

# Advancing the Commercial and Public Health Goals of Potentially Reduced-Risk Products through the Assessment of Consumer Satisfaction

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# What goes around...

Sherwood N (1994) Cognitive and psychomotor effects of nicotine and cigarette smoking. In: Ogden MW, Burton HR, Renfro LW (eds) Recent Advances in Tobacco Science 20: 81–105

*“The results of these studies suggest that nicotine has small, specific, positive effects on the central nervous system which may facilitate human attention, memory and sensori-motor function.”*

# Cognitive function

e.g. Sternberg Short-Term Memory Test

Houlihan et al. (2001) Effects of smoking/nicotine on performance and event-related potentials during a short-term memory scanning task.

Psychopharmacology 156: 388-396

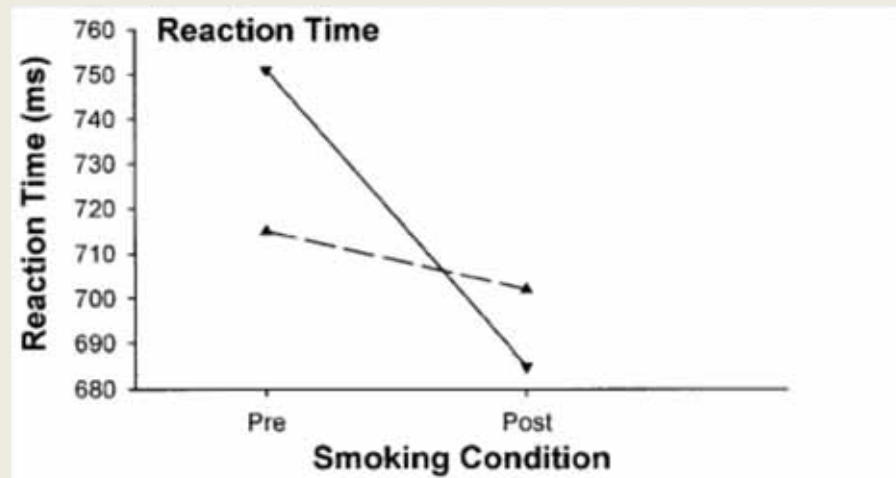
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# Houlihan et al. (2001)



**Fig. 1** Tidal breath carbon monoxide (CO), heart rate (HR), and reaction time (RT) before and after smoking. HR and RT were measured only before and after smoking the experimental cigarettes, CO before and after both the experimental cigarettes and usual brand



# Cognitive function

e.g. Stroop Test of Attentional Flexibility

Mancuso et al. (1999) selective effects of nicotine on attentional processes.  
Psychopharmacology 146: 199-204

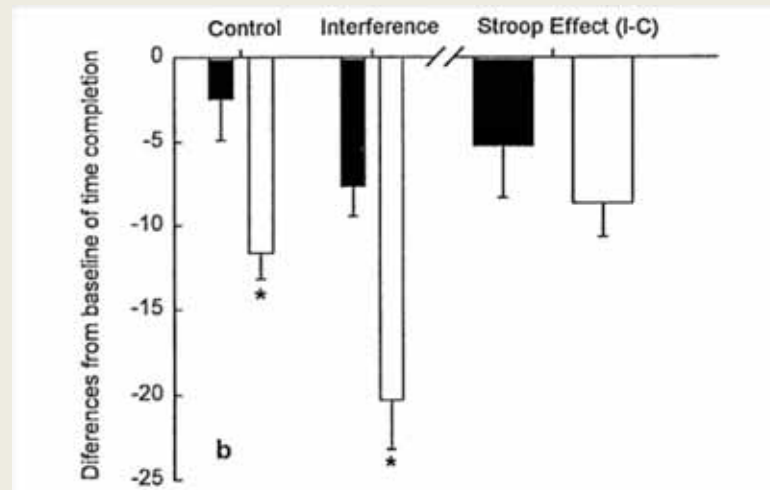
Desk

Blue

Green

War

# Mancuso et al. (1999)



**Fig. 2a, b** The effect of nicotine patches (*clear columns*) and placebo patches (*black columns*) on performance on the Stroop test. **a** Total time completion in the Control Condition (s). **b** Effect of nicotine patch (*clear columns*) and placebo patch (*black columns*) on time to completion (s) for Control Condition and Interference Condition; and on the Stroop effect (Interference minus Control Condition)

# Cognitive function

*“...The significant effects of nicotine on motor abilities, attention and memory likely represent true performance enhancement because they are not confounded by withdrawal relief...”*

Heishman et al. Meta-analysis of the acute effects of nicotine and smoking on human performance. *Psychopharmacology* 210, 453-469, 2010



## The MIND Study

In Partnership with National Institutes of Health (NIH), Alzheimer's Drug Discovery Foundation, Vanderbilt University & University of Southern California

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IS YOUR MEMORY NOT WHAT IT USED TO BE?

