benefit from reduced environmental tobacco smoke if others are prevented from smoking in public areas. Second, restrictions may reduce quitting costs. To distinguish

between support for restrictions that limit others' smoking in public areas from support for restrictions that will reduce the smoker's own costs of quitting, I compare support for smoking restrictions of smokers who have attempted unsuccessfully to quit and plan to try again to smokers attempting to quit for the first time. For those trying to quit, the benefit of clean air when not smoking will not differ based on whether there have been past quit attempts. But the costs of quitting will vary among smokers, and failed quit attempts provide new information to smokers about their own quitting costs. Smokers who have never tried to quit have not yet experienced failure and would assess their quitting costs to be lower than the quitting costs of failed quitters. If regulations reduce quitting costs, smokers who failed in past quit attempts but still seek to quit smoking will be more supportive of restrictions than are those who have never tried unsuccessfully to quit smoking. Finding higher support for restrictions among smokers trying again to quit than among smokers trying to quit for the first time (that is,  $\beta > \lambda$ ) suggests that, in addition to benefits of clean air, restrictions provide additional value by reducing the costs of quitting.

### 3. Data

I use data from the Current Population Survey (CPS) Tobacco Use Supplements. The Tobacco Use Supplements were conducted in conjunction with the CPS in 1992 – 93, 1995 – 96, 1998 – 99, and 2001 – 02, with three surveys conducted in each year (September, January and May through 1999, and in June, November and February for 2001-02).<sup>10</sup> The CPS is

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<sup>10</sup> Specifically, the Tobacco Use Supplements were conducted in September 1992, January 1993, May 1993, September 1995, January 1996, May 1996, September 1998, January 1999, May 1999, June 2001, November 2001, and February 2002. An abbreviated tobacco use survey was conducted in January 2000 and May 2000 but these surveys do not report information on quit behavior or regulatory preferences and are not used in this study. These supplements were sponsored by the National Cancer Institute for data collected through 2000, and co-sponsored by the National Cancer Institute and Centers for Disease Control and Prevention for data collected in 2001 – 02.

administered by the U.S. Census Bureau and is a nationally representative monthly survey of approximately 48,000 (for the 1998 – 99 supplements) – 57,000 households (for the other supplements.) The CPS reports information for all persons in the household 15 years and older on a range of employment, individual, and household characteristics. The specific information of interest provided in the supplements includes smoking status, quit attempts and plans, and preferences for restrictions on smoking in six different public areas. While other data sets report information on current smoking status and quit attempts, individual preferences for regulations on smoking in public areas seem to be uniquely available in these supplements.

The supplement questions on tobacco use start by asking respondents to report whether each individual household member age 15 or older had smoked at least 100 cigarettes in their lifetime. Those household members who had not smoked at least 100 cigarettes were classified as never smokers, with the remainder classified as former smokers, someday smokers, and everyday smokers based on responses to follow-up questions. Excluding those missing information on smoking status, the sample is comprised of over 1 million observations. The smoking rate ranges from a high of 22.9 percent in 1992 – 93 to a low of 19.8 percent in 2001 – 02. Former smokers comprise 22.0 percent of the sample in 1992 – 93, dropping to 20.9 percent by 2001 – 02. These numbers accord with smoking rates reported elsewhere.<sup>11</sup>

Although proxy respondents were asked to report smoking status for all household members age 15 and older, they were not asked to report quitting behavior and preferences for regulation, so only self-respondents are included in the following analyses. I restrict the sample to those age 18 and older, and also restrict the sample to those without missing information on preferences for any of the six regulations on smoking in public areas. This sample is comprised of never

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<sup>11</sup> See for example the Centers for Disease Control website, [http://www.cdc.gov/tobacco/research\\_data/adults\\_prev/adstat1.htm](http://www.cdc.gov/tobacco/research_data/adults_prev/adstat1.htm).

smokers, former smokers, everyday smokers, and someday smokers, and the total number of observations is 744,558, ranging from 167,641 in 1998 – 99 to 222,057 in 1992 – 93. Until the 2001 – 02 survey, only everyday smokers were asked to report their efforts to quit smoking. To use a consistent sample over all years of the survey, in the regressions analyzing the relation between preferences for regulations and quit behavior, I restrict the sample to everyday smokers who report their quit efforts, quit plans, and number of cigarettes smoked. This subsample has 130,262 observations.

