

ECONOMIC MODELS OF ADDICTION
AND APPLICATIONS TO SUBSTANCE ABUSE

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Economists and Addiction: Brief History

- Alfred Marshall (1920): "Whether a commodity conforms to the law of diminishing or increasing return, the increase in consumption arising from a fall in price is gradual; and, further, habits which have once grown up around the use of a commodity when its price is low are not quickly abandoned when its price rises again"
- Anticipates the differences between the short-run and long-run price responses that play an important role in economic models of addiction
- Milton Friedman (1962): "Economic theory proceeds largely to take wants as fixed. This is primarily a case of division of labor. The economist has little to say about the formation of wants; that is the province of the psychologist. The economist's task is to trace the consequences of any given set of wants. The legitimacy and justification for this abstraction must rest ultimately, in this case as with any other abstraction, on the light that is shed and the power to predict that is yielded by the abstraction."

Economists and Addiction: Brief History (continued)

- Many characterized addictive consumption as imperfectly rational behavior not conducive to standard economic analysis:
 - Thomas Schelling (1978) describing a smoker who wants to kick the habit: "Everybody behaves like two people, one who wants clean lungs and long life and another who adores tobacco.... The two are in a continual contest for control; the 'straight' one often in command most of the time, but the wayward one needing only to get occasional control to spoil the other's best laid plan."
- Others, however, argued that tools of economics could be appropriately applied to addictive behaviors:
 - George Stigler and Gary Becker (1977): "We assert that this traditional approach of the economist offers guidance in tackling these problems - and that no other approach of remotely comparable generality and power is available."

Insights from Psychology

- Experimental studies of addiction have found reinforcement, acquired tolerance and withdrawal
 - Reinforcement implies a learned response to past consumption; that is, greater past consumption raises the marginal utility of current consumption
 - Acquired Tolerance: a given level of current consumption is less satisfying when past consumption is higher
 - Withdrawal: a negative physical reaction and other reductions in satisfaction as current consumption is terminated

Alternative Approaches to Economic Modeling of the Demand for Addictive Substances

- Conventional Approach:
 - Standard, constrained, lifetime utility-maximizing framework of economics:

$$U(t) = f[C(t), X(t)]$$

$C(t)$ - consumption of addictive substance at time t

$X(t)$ - consumption of composite good at time t

- maximize utility function subject to income constraint
- Produces demand function of the type:

$$C(t) = g[P(t), Y(t), \mathbf{Z}(t)]$$

$P(t)$ - current price of addictive substance

$Y(t)$ - income

$\mathbf{Z}(t)$ - vector of variables reflecting tastes

Alternative Approaches to Economic Modeling of the Demand for Addictive Substances (continued)

- Comments on Conventional Approach:
 - Current consumption of addictive substance depends only on current factors
 - Increase in current price will reduce current consumption (price defined broadly to include monetary price, time costs, expected legal costs, and anticipated health consequences)
 - Increase in past price and/or anticipated increase in future price will have no impact on current consumption
 - Does not reflect the dependence of current consumption decisions on past behavior that characterizes the use of an addictive substance

Alternative Approaches to Economic Modeling of the Demand for Addictive Substances (continued)

- Myopic Models of Addictive Demand (Gorman, Pollak, Houthakker and Taylor, Hammond, Mullahy, and others)
 - Standard, constrained, lifetime utility-maximizing framework of economics:

$$U(t) = f[C(t), C(t-1), X(t)]$$

C(t-1) - consumption of addictive substance
in previous period

- maximize lifetime utility function subject to appropriate income constraint
- Produces demand function of the type:

$$C(t) = g[P(t), C(t-1), Y(t), \mathbf{Z}(t)]$$

Alternative Approaches to Economic Modeling of the Demand for Addictive Substances (continued)

- Comments on Myopic Approach:
 - Current consumption of addictive substance depends on current and past factors
 - Good is defined as addictive if increase in past consumption raises current consumption
 - Increase in current price will reduce current consumption
 - Increase in past price, by reducing past consumption, will also reduce current consumption
 - Anticipated increase in future price will not change current consumption
 - Long-run effect of a permanent price change will exceed short-run effect
 - Does reflect the dependence of current consumption decisions on past behavior that characterizes the use of an addictive substance
 - Ignores the future implications of addictive consumption when making current consumption decisions

Alternative Approaches to Economic Modeling of the Demand for Addictive Substances (continued)

