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Tobacco company strategies to identify and promote the benefits of nicotine

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Abstract

Background—In response to a changing regulatory and consumer landscape, tobacco companies developed new strategies to promote cigarettes and smoking. We examined one of these strategies: to fund and conduct scientific research related to potential benefits of nicotine, and to use their findings to promote nicotine.

Methods—Qualitative analysis of previously secret tobacco industry documents from the Truth (formerly Legacy) Tobacco Documents Library (industrydocuments.library.ucsf.edu/tobacco), triangulated with data from other sources, including the online search engine Google, from the 1970s to December 2017.

Results—After publication of the 1988 Surgeon General’s report on nicotine addiction, tobacco companies (particularly RJ Reynolds) intensified efforts to promote the benefits of nicotine while downplaying its addictiveness and health risks. Activities included building relationships with academic institutions and funding scientific studies of the benefits of nicotine on cognition and other performance areas through intramural and extramural programmes. Companies then promoted their research findings through public relations campaigns, often minimising nicotine’s health risks by comparing it to caffeine or coffee. These comparisons appeared in highly publicised scientific meetings and interviews with the press. Nicotine-positive messages reappeared in the popular press and on some company websites in the 2010s.

Conclusions—Tobacco companies implemented strategies to promote benefits of nicotine to scientific and general audiences while minimising its health risks. These strategies reappeared at

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the time novel tobacco products like electronic cigarettes were introduced. A greater awareness of the source of claims related to purported benefits of nicotine could inform discussions about emerging tobacco products.

INTRODUCTION

Tobacco companies have understood since the 1960s that nicotine is the addictive drug in tobacco, and they used this knowledge to design their products to maximise their addictive potential.¹² By the 1970s, they also recognised how the pharmacological properties of nicotine were associated with consumers' perceived benefits of smoking, and the importance of promoting these benefits to the scientific community and to the public.³⁴

By the mid-1980s, scientific evidence suggesting that nicotine may have deleterious health effects was increasing. For example, the 1986 Surgeon General's report 'The Health Consequences of Using Smokeless Tobacco' outlined several potential deleterious effects of nicotine, including contributions to atherosclerotic disease, promotion of thrombosis and increased oxygen demand contributing to ischaemia and myocardial dysfunction.⁵⁶ In addition, the 1988 Surgeon General's report 'The Health Consequences of Smoking: Nicotine Addiction' concluded that the pharmacological and behavioural processes that determine tobacco addiction are similar to those which determine addiction to drugs such as heroin or cocaine,⁷ presenting a major threat to the tobacco industry's efforts to promote smoking and nicotine. In response, tobacco companies intensified their efforts to promote the idea that people smoke because of the positive effects of nicotine rather than because they are addicted to it.⁸ One of the industry's earliest known coordinated activities was to form 'Associates for Research in the Science of Enjoyment' (ARISE), a group of social scientists, physiologists and philosophers who promoted throughout the 1990s that smoking and nicotine are beneficial while downplaying the harms. Under the leadership of David Warburton, Director of the Human Pharmacology Group at the University of Reading in the UK, ARISE used publications, scientific meetings and popular press to promote the idea that nicotine improved attention and memory and increased work achievement,⁸⁹ and frequently compared smoking with socially acceptable behaviours such as consuming chocolate and coffee.⁹

In 2006, a US district court ruled that the major US tobacco companies and their trade and research organisations violated the Racketeer Influenced and Corrupt Organizations (RICO) statute. The court permanently prohibited the companies from misrepresenting or suppressing information related to cigarettes,¹⁰ making it difficult for companies to continue to promote smoking and nicotine in ways that could be traced back to company employees.

Beginning in 2005, the multinational tobacco companies renewed their efforts to sell non-cigarette nicotine delivery systems such as snus and electronic cigarettes.¹¹⁻¹³ Concurrently, messages have appeared in the popular press (newspaper and magazine articles, books) asserting that nicotine has health benefits such as improved concentration and memory, relaxation, alertness and use as a treatment for neurological disorders.¹⁴⁻²¹ Some of these articles combine nicotine and caffeine content,¹⁴¹⁶ but information on the harmful effects of

nicotine exposure, especially during vulnerable periods of development (during fetal development and adolescence),²² rarely appears.