Preferences for tobacco regulation were elicited by asking respondents, “In [public area], do you think that smoking should be allowed in all areas, in some areas, or not allowed at all?” for each of the public areas of restaurants, hospitals, indoor work areas, bars and cocktail lounges, indoor sporting events, and indoor shopping malls. Most respondents favored at least some restrictions on smoking in public areas. The dependent variables in the regulatory preferences equations are set equal to one if the respondent reported that they favored not allowing smoking at all in that public area, and zero if they reported that smoking should be allowed in all or in some areas.

Everyday smokers (and someday smokers beginning in 2001) were asked whether they had ever stopped smoking for one day or longer because they were trying to quit smoking. Both someday and everyday smokers were asked whether they were seriously considering stopping smoking within the next 6 months and within the next 30 days. Respondents were asked to respond “yes” or “no” to each of these questions. In the equations estimating preferences for regulations among everyday smokers, I include indicator variables for the mutually exclusive categories of smokers who have tried to quit in the past and plan to try again within the next 6 months, and smokers who plan to make a first effort to quit smoking within the next 6 months.

The omitted category is comprised of smokers who do not plan to quit. Overall, forty percent of everyday smokers report that they plan to attempt to quit in the next 6 months.<sup>12</sup> Most of those planning to quit have tried previously but failed, with 88 percent of those planning to quit reporting that they had tried to quit in the past.

The number of states with existing regulations in these public areas differed considerably by type of regulation, as did the stringency of regulations that were in effect. For example, by January 1999, only 4 states had any type of smoking restriction in bars, while 43 states had some restriction on smoking in hospitals but only 6 states had an outright ban of smoking in hospitals.<sup>13</sup> To control for state-level differences in excise taxes, actual regulation of tobacco and potentially differential enforcement, and social norms pertaining to smoking in public areas, I include state-specific fixed effects in the equations. Other variables used in the analyses are age, gender, family income, marital status, education, race, Hispanic ethnicity, employment status, and indicators for survey year.<sup>14</sup>

Before turning to the regression results examining the relation between quit behavior and preferences for regulations among smokers, it is useful to examine the trends in preferences for

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<sup>12</sup> As former smokers comprise only 23.8 percent of the entire sample, these quit plans probably wildly overstate the share that actually will quit successfully in this upcoming attempt.

<sup>13</sup> These statistics are reported in Hersch, Del Rossi, and Viscusi (2004), Table 3.

<sup>14</sup> Family income is reported in 14 ranges from the lowest category of less than \$5000 to the top category of more than \$75,000. I assign the midpoint of the range for the first 13 categories and assign \$80,000 to those in the top category. Those missing information on family income are included in the regressions by assigning zero to those with missing values and including an indicator variable to denote missing information on family income. Family income is converted to 1992 dollars using the CPI-U. Education is reported in the CPS in 16 categories that correspond to number of years of completed schooling, a range such as “some college,” or to degrees received. I assign number of years of education based on these categories using midpoints when ranges are provided. Starting in January 1998, the CPS records additional information on number of completed schooling. For those with some college but not a college degree, the CPS reports years of college credit. For those with a master’s degree, the number of years for the master’s program is reported. I use this information to more precisely assign years of education for those with some college or with master’s degrees for the surveys for 1998 onward. Race is reported in 4 broad categories in the CPS of white; black; American Indian, Aleut, Eskimo; and Asian or Pacific Islander. A category for “other” was deleted in January 1996. I omit from the sample the few observations with this race code before it was discontinued. Hispanic ethnicity was recorded beginning in September 1995 and can be constructed from information on “origin” in earlier surveys.

regulation over time and to compare regulatory preferences of nonsmokers to current smokers. Table 1 reports the percentage of respondents favoring smoking bans reported in each survey year, stratified by smoking status into never smokers, former smokers, and current smokers, where current smokers include both everyday and someday smokers. Three points are noteworthy. First, preferences for smoking bans in public areas are closely related to smoking status. Never smokers are far more supportive of smoking bans than current smokers. Former smokers are less likely to support smoking bans than are never smokers, but have preferences much closer to never smokers than to current smokers.<sup>15</sup> For example, by 2001 – 02, 69 percent of never smokers favored banning smoking in restaurants, as did 57 percent of former smokers. Among current smokers, only 26 percent favored a smoking ban in restaurants.

