



Self-control, future orientation, smoking, and the impact of Dutch tobacco control measures



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ABSTRACT

Introduction: The pronounced discrepancy between smokers' intentions to quit and their smoking behavior has led researchers to suggest that many smokers are time inconsistent, have self-control problems, and may benefit from external efforts to constrain their consumption. This study aims to test whether self-control and future orientation predict smoking levels and to identify if these traits modify how cigarette consumption responds to the introduction of tobacco control measures.

Methods: A sample of Dutch adults ($N = 1585$) completed a measure of self-control and the Consideration of Future Consequences Scale (CFCS) in 2001 and indicated their tobacco consumption each year from 2001 to 2007. In 2004, a workplace smoking ban and substantial tax increase on tobacco was introduced in the Netherlands. To identify the potential impact of these tobacco control measures we examined whether participants smoked or were heavy smokers (20+ cigarettes per day) each year from 2001 to 2007.

Results: Participants with high self-control and CFCS scores showed lower rates of smoking across the seven year period of the study. The 2004 smoking restrictions were linked with a subsequent decline in heavy smoking. This decline was moderated by self-control levels. Those with low self-control showed a large reduction in heavy smoking whereas those with high self-control did not. The effects were, however, temporary: many people with low self-control resumed heavy smoking 2–3 years after the introduction of the tobacco restrictions.

Conclusions: The immediate costs which national tobacco control measures impose on smokers may assist smokers with poor self-control in reducing their cigarette consumption.

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1. Introduction

Tobacco use is the largest lifestyle contributor to health conditions globally and there is currently strong support for an accelerated implementation of national tobacco control strategies (Beaglehole et al., 2011; Danaei et al., 2009; Jha & Chaloupka, 1999). A body of research exists detailing how psychological characteristics may affect the prevalence of smoking. Smokers appear to be less future oriented (Adams & Nettle, 2009; Reynolds, Richards, Horn, & Karraker, 2004) and to have lower self-control than others (Daly, Quigley, Egan, & Delaney, under review; Muraven, 2010a). In the current study we examine how these psychological characteristics relate to tobacco consumption and test whether future orientation and self-control produce heterogeneity in how cigarette use responds to large scale tobacco control measures.

1.1. Time perspective, self-control, and smoking

Government health campaigns often promote the long-term benefits of forgoing tempting behaviors (e.g. smoking, alcohol consumption), taking preventative action (e.g. undergoing screening, health regular checks), and investing consistently in protective behaviors (e.g. exercise, healthy diet). Those who are future oriented, as assessed using measures of time perspective (e.g. Strathman, Gleicher, Boninger, & Edwards, 1994), show lower levels of smoking, alcohol consumption, and body mass index than others (Adams & Nettle, 2009; Adams & White, 2009; Beek, Antonides, & Handgraaf, 2013; Delaney, Harmon, & Wall, 2008). Of the many health behaviors, there is a particularly strong rationale for linking time perspective, self-control and tobacco consumption. Smokers are acutely aware of the financial impact of tobacco use and largely recognize the negative health effects of smoking (Hammar & Carlsson, 2005). Furthermore, most smokers wish to quit and try to do so regularly (Lader, 2007).

The strong cessation goals that characterize smokers suggest that their behavior represents a self-control problem: smokers intend to

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smoke less, yet the short-term benefits of smoking (e.g. pleasurable experience, avoidance of withdrawal symptoms) undermine this long-term goal (Adams, 2009). Self-control is conceptually related to time perspective, but empirical studies have shown only modest relations between widely used measures of both concepts (e.g. Adams & Nettle, 2009; Daly, Delaney, & Harmon, 2009). Like those with a low level of future orientation, those with poor self-control are prone to smoking (Daly, Baumeister, Delaney, & MacLachlan, 2014; Daly et al., in preparation; Moffitt et al., 2011) and training to effectively increase self-control (e.g. Muraven, 2010b; Muraven, Baumeister, & Tice, 1999) can assist smokers in reducing their consumption and successfully quitting (Muraven, 2010a; Oaten & Cheng, 2006).

While markedly enhancing self-control is difficult and involves a considerable commitment on the part of the individual, externally imposed restrictions may partially diminish the necessity for self-control and attenuate the impact of low future orientation. Those who are particularly time-sensitive to rewards in the immediate rather than the distant future (Laibson, 1997) may even want restrictions placed upon their behavior in order to act in a way that maximizes long-term rather than immediate benefits. For instance, smokers who want to quit are more supportive of smoking restrictions and tax increases than other smokers (Kan, 2007). There is even evidence that the well-being of those who have a propensity to smoke may improve after taxation is placed on tobacco products (Gruber & Mullainathan, 2005). Similarly, the introduction of a smoking ban appears to increase the well-being of those who have recently failed to give up smoking, suggesting that such bans may assist smokers in following their ideal consumption pattern (Odermatt & Stutzer, 2013).