The current paper describes tobacco company strategies to promote nicotine through research and public relations efforts beyond ARISE, and how these strategies evolved over time. Because documents from RJ Reynolds (RJR) tobacco company provide an especially detailed account of the company strategies, we focused mainly on RJR.

METHODS

We searched internal tobacco industry document electronic archives systematically using the Truth (formerly Legacy) Tobacco Document Library, an archive of over 14 million previously secret tobacco company documents (<http://industry-documents.library.ucsf.edu/tobacco>), between June 2013 and December 2017.^{23,24} Initial keyword searches combined terms related to 'nicotine', 'coffee', 'caffeine', 'chocolate' and 'ARISE'. Thousands of documents were reviewed to discern the themes and context, and to prepare a chronology of activities and alliances. Summary memoranda and proposed additional search terms based on related information (key individuals, organisations, third parties, meeting dates and locations) were circulated among all authors. Snowball searches were used to find related documents using consecutive reference (Bates or sequence) numbers and metadata.²⁴ Additional questions were resolved by triangulating information identified in PubMed and Google to validate and contextualise industry activities. We repeated iterative searches until we reached saturation of keywords and documents.

RESULTS

RJR scientific programmes on benefits of nicotine

By 1989, after the 1988 Surgeon General's report on nicotine addiction was published, RJR's research and development (R&D), marketing, and marketing research departments had formed the Intracompany Nicotine Review Committee (INRC) to provide guidance on 'consumer wants and company needs related to nicotine'.^{25,26} INRC research areas included 'Psychophysiology of Smoking' (led by John H. Robinson, RJR's principal scientist and section head of Psychophysiology), which covered effects of tobacco use on consumers' personality traits, emotions, stress, short-term activity levels and lifestyle factors,²⁷ 'Neurophysiology of Smoking', which covered effects of nicotine on the central nervous system²⁸ and 'Nicotine Receptor Pharmacology', which covered receptor systems of the brain relevant to nicotine.²⁹ The INRC was intended to help RJR scientists 'gain credibility for RJR and gain access to leading scientists, active in nicotine research, throughout the world'.²⁹ RJR scientists believed that they could demonstrate beneficial effects of nicotine through research to counter the current addiction definitions and improve the public's perception of nicotine and smoking.³⁰ A 1991 INRC R&D draft report described the benefits of nicotine research for RJR:

If the Company is to argue that people smoke, not because they are addicted to nicotine, but because they enjoy the benefits they feel they receive from smoking, data must be gathered that describe what these benefits are and how they are

achieved. To this end, studies on human smoking behavior, the physiological, toxicological, and pharmacological effects of nicotine and the effects of nicotine on the psychological states of smokers are providing details about why people smoke. These studies show that smoking is a complex behavioral process that produces benefits to the smoker that he/she finds enjoyable (eg, stress reduction, enhanced mental performance).³¹

By 1992, RJR's Robinson had developed a detailed strategy for studying and publicising the effects of nicotine, which he outlined in a memo to RJR executive vice president for R&D Carl Ehmann (figure 1).^{32,33} Robinson's summary described several purported benefits of nicotine, including potential delay of neurocognitive disorders like Alzheimer's disease, improvements in cognitive attention and performance of routine tasks and stress reduction.³³ Robinson also noted that RJR's in-house electroencephalogram (EEG) studies had already demonstrated effects of smoking on stress reduction, producing 'logical reasons why people smoke that can be readily understood by laymen,' and that these findings had been published in peer-reviewed journals.³³