Second, even within this 11 year time period, there has been a remarkable increase in support for smoking bans among smokers as well as among nonsmokers. For example, in 1992 – 93, 70 percent of never smokers favored smoking bans in indoor work areas, as did 59 percent of former smokers. But among current smokers, only 30 percent favored a smoking ban in indoor work areas in 1992 – 93. However, by 2001 – 02, support for smoking bans in indoor work areas had risen considerably among all groups, with bans favored by 83 percent of never smokers, 74 percent of former smokers, and 51 percent of current smokers. Support for smoking bans in all public areas but bars and cocktail lounges increased among current smokers by at least 10 percentage points over the 1992 – 2002 period.

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<sup>15</sup> Whether former smokers would be expected to be more or less supportive of regulations than never smokers is not clear within the framework of this paper. Both never smokers and former smokers benefit from restricting the smoking of others and do not have their choice set restricted by regulations. If former smokers fear lapsing and resuming smoking, they may be more supportive of regulations than never smokers. However, as successful quitters, former smokers may have lower costs of quitting as well as a greater tolerance for exposure to cigarettes, especially if friends and family members smoke.

Third, there is little support for bans on smoking in bars. Fewer than half of the respondents in each of the smoking status groups support banning smoking in bars and cocktail lounges. Only 9 percent of smokers support a ban by 2001 – 02. Although nonsmokers are more supportive than are smokers of smoking bans in bars, there is less support for banning smoking in bars than for bans on smoking in all other public areas.

Turning now to the sample of everyday smokers, Table 2 shows how preferences for smoking bans in public areas also vary by smoking cessation efforts and plans among everyday smokers.<sup>16</sup> Except for preferences for smoking bans in bars, smokers who have tried to quit in the past and plan to try again in the next 6 months are uniformly and statistically significantly more supportive of regulations than are smokers who plan to try to quit for the first time, who in turn are more supportive of regulations than those who do not plan to quit. Support for smoking bans among those who plan to quit for the first time are much closer to that of failed quitters who plan to try again to quit than to smokers who do not plan to quit. The gaps in support for restrictions by quit plans are considerable. For example, 45 percent of smokers who have tried to quit in the past and plan to try again favor smoking bans in indoor work areas, in contrast to only 29 percent of smokers who do not plan to quit. Similarly large disparities in support are observed for all other public areas with the exception of support for smoking bans in bars.

Table 2 also presents descriptive statistics for characteristics that may affect preferences for regulations. Those who have tried to quit and plan to try again have significantly higher family income and education and are more likely to be married or employed relative to smokers in the other two groups, while these characteristics do not differ significantly between those who plan

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<sup>16</sup> Table 2 reports sample characteristics averaged over all years rather than for each year as in Table 1. Because the preference values for current smokers in Table 1 include someday smokers as well as everyday smokers, the total number of smokers in Table 1 exceeds that of Table 2, and the preferences among current smokers in Table 1 are not simply a weighted average of the preferences among everyday smokers in Table 2.



to quit for the first time and those who do not plan to quit. While the average number of cigarettes smoked per day varies significantly among the three groups, the differences are not dramatic, with those who tried to quit in the past and plan to try again averaging only 2.5 fewer cigarettes per day than those not planning to quit.

#### 4. Regression Results

While the descriptive statistics reported in Table 2 suggest that those who plan to quit smoking are more supportive of smoking regulations than those who do not plan to quit, the stronger support for regulations may be caused by other factors correlated with quit plans. For example, those who have attempted to quit smoking and plan to try again are in higher income households and have more education than those who do not plan to quit. There is a negative income elasticity for willingness to bear health risks so income and proxies for lifetime wealth such as education may influence preferences.<sup>17</sup> This section provides estimates of preferences for regulation in each of the six public areas, controlling for characteristics that are expected to influence preferences as well as indicator variables for state of residence and year.