In these cases, the imposition of a tax creates a restriction on a behavior which has had damaging effects on health and well-being. Restricting smoking and increasing tax on tobacco products places an immediate cost on smoking that could enhance the ability of those with low future orientation and self-control to reduce their smoking levels. In this study, we therefore examine how these psychological characteristics interact with the introduction of stringent tobacco control measures in the Netherlands in 2004.

1.2. Tobacco control measures in the Netherlands

On January 1st 2004 a workplace smoking ban, from which the hospitality industry was exempt, was implemented in the Netherlands. This was followed by a large tax increase of 20% on February 1st 2004. The beneficial health effects of these tobacco control measures have been documented extensively (e.g. de Korte-de Boer et al., 2012; Verdonk-Kleinjan et al., 2009). Nagelhout, Willemsen, and de Vries (2011) used data from 2001 to 2007 drawn from the Dutch Continuous Survey of Smoking Habits (DCSSH) to show an increase in quit attempts and a decrease in the prevalence of smoking in the first half of 2004. Using the DCSSH, Verdonk-Kleinjan, Candel, Knibbe, Willemsen, and de Vries (2011) showed that the workplace ban alone did not produce a decline in smoking levels but the ban coupled with the later 20% tax increase reduced the prevalence of daily smoking and the number of cigarettes smoked per day amongst participants in paid work.

The present study used a sample of Dutch adults to test the hypothesis that individual differences in self-control and considerations of future consequences are associated with the prevalence of smoking and heavy smoking. Furthermore, to gauge how tobacco consumption may be affected by national smoking regulations, we examined the change in smoking levels following the introduction of the 2004 workplace smoking ban and subsequent 20 per cent tax increase in the Netherlands. Finally, we tested whether changes in smoking behavior following these national interventions varied as a function of two personality traits: self-control and future orientation.

2. Method

2.1. Participants and procedure

Data were drawn from the Dutch National Bank Household Panel (DHP), an annual representative survey of the Dutch population aged 16 and over. The DHP data were collected through the CentERpanel, an internet-based survey panel of 2000 Dutch households. To ensure representativeness, a television and telephone line based internet system was provided to all participating households lacking a personal computer with an internet connection. The survey includes eight central modules administered each year (see <http://www.centerdata.nl>), and the sampling methods including details on response rates and sampling bias have been documented extensively (Nyhus, 1996). In total, 1585 participants provided basic demographic details and information on their smoking levels as part of the 2001 survey and the characteristics of the sample are detailed in Table 1. The average age of those who took part in the 2001 survey was 45.17 (SD = 13.67), 44.4% were female, 11.2% had a disability, and the average household size was 2.66 (SD = 1.36).

In order to identify the impact of the psychological characteristics examined on subsequent smoking levels our analyses use personality data from the 'economic and psychological concepts' section of the 2001 survey. Those with available data on relevant covariates who provided self-control data (N = 1060) did not differ from those who did not complete this section, either in terms of demographic or background characteristics. Participants who completed the Consideration of Future Consequences Scale (CFCS) (N = 1218) were likely to be older, have higher income, be retired or disabled and live in lower density areas, providing some evidence of selective completion of this measure.

The current study utilized all waves of data from 2001 to 2007, thus spanning an extensive period prior to and after the introduction of major changes in tobacco control in the Netherlands in early 2004. Approximately 56% of participants with self-control data and 50.5% of those with CFCS data dropped out of the sample between 2001 and 2007, a rate of attrition of 7.2%–8% per annum. An examination of potential attrition bias in the key study variables showed that those who dropped out did not appear to have different levels of self-control

Table 1
Descriptive statistics for main study variables and demographic characteristics in 2001.

Variable	N	Mean/%	SD
<i>Psychological variables</i>			
Self-control	1060	5.20	1.07
Consideration of Future Consequences Scale (CFCS)	1218	44.60	7.29
<i>Health behavior</i>			
Smoker (%)	1585	29.40	
Smoke 20 or more per day (%)	1585	9.78	
<i>Demographic factors</i>			
Age	1585	45.17	13.67
Female (%)	1585	44.35	
Education level completed ^a	1585	5.38	2.53
Income	1585	40,539.46	29,092.12
Employed (%)	1585	62.97	
Unemployed (%)	1585	1.31	
Retired (%)	1585	12.30	
Disabled (%)	1585	11.17	
Other (%)	1585	12.24	
Household size	1585	2.66	1.36
Level of urbanization ^b	1585	2.83	1.32

^a 0 = not yet attending any education; special (low-level) education; other sort of education/training/ apprenticeship, 1 = kindergarten/primary, 2 = continued primary education or elementary secondary education, 3 = continued special (low-level) education, 4 = pre-university education, 5 = junior vocational training, 6 = senior vocational training, 7 = vocational colleges, 8 = vocational colleges 2nd tier, and 9 = university education.

^b From 1 = very high degree of urbanization to 5 = very low degree of urbanization.

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