- Rational Models of Addictive Demand
 - Standard, constrained, lifetime utility-maximizing framework of economics:

$$U(t) = f[C(t), C(t-1), X(t)]$$

- maximize lifetime utility function subject to appropriate income constraint
 - Produces demand function of the type:

$$C(t) = g[P(t), C(t-1), C(t+1), Y(t), Z(t)]$$

$C(t+1)$ - future consumption of addictive substance

Alternative Approaches to Economic Modeling of the Demand for Addictive Substances (concluded)

- Comments on Rational Approach:
 - Current consumption of addictive substance depends on current, past, and future factors
 - Good is defined as addictive if increase in past consumption raises current consumption
 - Increase in current, past, or future price will reduce current consumption
 - Long-run effect of a permanent price change will exceed short-run effect
 - Reflects the dependence of current consumption decisions on past behavior that characterizes the use of an addictive substance
 - Implies that the future implications of addictive consumption are considered when making current consumption decisions

Additional Comments on Price Effects

- Long-run effects of permanent price changes are larger than effects of temporary price changes
- Effects of anticipated changes in price are larger than effects of unanticipated price changes
- Ratio of long-run to short-run price effect is greater the greater the degree of addiction
- Long-run price effect greater the larger the rate of time preference for the present

Interactions Between Price and Personal Characteristics

- Hypotheses:
 - Individuals with greater preference for the present (younger, lower income, less educated) will be relatively more sensitive to changes in the monetary price of addictive goods
 - Individuals with greater preference for the future (adults, higher income, more educated) will be relatively more responsive to changes in the perceived future consequences of addictive consumption

Econometric Studies of Addictive Demand: Cigarette Smoking

- Conventional Studies:
 - Large number of diverse studies of cigarette demand using variety of aggregate and individual-level data from US and other countries
 - Consensus estimate for overall price elasticity of demand in the range from -0.3 to -0.5
 - Prevalence elasticity ranges from -0.1 to -0.2

Econometric Studies of Addictive Demand: Cigarette Smoking

- Studies focusing on youth:
 - Economic theory suggests youth will be more sensitive to price (relatively low income, importance of peer influences); similarly, addictive models imply youth will be more price sensitive (more present-oriented, less addicted)
 - Earliest studies by Lewit and his colleagues concluded youth smoking was about three times more sensitive to price than adult smoking
 - Similarly, Lewit, et al., find young adults more sensitive to price than older adults, but not as responsive as youth; conclude that price sensitivity is inversely related to age
 - Subsequent work by Wasserman and his colleagues concluded that price elasticity among youths was not significantly different from that for adults

Econometric Studies of Addictive Demand: Cigarette Smoking

- Recent research by my colleagues and I on youth and young smoking:
 - Data on youth cigarette smoking and other tobacco use from the 1992, 1993, and 1994 Monitoring the Future Surveys of 8th, 10th and 12th grade students
 - Data on young adult cigarette smoking from the 1993 Harvard College Alcohol Survey
 - Measures of state and local cigarette prices, tobacco taxes, restrictions on smoking in public places, limits on youth access to tobacco, and other tobacco related policies added to survey data based on location of respondents
 - Numerous other individual, family, and other determinants of tobacco use controlled for in the econometric models

Econometric Studies of Addictive Demand: Cigarette Smoking

- Results from recent research by my colleagues and I on price sensitivity of youth and young adult smoking:
 - Teens (Chaloupka and Grossman, 1996):
 - Prevalence elasticity: -0.675
 - Conditional demand elasticity: -0.638
 - Unconditional elasticity: -1.313
 - Also find negative impact of smokeless tobacco taxes on both the probability and frequency of smokeless tobacco use among young males (Chaloupka, Tauras, and Grossman, 1997)
 - Find differences in price elasticity by gender (young males more responsive to price than young females) and race (young blacks more sensitive to price than young whites) (Chaloupka and Pacula, 1998)
- Young Adults (Chaloupka and Wechsler, 1997):
 - Prevalence elasticity: -0.53
 - Conditional demand elasticity: -0.58
 - Unconditional elasticity: -1.11