Table 3 reports the probit estimates of the probability of favoring smoking bans in each of the six public areas, where the reported coefficients are the marginal effects of each variable. First note the temporal trend in support for bans on smoking in public areas. Relative to the first wave of the CPS Tobacco Use Supplement conducted in 1992 – 93, smokers report steadily increasing, and sometimes dramatically greater, support for smoking bans over time. Support for smoking bans in hospitals and indoor work areas increased by 23 percentage points by 2001 – 02, while the increase in support for bans in indoor shopping malls was 29 percentage points.

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<sup>17</sup> See Viscusi and Aldy (2003) for a survey of the literature on willingness to incur health risks.

The increase in support over this period for smoking bans in restaurants and indoor sporting events was smaller but still considerable, at 10 percentage points.

Second, note the effects of cigarette consumption on support for smoking bans. Smokers who smoke greater quantities are likely to find smoking bans in public areas more inconvenient than smokers who consume fewer cigarettes, and the consistent statistically significant inverse relation between number of cigarettes smoked and support for smoking bans bears this out. The magnitude of the effect of number of cigarettes on support for smoking bans varies by public area. For all public areas but bars, each additional cigarette reduces support for smoking bans by a magnitude ranging from 0.5 percent to 0.8 percent, with the corresponding magnitude for bars a smaller but statistically significant 0.1 percent.

Third, quit plans have a strong influence on preferences for regulations. Relative to smokers who do not plan to quit smoking, those who plan to quit are far more likely to favor banning smoking in public areas. All of the coefficients on the quit plan variables are statistically significant at the 99 percent level, and the magnitudes of the coefficients are fairly large. With the exception of bars, support among those who tried to quit and plan to try again relative to those not planning to quit smoking ranges from 10.8 percentage points for restaurant bans to 15.6 percentage points for indoor shopping mall bans. Those planning for the first time to quit smoking also are far more supportive of banning smoking than those not planning to quit. Support among those planning for the first time to quit relative to those not planning to quit is about 10 percentage points higher for all public areas but bars.

Fourth, quit history matters. Except for smoking bans in bars, those who attempted unsuccessfully to quit in the past and plan to try again are more supportive of smoking bans than are those who plan to quit for the first time and have not yet experienced failure. It is

particularly noteworthy that for every public area except bars, the coefficients on plans to quit among those who have failed in the past are significantly larger at the 99 percent level than the coefficients on plans to quit for the first time (chi squared tests reported in the last row of Table 3.) The differences in support by past quit efforts are considerable for hospitals, indoor work areas, indoor sporting events, and malls, with coefficients 38 percent higher (for indoor work areas) to 61 percent higher (for indoor sporting events) for those who tried to quit in the past and plan to try again than for those quitting for the first time. The disparity in support for a smoking ban in restaurants is statistically significant although smaller, at 18 percent.

Other factors often but not always have a statistically significant influence on preferences for regulation, but the magnitudes of the effects tend to be small relative to the effects of quit plans. When the effects of other factors are significant, they generally affect preferences in the same direction in each equation, but there are exceptions. Relative to respondents classified as white, respondents classified as African American or Asian are more supportive of regulations. Similarly, respondents classified as Hispanic are more supportive of regulations than non-Hispanics. Relative to those never married, married people are more supportive of smoking bans in all public areas but indoor work areas, while those previously married are more supportive of bans in restaurants and less supportive of bans in indoor work areas. Those employed are more supportive of bans in hospitals, indoor work areas, sporting events, and malls, but less supportive of bans in restaurants and bars. The effects of gender, family income, and education vary by type of regulation. Men are less supportive than are women of bans in indoor work areas, sporting events, and malls, but are more supportive of regulations in restaurants, hospitals, and bars. Those with higher family income are more likely to favor smoking bans in hospitals and indoor work areas, but less likely to favor bans in bars and malls. Those with more education are

less likely to support bans in restaurants, hospitals, bars, and malls, and more likely to support bans in indoor work areas.