RJR actively sought to increase the prominence of their published research. For example, the company had substantial involvement in a special 1992 supplement of the journal, *Psychopharmacology*, devoted to nicotine (figure 2).³⁴ ARISE members or RJR employees wrote 8 of the supplement's 21 papers, including 'Enhancement of continuous performance task reaction time by smoking in non-deprived smokers', 'A comparison of the attentional and consolidation hypotheses for the facilitation of memory by nicotine' and 'Facilitation of memory by post-trial administration of nicotine: evidence for an attentional explanation.' Philip Morris (PM), the Council for Tobacco Research and British American Tobacco (BAT) each funded papers,³⁴ for a total of 12 of 21 papers with industry connections. ARISE's leader David Warburton was a *Psychopharmacology* field editor and wrote the opening editorial for the supplement.³⁵

RJR scientists also studied how smokers perceived benefits from smoking so they could generate basic research to more effectively promote their products. Key strategies included studying performance tasks that the general public could understand, such as simulated driving, and publishing benefits 'loudly' and 'up front'.³⁶ Analogies to caffeine were considered particularly potent because caffeine is 'socially accepted' and it 'might enhance social acceptance of nicotine'. These strategies were reiterated in RJR's 1994 10-year 'vision' report, which also described the company's participation in a 1994 symposium³⁷ entitled 'International Symposium on Nicotine: The Effects of Nicotine on Biological Systems II'. The symposium, held in Montreal, Canada, was funded by the German tobacco industry-linked Verum Foundation, the Council for Tobacco Research, BAT, Japan Tobacco, PM Europe, RJR, and several pharmaceutical companies and academic institutions.³⁸ Adlkofer, a tobacco industry consultant who worked closely with the German Tobacco Institute Verband,³⁹ organised the symposium.⁴⁰ Presentations included 'Psychological Resources from Nicotine' by ARISE's David Warburton, which described psychological benefits from smoking related to nicotine, including improved mood and 'enhanced information processing capacity',⁴¹ as well as presentations by RJR employees that likened

nicotine addiction to oestrogen replacement therapy, television viewing and caffeine consumption.⁴² Meeting proceedings were published in 1995.⁴³

RJR's research programmes to support the benefits of smoking and nicotine included funding for Bowman Gray School of Medicine (BGSM) in the 1990s,⁴⁴ with US\$428 000 budgeted in 1992 (US\$773 000 in 2018 dollars) to develop a human performance laboratory.⁴⁵ RJR's Robinson, who had a non-salaried BGSM faculty appointment, led the programme.⁴⁶⁴⁷ The laboratory studied nicotine and driving performance and how caffeine, nicotine and alcohol-affected workplace performance.⁴⁸ Donald deBethizy, Director of Product Evaluation and Scientific Media Liaison for RJR, said that R&D invested in this work with the expectation that they 'should be able to demonstrate that people can perform these complex but repetitive tasks better while smoking'.⁴⁴ RJR and BGSM collaborators published at least six research papers^{49–54} and a review of the effects of smoking on brain activity using EEG data, published in 1996 in *Drug Development and Research*.⁵⁵ The authors concluded that 'smoking appears to bring the brain to a global optimal state for a given situation in terms of factors such as affect and information processing'.⁵⁵ RJR also funded a Stanford University study of airline pilot performance,⁵⁶ published in 1998 in *Psychopharmacology*, which found that nicotine administration 'improved scores on approach to landing, a task which appears to require sustained attention' in non-smoking pilots.⁵⁷ The effects of chronic or repeated nicotine exposure and withdrawal were not assessed.⁵⁷

During the mid-1990s, RJR's R&D programme initiated the Positive Aspects of Nicotine project to conduct 'Research on the role of nicotine in tobacco use, including effects of smoking/nicotine on mood, performance, attention, learning and memory in smokers, human smoking behaviour, nicotine uptake and smoker satisfaction, and the nicotine 'addiction' issue', using in-house and externally funded research on memory and attention.⁵⁸⁵⁹ The Nicotine team was overseen by RJR's deBethizy, director of product evaluation,^{60–62} who became president of RJR's pharmaceutical company Targacept in 2000.⁶³ Targacept was created in 1997 to discover and develop nicotinic cholinergic therapies to treat diseases like Alzheimer's disease, Parkinson's disease, ulcerative colitis, pain and depression.⁶⁴⁶⁵