You may be eligible for the MIND Study.

[JOIN OUR STUDY >](#)



With funding from the National Institutes of Health (NIH), the MIND (Memory Improvement through Nicotine Dosing) Study is testing whether the safe use of nicotine, delivered in patch form, can improve memory and functioning in people who have been diagnosed with mild memory loss or mild cognitive impairment (MCI).

Some people may be hesitant to join a study involving nicotine, because the risks from smoking are well known.

However, *nicotine does not cause cancer, heart disease, or respiratory illness*. It's the tar and thousands of other chemicals in cigarettes that do.

In fact, researchers have used nicotine in memory studies for more than 30 years. Nicotine is safe when used as prescribed by a physician and may have medicinal benefits.



The MIND Study is by far the largest and longest-running study of its kind, testing whether nicotine can improve memory loss. No tobacco companies are involved in the design, financing, or management of the Study.

866-MIND-150

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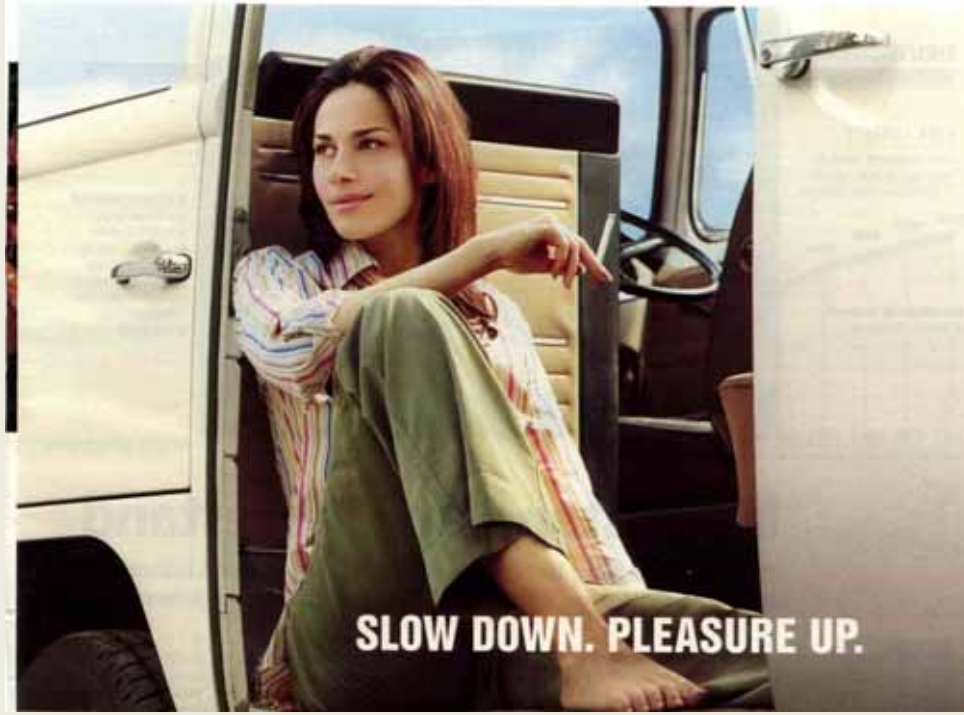