It is also notable that although other factors also influence regulatory preferences, most notably race and ethnicity, the unadjusted gaps in support for smoking bans reported in Table 2 are similar to the regression-adjusted gaps reported in Table 3. As an example, consider preferences for banning smoking in indoor work areas. As Table 2 shows, without adjusting for other preference-related characteristics, smokers who have tried to quit and plan to try again are 16.3 percentage points more likely to support smoking bans in indoor work areas than those who do not plan to quit, while those who plan to try for the first time are 11.0 percentage points more likely to support bans. Controlling for state, income and demographic characteristics narrows the disparity somewhat, with smokers who have tried to quit and plan to try again 14.1 percentage points more supportive of smoking bans in indoor work areas than smokers not planning to quit, and smokers who are planning to quit for the first time 10.2 percentage points more supportive. The unadjusted and regression-adjusted disparities are also similar for the other public areas. These results suggests that demographics and state fixed effects play a minor role relative to quit plans in influencing preferences for bans on smoking in public areas.

To summarize the findings, smokers planning to attempt to quit are far more supportive of smoking bans in public areas than are smokers who do not plan to quit. Smokers who have tried to quit in the past and plan to try again are more supportive of regulations than are those planning to try to quit for the first time. Those who consume more cigarettes are less supportive of regulations. These findings suggest that smokers who plan to quit value smoking restrictions. In part, smokers planning to quit will value restrictions that prevent others from smoking. But smokers also value restrictions to reduce the costs of quitting. Indeed, the greater support for

restrictions among failed quitters planning to try again relative to smokers planning to quit for the first time indicates an additional benefit of regulation.

## 5. Conclusion

Most states regulate smoking in at least some public areas, and smoking regulations have been shown to reduce the amount of smoking. I show that support for regulation in public areas has increased dramatically over the 1992 – 2002 period among smokers as well as nonsmokers. Furthermore, although smokers are generally far less supportive of regulations than are nonsmokers, smokers who plan to quit in the near future are far more supportive of regulations of smoking in public areas than are other smokers. These findings suggest that government regulations that restrict smoking may enhance smoker welfare by serving as a self-control mechanism that reduces the costs of quitting. In this situation, limitations on choice may be welfare enhancing, particularly for smokers seeking to quit.<sup>18</sup>

The surprising support for regulations among attempted quitters suggests a greater role for government regulation than is usually recognized in the rational addiction framework. In the rational addiction framework, tax and regulatory policy should be set only to eliminate externalities associated with smoking. In contrast, models of time-inconsistency and other models postulating irrationalities in smoking decisions would imply that government policy should be set to eliminate not only externalities, but also to offset the costs on smokers themselves that arise from their failure to properly anticipate the difficulties associated with quitting. Irrespective of the underlying model of smoking behavior, finding that would-be quitters are more supportive than non-quitters of smoking regulations lends political support to observed trends in anti-smoking regulatory policies.

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<sup>18</sup> A related finding of the unexpected benefits of smoking restrictions is that of Alamar and Glantz (2004), who find that smoke-free ordinances actually increase the profitability of restaurants as reflected in the sale price.

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**Table 1: Percent Favoring Smoking Bans, by Smoking Status and Survey Year<sup>a</sup>**