RJR also developed an in-house Psychophysiology Laboratory to conduct 'basic research into the effects of smoking/nicotine on brainwave activity, subjective feeling states and cognitive performance'.⁶⁶ Many of the laboratory's studies were done in collaboration with Wake Forest University School of Medicine, and results were presented at scientific meetings and published in book chapters and scientific journals.⁶⁶ Of 31 publications RJR listed from the laboratory between 1992 and 2001,⁶⁶ 14 were original research, and the others were reviews, commentaries, letters to the editor, book chapters or could not be located through on-line searches. Of the 25 publications that were located, 13 included outcomes measured with EEG⁴⁹⁵⁰^{52–55}^{67–73} and only one included non-smoking control groups.⁶⁹ In studies of smokers, participants' baseline assessments were conducted after a period of abstinence, suggesting that the benefits reported by the authors could have been related to relief from withdrawal. In several papers, RJR authors noted that smoking has an 'optimizing effect' on 'the complexity of brain dynamics'.⁵⁵⁶⁷⁶⁸ One paper disputed the Surgeon General's conclusions about the addictive nature of nicotine.⁷⁴

RJR used its scientific research to publicly promote nicotine and to question nicotine addiction

RJR's communication strategy was described in a 1994 R&D presentation on the positive aspects of smoking (figure 3).⁷⁵ RJR wanted to 'help smokers articulate better their reasons for smoking', which included reductions in anxiety, anger and stress, and improvements in concentration, attention, focus and motor performance. The company could promote its messages by identifying and scientifically defining 'positive aspects ('benefits') of smoking/nicotine' and communicating the company's data to 'scientific and medical communities, tobacco industry and employees, consumers, government and the general public'. Main messages also included that smoking may prevent Parkinson's and Alzheimer's diseases.⁷⁵

RJR successfully integrated their nicotine messages into communications with the press. Shortly after publication of the 1992 *Psychopharmacology* supplement on nicotine,³⁴ RJR's Robinson questioned the Surgeon General's description of nicotine addiction in an interview with *USA Today* about the supplement: 'Ask yourself this, would I get on a plane with a pilot who's just taken heroin or marijuana? Yet people get on planes with pilots who smoke and drink coffee.'⁷⁶ In a subsequent 1994 interview with the ABC documentary series, *Day One*, Robinson and deBethizy directly promoted nicotine's performance benefits, using 'common sense' outcomes relevant to the public.

I think common sense tells us that I would rather be on a plane with somebody smoking a cigarette and having a cup of coffee, rather than someone drinking alcohol or any of the drugs of abuse. The cigarette smoking, nicotine has some very mild pharmacology associated with it. It does interact with receptors in the brain. The extent of that interaction is known to some extent, but not very completely. People report this mild relaxation, stress reduction, coping ability to concentrate better, maintain alertness, particularly in boring or what psychologists call overlearn tasks—very simple tasks., [transcript]⁷⁷, [video]⁷⁸

RJR also used the popular press to generate positive coverage of their scientific collaborations with academic institutions. A 1995 Cable News Network (CNN) story based on interviews with Robinson and his BGSM collaborators stated:

Research under way in the new human performance lab is aimed at better understanding nicotine's effects on human performance, especially when combined with caffeine or alcohol. The research shows nicotine from cigarettes can—like caffeine from coffee—boost some reaction times.⁷⁹

There are few RJR documents related to company strategies to promote nicotine after the mid-1990s. RJR scientists did continue to publish papers on the beneficial effects of nicotine on response time and other performance measures until at least 2004.⁸⁰ A 2000 internal RJR email described RJR website content related to nicotine and performance: 'Among nicotine's common effects in humans are increased blood pressure and heart rate, and improvements in concentration and short-term memory.'⁸¹ This material was posted by RJR on their website until at least 2004.⁸²