Econometric Studies of Addictive Demand: Cigarette Smoking

- Results from recent research by my colleagues and I on impact of other tobacco related policies on youth and young adult smoking:
 - Strong restrictions on smoking reduce by smoking prevalence and cigarette consumption by young smokers (Chaloupka and Grossman, 1996; Chaloupka and Wechsler, 1997)
 - Limits on youth access have little impact on youth smoking (Chaloupka and Grossman, 1996) unless they are comprehensive, aggressively enforced, and highly complied with (Chaloupka and Pacula, 1998)
 - Anti-smoking campaigns funded by earmarked tobacco taxes reduce both youth smoking prevalence and average cigarette consumption among young smokers (Chaloupka and Grossman, 1996)
- Estimates imply that combination of large cigarette tax increases and comprehensive tobacco control policies directed at youth will lead to substantial reductions in youth smoking

Econometric Studies of Addictive Demand: Cigarette Smoking

- Selected Review of Myopic Demand Studies:
 - Earliest work by Houthakker and Taylor (1966, 1970) using aggregate data for US concludes that tobacco (and alcohol) show strong evidence of addiction (stock of past consumption has significant positive impact on current consumption)
 - Later models based on early work by Farrell (1952) and others estimating "irreversible" demand functions; these imply asymmetric responses to changes in price due to addictive nature of consumption
 - Farrell (1952) finds evidence of addiction for tobacco use based on UK data for 1870-1938
 - Young (1983) uses US data for 1929-1973; finds demand is more responsive to price decreases (elasticity of -0.61) than to price increases (elasticity of -0.30)
 - Similar result found for Finland (Pekurinen, 1989)
 - Mullahy (1985) uses "addictive stock" approach, data from 1979 National Health Interview Survey; obtains strong evidence supporting hypothesis that smoking is addictive; estimated price elasticity of -0.47

Econometric Studies of Addictive Demand: Cigarette Smoking

- Selected Review of Rational Demand Studies:
 - First empirical applications of Becker and Murphy (1988) model of rational addiction by Chaloupka (1988, 1990, 1991, 1992) using data from Second National Health and Nutrition Examination Survey
 - Strong evidence that cigarette smoking is an addictive behavior (significant positive effect of past consumption on current consumption)
 - Strong evidence of rational behavior (significant impact of future consumption on current consumption)
 - Estimated price elasticity in range from -0.27 to -0.48
 - Long-run price elasticity about double short run price elasticity
 - Younger adults behave more myopically than older adults; less educated more myopic than more educated
 - Less educated more responsive to price than more educated (Townsend reaches similar conclusion with respect to difference by income in UK data)
 - Men behave more myopically and are more responsive to price (long-run elasticity centered on -0.6) than women (insignificant price effects)

Econometric Studies of Addictive Demand: Cigarette Smoking

- Selected Review of Rational Demand Studies (continued):
 - Becker, Grossman, and Murphy (1994) use time-series of annual state cross-sections for period from 1955 through 1985
 - Positive and significant past and future consumption effects consistent with rational addiction
 - Long-run price elasticity of -0.75 nearly double the short-run elasticity of -0.40
 - Keeler, et al. (1993) use monthly time-series data for California, 1980 through 1990
 - Similar results to those in two previous studies with short-run elasticity of -0.36 and long-run elasticity of -0.58
 - Douglas (1998) uses retrospective data on smoking initiation and cessation from 1987 NHIS; finds strong evidence of rational addiction; estimates that a 10 percent increase in cigarette prices reduces the duration of cigarette addiction by 10 percent

Econometric Studies of Addictive Demand: Alcohol Use and Abuse

- Conventional Studies:
 - Large economics literature examining the impact of alcohol prices using a variety of aggregated and individual-level data on numerous measures of alcohol use and abuse, including:
 - prevalence of drinking
 - frequency of drinking
 - alcohol consumption
 - prevalence/frequency of binge drinking
 - drinking and driving (self-reported drinking and driving, involvement in non-fatal automobile accidents, motor vehicle accident fatality rates)
 - other accidents (non-fatal and fatal)
 - heavy drinking (liver cirrhosis and other alcohol related death rates)
 - violence (self-reported measures, homicides, suicides, other violent crime rates)