| Place of smoking ban and survey year | Never smokers | Former smokers | Current smokers |
|--------------------------------------|---------------|----------------|-----------------|
| <b>Restaurants</b>                   |               |                |                 |
| 1992-93                              | 57.4          | 46.1           | 15.4            |
| 1995-96                              | 61.3          | 48.8           | 18.3            |
| 1998-99                              | 64.3          | 51.6           | 21.4            |
| 2001-02                              | 69.4          | 57.0           | 25.9            |
| <b>Hospitals</b>                     |               |                |                 |
| 1992-93                              | 83.7          | 75.3           | 52.6            |
| 1995-96                              | 86.0          | 78.3           | 59.1            |
| 1998-99                              | 88.9          | 82.2           | 67.6            |
| 2001-02                              | 91.4          | 86.3           | 74.2            |
| <b>Indoor work areas</b>             |               |                |                 |
| 1992-93                              | 69.9          | 59.2           | 29.7            |
| 1995-96                              | 74.1          | 62.7           | 34.9            |
| 1998-99                              | 78.3          | 67.7           | 43.1            |
| 2001-02                              | 83.2          | 73.8           | 51.1            |
| <b>Bars &amp; cocktail lounges</b>   |               |                |                 |
| 1992-93                              | 33.1          | 24.5           | 5.0             |
| 1995-96                              | 36.0          | 26.0           | 6.6             |
| 1998-99                              | 38.9          | 28.9           | 7.8             |
| 2001-02                              | 43.0          | 30.8           | 8.9             |
| <b>Indoor sporting events</b>        |               |                |                 |
| 1992-93                              | 75.2          | 70.9           | 49.7            |
| 1995-96                              | 76.5          | 71.5           | 50.3            |
| 1998-99                              | 79.1          | 74.5           | 54.6            |
| 2001-02                              | 83.4          | 79.7           | 61.3            |
| <b>Indoor shopping malls</b>         |               |                |                 |
| 1992-93                              | 65.0          | 56.0           | 31.4            |
| 1995-96                              | 71.9          | 63.0           | 40.0            |
| 1998-99                              | 77.5          | 69.6           | 50.2            |
| 2001-02                              | 82.8          | 76.3           | 59.8            |
| <b>Number of observations</b>        |               |                |                 |
| 1992-93                              | 114,187       | 54,132         | 53,738          |
| 1995-96                              | 94,213        | 42,284         | 41,636          |
| 1998-99                              | 91,034        | 39,912         | 36,695          |
| 2001-02                              | 98,713        | 41,235         | 36,779          |



a. Data source: Current Population Survey Tobacco Use Supplements conducted in 1992-93, 1995-96, 1998-99, and 2001-02. Sample is composed of self-respondents to the Tobacco Use Supplement. Respondents with missing values for preferences for any of the six public areas, with missing smoking status, or under age 18 are excluded.

**Table 2: Sample Characteristics of Everyday Smokers  
by Plans to Quit Status<sup>a</sup>**

| Characteristic                       | Tried to quit,<br>plans to try<br>again | Plans to try to<br>quit for first<br>time | No plans to quit<br>smoking | Significant<br>differences <sup>b</sup> |
|--------------------------------------|---|---|-----------------------------|---|
| <i>Percent favoring smoking bans</i> |   |   |                             |   |
| Restaurants                          | 24.4<br>(42.9)                          | 21.4<br>(41.0)                            | 12.4<br>(32.9)              | a, b, c                                 |
| Hospitals                            | 69.3<br>(46.1)                          | 65.3<br>(47.6)                            | 53.0<br>(49.9)              | a, b, c                                 |
| Indoor work<br>areas                 | 45.2<br>(49.8)                          | 39.9<br>(49.6)                            | 28.9<br>(45.3)              | a, b, c                                 |
| Bars & cocktail<br>lounges           | 8.2<br>(27.4)                           | 7.8<br>(26.8)                             | 4.7<br>(21.1)               | b, c                                    |
| Indoor sporting<br>events            | 61.8<br>(48.6)                          | 55.0<br>(49.8)                            | 44.3<br>(49.7)              | a, b, c                                 |
| Indoor<br>shopping malls             | 51.0<br>(50.0)                          | 45.7<br>(49.8)                            | 34.8<br>(47.6)              | a, b, c                                 |
| <i>Individual characteristics</i>    |   |   |                             |   |
| Age                                  | 41.4<br>(13.5)                          | 40.5<br>(14.4)                            | 42.7<br>(14.7)              | a, b, c                                 |
| Male (%)                             | 47.2<br>(49.9)                          | 46.3<br>(49.9)                            | 47.4<br>(49.9)              |   |
| Family income<br>(\$1000), 1992\$    | 27.0<br>(26.5)                          | 24.2<br>(24.8)                            | 24.1<br>(24.6)              | a, c                                    |
| Married (%)                          | 54.4<br>(49.8)                          | 50.3<br>(50.0)                            | 51.4<br>(50.0)              | a, c                                    |
| Previously<br>married (%)            | 28.1<br>(49.8)                          | 27.7<br>(44.8)                            | 31.2<br>(46.3)              | b, c                                    |
| Education                            | 12.6<br>(2.2)                           | 12.2<br>(2.3)                             | 12.1<br>(2.3)               | a, c                                    |
| African-<br>American (%)             | 8.6<br>(28.0)                           | 10.5<br>(30.7)                            | 8.2<br>(24.4)               | a, b, c                                 |
| American<br>Indian (%)               | 1.5<br>(12.2)                           | 1.7<br>(13.0)                             | 1.8<br>(13.1)               | c                                       |
| Asian (%)                            | 1.6<br>(12.5)                           | 1.9<br>(13.7)                             | 1.7<br>(13.1)               |   |
| Hispanic (%)                         | 3.9<br>(19.3)                           | 5.8<br>(23.3)                             | 4.2<br>(20.1)               | a, b, c                                 |
| Employed (%)                         | 68.3<br>(46.6)                          | 64.1<br>(48.0)                            | 64.7<br>(47.8)              | a, c                                    |
| Cigarettes per<br>day                | 18.0<br>(9.6)                           | 19.2<br>(10.6)                            | 20.5<br>(10.8)              | a, b, c                                 |
| N                                    | 46,106                                  | 6,139                                     | 78,017                      |   |