Coordination with other tobacco companies

RJR sought to engage other companies in promoting the positive benefits of nicotine. In 1994, RJR planned to meet in London with BAT and Rothmans to describe RJR's activities and to encourage coordination across the industry.⁸³⁻⁸⁵ In preparatory materials, RJR argued that promoting the benefits of nicotine would help convince critics that people smoke for the benefits of nicotine and not because they are addicted, which could provide a 'boost for industry image'.⁸⁴ RJR suggested that companies could collaborate through ARISE⁸⁴ (which RJR was already funding⁸⁶), interlaboratory cooperation, joint experiments, sharing data analysis and facilities such as RJR's driving simulator, an industry-sponsored satellite meeting following the Montreal nicotine meeting and public communication of benefits.⁸⁴

The available documents do not indicate whether RJR actually met with or collaborated with BAT or Rothmans, or whether the companies formalised a coordinated strategy to promote nicotine. However, BAT also challenged the assertion that nicotine is addictive by promoting its benefits and by drawing analogies between nicotine and other substances through public relations campaigns. A 1994 report from BAT's 'Smoking Issues Department' (that was formed in 1993 to alert the BAT board to potential threatening 'situations' and to communicate company positions to the media and government⁸⁷⁸⁸ described two programmes, 'addiction' and 'fear of living'.⁸⁹ The goal of addiction was to present evidence to internal and external audiences that smoking cannot be considered addictive, while fear of living aimed 'to ridicule all those supporting the ever increasing bureaucracy that over protects to the point of lunacy'.⁸⁹ Company actions related to these programmes included 'encourage organizations such as ARISE; encourage intellectual debate within the medical profession on the 'fear of living' to write on the subject; identify and encourage personalities who will speak out; identify groups of journalists who would resist 'fear of living'.⁹⁰ A related 1991 BAT glossy brochure⁹¹ called 'Habit or Addiction' stated that 'Nicotine, in contrast [to heroin and cocaine], is not usually reported to induce euphoria, improves performance and concentration and has been reported to induce either stimulatory or depressant effects on mood depending on a person's circumstances' while claiming that addictive behaviours included eating chocolate and watching soap operas.⁹²

Federal court orders US tobacco companies to stop making deceptive statements about nicotine

In 2006, a US district court ruled that the major US tobacco companies and their trade and research organisations violated the RICO statute by creating an 'illegal enterprise' to defraud the public, including by making deceptive statements about nicotine's addictiveness. The court permanently prohibited the defendants 'from making, or causing to be made in any way, any material false, misleading or deceptive statement or representation, or engaging in any public relations or marketing endeavour that is disseminated to the US public and that misrepresents or suppresses information concerning cigarettes.'¹⁰ It appears that RJR removed direct claims about the benefits of nicotine from the company's website sometime between 2004 and 2006. By 2006, the company website noted that 'R.J. Reynolds's scientists and researchers have greatly advanced the state of scientific knowledge in such areas as tobacco and smoking chemistry, ...the cognitive effects of nicotine and smoking, and tobacco agronomy.'⁹³ Later, although no longer claiming nicotine has cognitive benefits,

RJR's website continued to downplay nicotine's adverse health effects and in 2018 the website stated: 'Nicotine in tobacco products is addictive but is not considered a significant threat to health.'⁹⁴ BAT, which is not subject to the 2006 RICO ruling, continued to publicly promote the benefits of nicotine without noting appropriate cautions about its harmful health effects. In April 2018, BAT's website included a feature titled 'Nicotine Explained' which stated: 'Nicotine has been reported to help both relax and stimulate. At the levels found in cigarette smoke, e-cigarette vapours or the concentrations in nicotine replacement products, nicotine is likely to be no more risky for most people than regularly drinking coffee. Nicotine can have a range of benefits, particularly for mood and concentration.'⁹⁵

DISCUSSION

RJR and other major cigarette companies worked to shift the debate on tobacco from the addictive qualities of nicotine and the adverse health effects of smoking to purported physiological benefits from nicotine, which RJR believed would counter declining cigarette sales and improve the industry's image. RJR sought to accomplish this goal by demonstrating benefits of nicotine matching those reported by smokers through carefully crafted research programmes and promotion of their findings to the scientific community, the other tobacco companies and to the public. Communication strategies promoted messages undermining nicotine's potential health risks by comparing it with caffeine and coffee. RJR did not publicly acknowledge what was known at that time about nicotine's adverse health effects, which included contributions to atherosclerosis and cardiovascular disease,⁹⁶ effects on fetal development,⁹⁷⁻⁹⁹ and cognitive deficits and mood dysregulation related to withdrawal.⁷