Econometric Studies of Addictive Demand: Alcohol Use and Abuse

- Estimates of Price Elasticity of Alcohol Demand:
 - Large range of estimates, "best guesses" (Leung and Phelps, 1993):
 - Beer: -0.3
 - Wine: -1.0
 - Distilled Spirits: -1.5
 - More recent estimates based on individual-level data suggest price elasticities may be even larger
 - As with cigarette smoking, evidence suggests that youth and young adults will be more responsive to price than adults
 - Mixed evidence of impact of price on drinking by light, moderate, and heavy drinkers:
 - Kenkel (1993) uses data from 1985 NHIS; estimates price elasticity of binge drinking of -0.92 for adults; -2.24 for those under 21
 - Manning, et al. (1995) uses data from 1983 NHIS; estimates price elasticity for moderate drinkers of -1.19; finds that lighter and heavier drinkers are relatively unresponsive to price

Econometric Studies of Addictive Demand: Alcohol Use and Abuse

- Estimates of Impact of Price on Outcomes Related to Alcohol Abuse:
 - Drinking and Driving:
 - Consistent evidence that increases in alcohol prices reduce self-reported drinking and driving; Kenkel (1993), for example, estimates that a 10 percent increase in price reduces probability of drinking and driving by 7.4 percent for males and 8.1 percent for females, with larger effects on underage drinkers
 - Similarly consistent evidence that increases in alcohol prices reduce motor vehicle accident fatalities. Chaloupka, Saffer, and Grossman (1993) estimate an 11.5 percent decline in death rates would have occurred had the federal beer tax been indexed to the rate of inflation since 1951, with 32 percent decline among 18-20 year olds
 - Youth involvement in non-fatal crashes inversely related to beer taxes (Chaloupka and Laixuthai, 1997)

Econometric Studies of Addictive Demand: Alcohol Use and Abuse

- Estimates of Impact of Price on Outcomes Related to Alcohol Abuse:
 - Less extensive literature suggests that higher alcohol prices would reduce injuries and deaths in other accidents (Sloan, Reilly, and Schenzler, 1994; Ohsfeldt and Morrissey, 1997)
 - Several recent studies suggest that increases in alcohol prices would reduce violence related to alcohol use and abuse:
 - Cook and Moore (1993): higher beer taxes would reduce violent crime rates, including assaults and robberies
 - Chaloupka and Saffer (1992): doubling of federal beer tax would reduce homicides by 3 percent, rapes by 2 percent, robberies by 4.7 percent, and total crime by 1.3 percent
 - Markowitz and Grossman: higher beer prices would reduce probability of child abuse (1997) and violence and other problem behaviors on college campuses (1998)

Econometric Studies of Addictive Demand: Alcohol Use and Abuse

- Similar evidence related to other aspects of full price of alcohol use and abuse:
 - Reductions in alcohol availability - including increases in legal drinking ages and reductions in the number of outlets licensed to sell alcohol - lead to reduce alcohol consumption, less drinking and driving, and reductions in other consequences of alcohol use and abuse
 - Increases in expected legal costs of alcohol abuse lead to reduced drinking and related outcomes:
 - Kenkel (1993): Stronger drunk-driving deterrents reduce both the frequency of binge drinking and self-reported drinking and driving
 - Chaloupka, Grossman, and Saffer (1993): policies raising the probabilities of arrest and conviction for DUI as well as the penalties imposed upon conviction reduce motor vehicle accident fatalities related to alcohol use and abuse

Econometric Studies of Addictive Demand: Alcohol Use and Abuse

- Myopic Studies of Alcohol Demand:
 - Relatively few empirical studies of alcohol demand in the context of myopic addictive behavior
 - Earliest work by Houthakker and Taylor (1970) finds strong evidence of habit formation or addiction
 - More recently, Baltagi and Griffin (1995) estimate the demand for distilled spirits using time-series of annual state cross-sections, conclude:
 - Strong evidence of addiction in that past consumption has a strong positive impact on current drinking
 - Long-run price elasticity of demand exceeds short-run price elasticity

Econometric Studies of Addictive Demand: Alcohol Use and Abuse

- Rational Addiction Studies of Alcohol Demand:
 - Earliest work by Cook and Tauchen (1982) uses annual state-level liver cirrhosis death rates for period from 1962 through 1977 as a measure of chronic, long-term heavy alcohol consumption
 - Find that state tax on distilled spirits has a negative and significant impact on liver cirrhosis mortality; estimate that a \$1.00 increase in the tax lowers the death rate by about the same percentage as it lowers per capita consumption of distilled spirits
 - Basic findings confirmed by Chaloupka, et al. (1992) in the context of rational addiction model; estimate long-run price elasticity of cirrhosis deaths of -1.3