a. Data source: Current Population Survey Tobacco Use Supplements conducted in 1992-93, 1995-96, 1998-99, and 2001-02. Sample is composed of self-respondents who are everyday smokers. Respondents with missing values for preferences for any of the six public areas, with missing information on past quit attempts, quit plans, or cigarettes smoked, or under age 18 are excluded.

Table reports means or proportions with standard deviations in parentheses.

b. Differences in means tested using Bonferroni multiple comparison test. Significant differences in means at the 5% level where

a – compares those who tried to quit and plan to try again to those who plan to attempt to quit for the first time.

b – compares those who plan to attempt to quit for the first time to those who do not plan to attempt to quit.

c – compares those who tried to quit and plan to try again to those who do not plan to attempt to quit.

**Table 3: Preferences for Smoking Bans<sup>a</sup>**

|                                     | (1)                  | (2)                  | (3)                  | (4)                       | (5)                    | (6)                   |
|-------------------------------------|----------------------|----------------------|----------------------|---------------------------|------------------------|-----------------------|
|                                     | Restaurants          | Hospitals            | Indoor work areas    | Bars and cocktail lounges | Indoor sporting events | Indoor shopping malls |
| Age                                 | 0.002**<br>(0.0004)  | -0.017**<br>(0.001)  | -0.001<br>(0.001)    | 0.002**<br>(0.0002)       | 0.001<br>(0.001)       | -0.001<br>(0.001)     |
| Age Squared/1000                    | -0.021**<br>(0.004)  | 0.138**<br>(0.006)   | 0.009<br>(0.006)     | -0.008**<br>(0.003)       | -0.008<br>(0.006)      | 0.005<br>(0.006)      |
| Male                                | 0.032**<br>(0.002)   | 0.031**<br>(0.003)   | -0.073**<br>(0.003)  | 0.006**<br>(0.001)        | -0.067**<br>(0.003)    | -0.016**<br>(0.003)   |
| Family income (1992\$, \$1000)      | -0.078<br>(0.055)    | 0.342**<br>(0.078)   | 0.589**<br>(0.074)   | -0.143**<br>(0.033)       | 0.054<br>(0.078)       | -0.195*<br>(0.078)    |
| Family income missing               | -0.012**<br>(0.004)  | -0.017**<br>(0.006)  | -0.022**<br>(0.006)  | 0.001<br>(0.002)          | -0.045**<br>(0.006)    | -0.046**<br>(0.006)   |
| Married                             | 0.020**<br>(0.003)   | 0.014**<br>(0.005)   | 0.0003<br>(0.004)    | 0.005**<br>(0.002)        | 0.034**<br>(0.005)     | 0.022**<br>(0.004)    |
| Previously married                  | 0.010**<br>(0.003)   | -0.001<br>(0.005)    | -0.012*<br>(0.005)   | -0.00003<br>(0.002)       | 0.008<br>(0.005)       | 0.004<br>(0.005)      |
| Education                           | -0.005**<br>(0.0005) | -0.002**<br>(0.001)  | 0.006**<br>(0.001)   | -0.003**<br>(0.0003)      | 0.0001<br>(0.001)      | -0.010**<br>(0.001)   |
| African American                    | 0.042**<br>(0.004)   | 0.054**<br>(0.005)   | 0.029**<br>(0.005)   | 0.019**<br>(0.003)        | 0.013*<br>(0.006)      | 0.024**<br>(0.006)    |
| American Indian                     | 0.050**<br>(0.009)   | 0.036**<br>(0.011)   | 0.048**<br>(0.011)   | 0.011*<br>(0.005)         | 0.061**<br>(0.011)     | 0.045**<br>(0.011)    |