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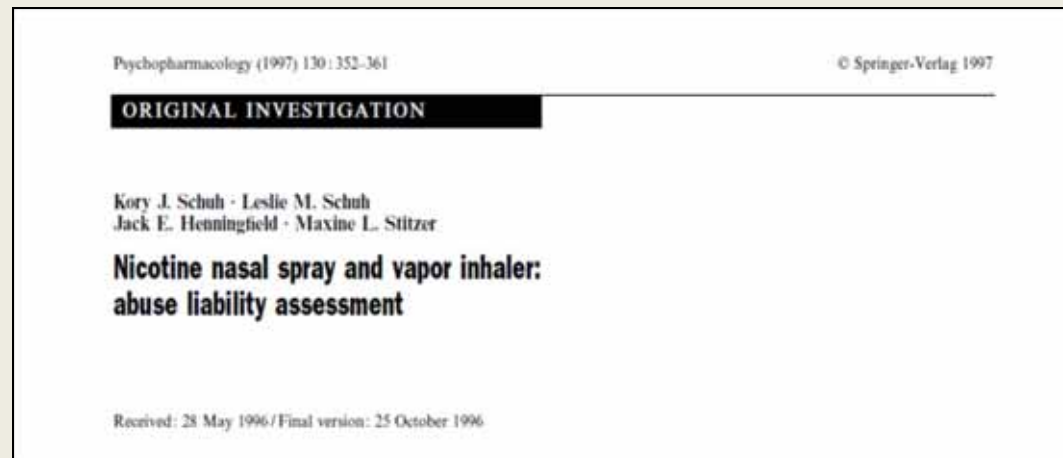
**BAD  
LIKING!**

# Abuse liability - tobacco

- Self-administration (animal studies?)
- Adverse consequences (harm, intoxication, performance impairment)
- Subjective or mood-altering effects...in humans (feeling “high”, liking/enjoyment)

Stitzer and DeWit (1998) Abuse liability of nicotine. In: Benowitz NL (ed.)  
Nicotine safety and toxicity: 119-133

# Abuse liability NNS / vapor inhaler



*“While smokers clearly liked cigarette puffs, there was much less evidence of liking produced by either nasal spray or vapor inhaler; only modest elevations on a measure of good drug effects were observed.”*

# Criteria for a diagnosis of nicotine dependence (DSM-IV / ICD-10)

Strong desire

Difficulties in controlling

Persisting despite harm

Higher priority than alternative activities and obligations

Increased Tolerance

Physiological withdrawal

Unsuccessful quit attempts

# Just how dependant are users?

Percentage of regular users meeting 3+ criteria for substance dependence:

Heroin 23%, Alcohol 15%, Tobacco 32%

(U.S. National Co-morbidity Study 1994)

Tobacco < 50%

(Chen et al. 2000; Hughes et al. 2006 – US smokers)

Tobacco 24%

(Saito 2000 – Japanese smokers)

Caffeine 14%

(Hughes et al. 1993)

# Abuse or use?

*“A number of common characteristics, processes and mechanisms are associated with the habitual use and abuse of substances, including alcohol, tobacco, heroin, other drugs and food”*

Levison PK, Gerstein DR, Maloff DR (1983) In: Levison PK, Gerstein DR, Maloff DR (eds) Commonalities in substance abuse and habitual behaviour: xiii

# Domains for commonalities

## Biochemical / physiological

- Pharmacokinetics
- Receptor function
- Self-administration
  - Tolerance
  - Stimulation

## Psychosocial

- Stress relief
- Social interaction
- Wakefulness
- Concentration
- Enjoyment



**GOOD  
LIKING!**

# Consumer satisfaction

*“...the consumer’s assessment of a product or service in terms of the extent to which that product or service has met his/her needs or expectations.”*

*IPSOS/INRA Consumer Satisfaction Survey (2007). Report to the European Commission.*

# Drugs as instruments

*“Most people who are regular consumers of psychoactive drugs are not drug addicts, nor will they ever become addicts. In neurobiological theories, non-addictive drug consumption is acknowledged only as a “necessary” prerequisite for addiction, but not as a stable and widespread behavior in its own right.”*

Müller CP, Schumann G. Drugs as instruments: a new framework for non-addictive psychoactive drug use. Behavioral and Brain Sciences. 34: 293-347, 2011.

# Non-addictive motives

- Improved social interaction
- Facilitated sexual behaviour
- Improved cognitive performance and countering fatigue
- Facilitated recovery from and coping with psychological stress
- Self-medication for mental problems
- Sensory curiosity – expanded perception horizon
- Euphoria, hedonia, and “high”
- Improved physical appearance and attractiveness

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# Conclusions

- We can consider non-addictive motives as contributing to consumer satisfaction with tobacco and nicotine-containing products, i.e. the reason they are liked
- Little work has been undertaken to see if psychosocial factors influence the use of potentially reduced risk products (RRPs), even though these factors may partially underly the acceptance of RRP among cigarette smokers
- With ever increasing evidence of harm-reduction, RRP are moving into the conceptual space occupied by other consumer products, where consumer satisfaction provides an actionable dimension upon which to optimize product innovation and marketing

# Thank You

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