Econometric Studies of Addictive Demand: Alcohol Use and Abuse

- Grossman, Chaloupka and Sirtalan (1998)
 - Data on alcohol use taken from panels formed from the annual Monitoring the Future Surveys of high school seniors conducted from 1976 through 1985 (about 2,400 persons in each panel; surveyed every two years)
 - ages 17 through 29
 - key outcome: number of drinks of alcohol consumed in past year; also examined prevalence of heavy drinking and other related measures
 - include price of six-pack of beer, minimum legal drinking ages, and a variety of socioeconomic and demographic determinants of demand

Econometric Studies of Addictive Demand: Alcohol Use and Abuse

- Grossman, Chaloupka and Sirtalan (1998), estimates:
 - Price elasticity of demand from models ignoring addiction: -0.29
 - Positive and significant effects of past drinking on current alcohol consumption evidence of addictive nature of drinking
 - Positive and significant effects of future consumption on current drinking behavior evidence of rational behavior
 - Short-run price elasticity (-0.41) larger in models accounting for addiction than in those ignoring addiction
 - Long-run price elasticity (-0.65) exceeds short-run price elasticity
 - Ratio of long-run to short run elasticities suggests that alcohol use is not as addictive as smoking; consistent with observed drinking patterns

Econometric Studies of Addictive Demand: Alcohol Use and Abuse

- Other Rational Addiction Studies of Alcohol Demand:
 - Moore and Cook (1995) using data from National Longitudinal Survey of Youth estimate both myopic and rational demand functions
 - Positive and significant effects of past and future consumption on current drinking consistent with rational addiction
 - negative and significant price effects; long-run elasticity larger than short-run elasticity
 - Waters and Sloan (1995) using data from 1983 NHIS
 - weak evidence of rational addiction from positive and significant, but small, effects of past and future consumption
 - limited ability to test rational addiction model with the data from NHIS

Econometric Studies of Addictive Demand: Illicit Drug Use

- Conventional Demand Studies:
 - Relatively small literature in economics due to limited availability of reliable data on illicit drug use and prices
 - Early evidence from Nisbet and Vakil (1972) based on self-report prices and use of marijuana by UCLA students estimated price elasticity of demand in range from -0.36 to -1.51
 - Estimates of price elasticity of heroin demand of -0.27 from Silverman and colleagues (Silverman and Spruill, 1977; Brown and Silverman, 1974) using data on property crime rates
 - DiNardo (1993) finds no significant effects of price on probability of cocaine use using cocaine price data from DEA and aggregated measures of prevalence from MTF
 - Bretteville-Jensen and Sutton (1996) study price responsiveness of heroin use in sample of 500 users in Norway; estimate price elasticity of demand of -1.23 for non-dealers (66 percent of sample) and -0.20 for users who are also dealers

Econometric Studies of Addictive Demand: Illicit Drug Use

- Conventional Demand Studies:
 - Saffer and Chaloupka (1997, 1998): Estimate demand for alcohol, marijuana, cocaine, and heroin using data on about 50,000 individuals from combination of 1988, 1990, and 1991 National Household Surveys on Drug Abuse
 - Outcomes: days alcohol consumed in past month and prevalence (past month and past year) of marijuana, cocaine, and heroin use
 - Prices:
 - Alcohol: weighted average price of alcoholic beverages from ACCRA
 - Cocaine and Heroin: price per pure unit based on information from Drug Enforcement Administration's System to Retrieve Information from Drug Evidence (STRIDE) database
 - Marijuana: no measure of money price available, use indicator for individuals residing in states that have decriminalized marijuana use

Econometric Studies of Addictive Demand: Illicit Drug Use

- Saffer and Chaloupka (1997, 1998), continued:
 - Estimates:
 - Alcohol: price elasticity of -0.30
 - Cocaine: elasticities of -0.44 (past year) and -0.28 (past month)
 - Heroin: elasticities of -0.82 (past year) and -0.94 (past month)
 - Marijuana decriminalization raises probability of marijuana use by approximately 8 percent
 - Strong evidence of complementarity among substances, with exception of alcohol and marijuana where estimates are mixed