Evidence suggests that industry-funded published research on the beneficial effects of nicotine has been biased towards industry-favourable findings. A 1997 review of publications investigating the effects of tobacco and nicotine on cognitive performance found that authors acknowledging tobacco industry funding were much less likely than non-industry-funded authors to report negative effects of nicotine on cognitive performance.¹⁰⁰ Non-industry-funded authors reported both positive and negative findings, while industry-funded authors reported positive findings almost exclusively. Because scientists with ties to the tobacco industry continue to publish work on the benefits of nicotine, and it is important that researchers and journal editors consider industry bias in studies of the health effects of nicotine.

In the 2000s, tobacco companies adjusted their product and marketing strategies to accommodate changes in smokers' demographics and attitudes towards cigarettes. In response to consumers moving away from cigarettes, ageing and becoming more multicultural, RJR expanded its portfolio from cigarettes only in 2004 to include moist snuff in 2006, snus and dissolvables in 2009, nicotine replacement therapy/Zonnic gum in 2012, the electronic cigarette Vuse in 2013 and next generation heat-not-burn products in 2014.¹⁰¹¹⁰² We did not find documents describing company strategies to use purported benefits of nicotine to promote their newer products, perhaps because RJR entered these markets after companies became aware that documents could be made public until 2021).¹⁰³ Nevertheless, nicotine-friendly messages, similar to those promoted by the tobacco industry

in the 1980s and 1990s, continue to appear in popular media in the 2000s and include references to cognitive benefits^{14–20104}; some of these messages can be traced to individuals with industry ties or to industry-funded studies.^{18–20104} For example, in a 2013 article in *The Spectator* (a weekly British magazine) entitled, ‘So it might really be true—nicotine is good for your brain,’¹⁰⁴ the author (from the Ogilvy Group, an advertising firm in the UK whose clients include BAT),¹⁰⁵ quoted a scientist friend: ‘I’m not sure that nicotine shouldn’t be compulsory; it improves cognitive ability, raises IQ, boosts memory function, treats mental illness...rats when given nicotine are much better at navigating mazes.’¹⁰⁴ Scientific organisations with industry connections also continue to produce reports, commentaries, websites and blogs that communicate that nicotine is safe or beneficial. For example, the American Council on Science and Health, which has a history of tobacco industry funding and has supported the industry’s harm reduction agenda,¹⁰⁶¹⁰⁷ published a 2013 report, ‘Nicotine and Health’¹⁰⁸ that acknowledges that nicotine is addictive but suggests that ex-smokers who ‘miss the positive stimulation smoking once gave them, or who have felt out of sorts ever since giving up smoking’ could discuss with their doctors using nicotine to relieve their symptoms, thus encouraging former smokers to return to using nicotine. The report states that nicotine in electronic cigarettes reduces the urge to smoke and improves mood, working memory and prospective memory. Although no conflicts of interest were disclosed, several of the document’s authors and reviewers have connections to the tobacco industry, including funding from Ruyan (an e-cigarette brand), Reynolds American Services Company and Altria Client Services (PM).¹⁰⁸

Industry document research has several limitations. The Truth Library contains over 14 million documents, and our initial search strategy may not have located all relevant documents. To account for this possibility, we continued searching with different related terms until we reached topic saturation within the document set. Further, data triangulation was limited to online archives and searches. Our review of scientific papers funded by RJR and other tobacco companies was limited to those studies identified through our review of tobacco industry documents. A systematic review of all industry-funded publications related to nicotine is beyond the scope of this paper, but such an analysis could provide important information regarding potential industry bias. Finding recent industry strategies related to nicotine was difficult, as companies have made information less accessible over time through classification of certain documents in the Truth Library as ‘restricted’ and other methods.¹⁰⁹

In conclusion, the available tobacco industry documents describe a consistent and long-running effort by tobacco companies and their industry-funded scientific collaborators to promote nicotine while minimising its health risks by comparing it to caffeine and coffee. While efforts within the scientific community have led to increased disclosure of conflicts of interest in scientific studies, individuals with industry ties can still promote nicotine-friendly messages through the popular media. A greater awareness of the source of claims related to the benefits of nicotine could inform discussions in the tobacco control community and could result in a more informed and productive debate about the potential risks and benefits of emerging tobacco products, including e-cigarettes, and how they are perceived by consumers and healthcare providers.