| Asian                               | 0.077**<br>(0.010)   | 0.116**<br>(0.012)   | 0.118**<br>(0.012)   | 0.053**<br>(0.007)        | 0.060**<br>(0.012)     | 0.063**<br>(0.012)    |
| Hispanic                            | 0.100**<br>(0.006)   | 0.081**<br>(0.007)   | 0.115**<br>(0.008)   | 0.052**<br>(0.004)        | 0.063**<br>(0.007)     | 0.075**<br>(0.008)    |
| Employed                            | -0.007**<br>(0.002)  | 0.023**<br>(0.003)   | 0.054**<br>(0.003)   | -0.004**<br>(0.001)       | 0.013**<br>(0.003)     | 0.018**<br>(0.003)    |
| Cigarettes per day                  | -0.005**<br>(0.0001) | -0.007**<br>(0.0001) | -0.008**<br>(0.0001) | -0.001**<br>(0.0001)      | -0.006**<br>(0.0001)   | -0.007**<br>(0.0002)  |
| Tried to quit, plans to try again   | 0.108**<br>(0.002)   | 0.144**<br>(0.003)   | 0.141**<br>(0.003)   | 0.033**<br>(0.001)        | 0.156**<br>(0.003)     | 0.146**<br>(0.003)    |
| Plans to try to quit for first time | 0.091**<br>(0.006)   | 0.098**<br>(0.006)   | 0.102**<br>(0.007)   | 0.031**<br>(0.004)        | 0.097**<br>(0.007)     | 0.101**<br>(0.007)    |
| 1995-96 survey                      | 0.032**<br>(0.003)   | 0.077**<br>(0.004)   | 0.054**<br>(0.004)   | 0.021**<br>(0.002)        | 0.005<br>(0.004)       | 0.100**<br>(0.004)    |
| 1998-99 survey                      | 0.055**<br>(0.003)   | 0.154**<br>(0.004)   | 0.122**<br>(0.004)   | 0.030**<br>(0.002)        | 0.038**<br>(0.004)     | 0.199**<br>(0.004)    |
| 2001-02 survey                      | 0.097**<br>(0.004)   | 0.234**<br>(0.004)   | 0.229**<br>(0.005)   | 0.035**<br>(0.002)        | 0.104**<br>(0.004)     | 0.288**<br>(0.004)    |

|  |                 |                 |                 |                |                 |                 |
|--|-----------------|-----------------|-----------------|----------------|-----------------|-----------------|
| Log likelihood   | -54146.65       | -79464.99       | -76387.00       | -27793.18      | -84903.01       | -79916.90       |
| Chi squared<br>statistic for quit<br>variables <sup>b</sup><br>[p-value] | 25.00<br>[0.00] | 39.24<br>[0.00] | 37.89<br>[0.00] | 2.96<br>[0.09] | 72.83<br>[0.00] | 47.00<br>[0.00] |

a. Data source: Current Population Survey Tobacco Use Supplements conducted in 1992-93, 1995-96, 1998-99, and 2001-02. Sample is composed of self-respondents who are everyday smokers. Respondents with missing values for preferences for any of the six public areas, with missing information on past quit attempts, quit plans, or cigarettes smoked, or under age 18 are excluded. The number of observations in each equation is 130,262.

Table reports marginal probit coefficients, with standard errors in parentheses. \* (\*\*) indicates coefficient is significantly different from zero at 5% (1%) level, 2-sided tests. The dependent variable equals 1 if the respondent reports that they think smoking should not be allowed at all in that public area, and 0 otherwise. Each equation also includes state indicator variables (coefficients not shown.)

b. Chi squared statistics for test of null hypothesis of equality of effects of “trying to quit, plans to try again” and “plans to try to quit for first time” on support for smoking bans. p-values in parentheses.