Econometric Studies of Addictive Demand: Illicit Drug Use

- Conventional demand studies of youth drug use:
 - Chaloupka, Grossman, and Tauras (1998) estimate marijuana and cocaine demand (prevalence and frequency of use) using data from 1982 and 1989 MTF surveys
 - Prices:
 - Cocaine prices comparable to Saffer and Chaloupka measures; also include measures of statutory penalties for cocaine possession
 - Marijuana price measures include indicator of decriminalization and measures of the statutory penalties for marijuana possession
 - Estimates:
 - Cocaine demand sensitive to price: unconditional elasticities of -1.35 (past year) and -1.51 (past month)
 - Mixed evidence that marijuana decriminalization raises prevalence of youth marijuana use
 - Increase sanctions for cocaine or marijuana possession have negative and significant impact, but magnitude of the effects implies that very large increases in penalties would be needed to achieve meaningful reductions in use
 - No evidence that sanctions for sale of cocaine or marijuana have any impact on youth drug use

Econometric Studies of Addictive Demand: Illicit Drug Use

- Myopic demand studies of drug use:
 - van Ours (1995) estimates demand functions for opium in Dutch East Indies (now Indonesia) in time-series of 22 regions for 1922-1938
 - Dutch government monopolized opium market during this period and collected data on consumption, revenues, and number of users
 - Finds strong evidence of addiction, with past opium consumption having positive and significant impact on current consumption
 - Substantial long-run price elasticity of -1.00, about 40 percent larger than short-run elasticity
 - Elasticity of number of opium users with respect to price in range from -0.30 to -0.40

Econometric Studies of Addictive Demand: Illicit Drug Use

- Rational demand studies of drug use:
 - Grossman and Chaloupka (forthcoming) use data from panels formed from 1976 through 1985 MTF surveys of high school seniors (same sample as used for alcohol demand study) to examine cocaine demand among young adults
 - Outcomes include an indicator for individuals who report using cocaine at least once in past year and, for users, the number of occasions in past year on which respondent used cocaine
 - Price measure reflects price of one pure gram of cocaine, constructed from DEA STRIDE database
 - Also include measures of alcohol and marijuana prices (minimum legal drinking age indicator and indicator for marijuana decriminalization)

Econometric Studies of Addictive Demand: Illicit Drug Use

- Grossman and Chaloupka estimates:
 - Positive and significant effects of past participation on current participation; same findings for frequency of use implying that cocaine use is addictive
 - Positive and significant effects of future participation and frequency on current measures; implies that individuals are behaving rationally
 - Negative and significant effects of price in all models
 - Findings consistent across alternative outcomes, specifications, and estimation methods
 - Long-run price elasticity of -1.35; approximately 60 percent larger than short-run price elasticity
 - Some evidence that cocaine and marijuana are complements while cocaine and alcohol are substitutes

Econometric Studies of Addictive Demand: Summary

- Demands for licit and illicit addictive substances are not exceptions to the law of the downward sloping demand curve
 - Significant increases in monetary prices will lead to significant reductions in tobacco, alcohol, and other drug use
- Price responsiveness inversely related to age; that is, youth and young adults are more responsive to changes in price than older adults
 - Given that most substance use is initiated in teenage years, large, sustained increases in price may be the most effective means of achieving substantial long-run reductions in substance use in all segments of the population

Econometric Studies of Addictive Demand: Summary

- Ignoring the addictive nature of demands for tobacco, alcohol, and other drugs will lead to biased estimates of the long-run impact of price on demand
- Because of their addictive nature, long-run reductions in demand resulting from a permanent price increase for tobacco, alcohol, and other drugs will be substantially larger than short-run reductions
- Conversely, because of their addictive nature, temporary price changes will have very little impact on demand
- Demands for addictive substances reflect non-myopic behavior
- Increases in the future price of these substances (i.e. new information on the future health consequences of substance use) will lead to significant reductions in current use

Econometric Studies of Addictive Demand: Summary

- More myopic individuals will be more price sensitive than will more farsighted individuals
- Younger, less educated, and lower income persons will be more responsive to permanent changes in the monetary prices of addictive substances than will older, more educated and higher income persons
- More farsighted individuals will be more responsive to changes in the perceived future consequences of substance use and abuse
- Increases in other aspects of the full price of substance use and abuse will also lead to reductions in current and future use of tobacco, alcohol, and illicit drugs
 - Reductions in availability (i.e. minimum legal purchase ages, limits on youth access)
 - Increases in the expected legal costs of substance use and abuse
 - New information on the short and long term health consequences of substance use and abuse