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What this paper adds

- ▶ Tobacco companies historically have used a variety of strategies to promote tobacco and smoking.
- ▶ In the 1980s and 1990s, tobacco companies (particularly RJ Reynolds) promoted benefits of nicotine while downplaying its addictiveness and health risks.
- ▶ RJ Reynolds collaborated with academic institutions and funded scientific studies of the benefits of nicotine on cognition and other performance areas.
- ▶ RJ Reynolds promoted their research findings through public relations campaigns, often minimising nicotine's health risks by comparing it to caffeine and coffee.

Potential Benefits of Nicotine	Activities Addressing Benefit	How Will Data Be Utilized
Potential amelioration/delay of onset for certain neurodegenerative diseases (e.g., Alzheimer's, Parkinson's)	Nicotine analog program exploring new nicotinic compounds. Possible collaboration with JT to explore effects of nicotine/smoking/analogs on neurodegenerative diseases, performance effects of nicotine in AD patients. Collaboration with SIU (Giacobini) using PET comparing onset of AD in smokers vs. non-smokers Collaboration with Mercer to study performance EEG effects of smoking/nicotine in AD patients. Collaboration with Univ. of London (J. Gray) developing animal models of AD to examine effects of nicotine and nicotine analogs. Manuscripts reviewing the literature are prepared and published	Data will address the role nicotine/smoking may play in preventing or delaying the onset of AD, Parkinson's. Potential market for nicotine or analogs as therapeutics. Assessment of route of administration (inhaling, patch, gum, etc.) may show inhalation is critical for these effects. Could demonstrate competitive advantage for Premier type products. Puts risks/benefits of smoking in perspective.
Nicotine/Smoking reported to improve cognitive attention/performance in simple or routine tasks.	In house EEG laboratory studies effects of smoking/nicotine (gum, patch, etc.) on simple tasks (see Vol. 108, <i>Psychopharmacology</i>). Establishing performance laboratory at BGSMD to expand performance testing capabilities (both cognitive and motor performance) permit in-house lab to conduct more product related research.	Data speak directly to risk/benefit issue of smoking. Demonstrate that nicotine is compatible with everyday tasks, actually improving performance in some cases. New performance lab can compare effects of nicotine to abused drugs, demonstrating distinct differences. Speaks directly to nicotine 'addiction' issue.
Nicotine/Smoking reported to reduce anxiety	In-house EEG studies have demonstrated effects compatible with anxiety reduction following smoking. Other studies have demonstrated smokers report reduced tension/anxiety following smoking.	Manuscripts published in peer-reviewed journals. Data can be used to put the risk/benefit issue of smoking in perspective. Demonstrate logical reasons why people choose to smoke that can be readily understood by laymen. May be useful to pharmaceutical development.
Nicotine's role in smoker satisfaction	Extensive smoking behavior tests conducted in support of product development to determine the role of nicotine in smoker satisfaction (e.g. Nicotine response study, Premier/XDU support, XB support, Brands R&D support. PBPK, PBPD modeling to predict physiological effects of nicotine absorbed from smoking, gum, etc.	Data supplied to product developers to help direct product modifications. Basic data reported in manuscripts/ reports. Role of nicotine in smoker satisfaction is critical to development successful XB, XDU type products.

Figure 1.

RJR internal report from Robinson to executive vice president for R&D Ehmann, detailing specific applications for research activities addressing nicotine: potential benefits of nicotine, activities addressing benefit, and how data will be used.³²³³ AD, Alzheimer's disease; RJR, RJ Reynolds; R&D, research and development.

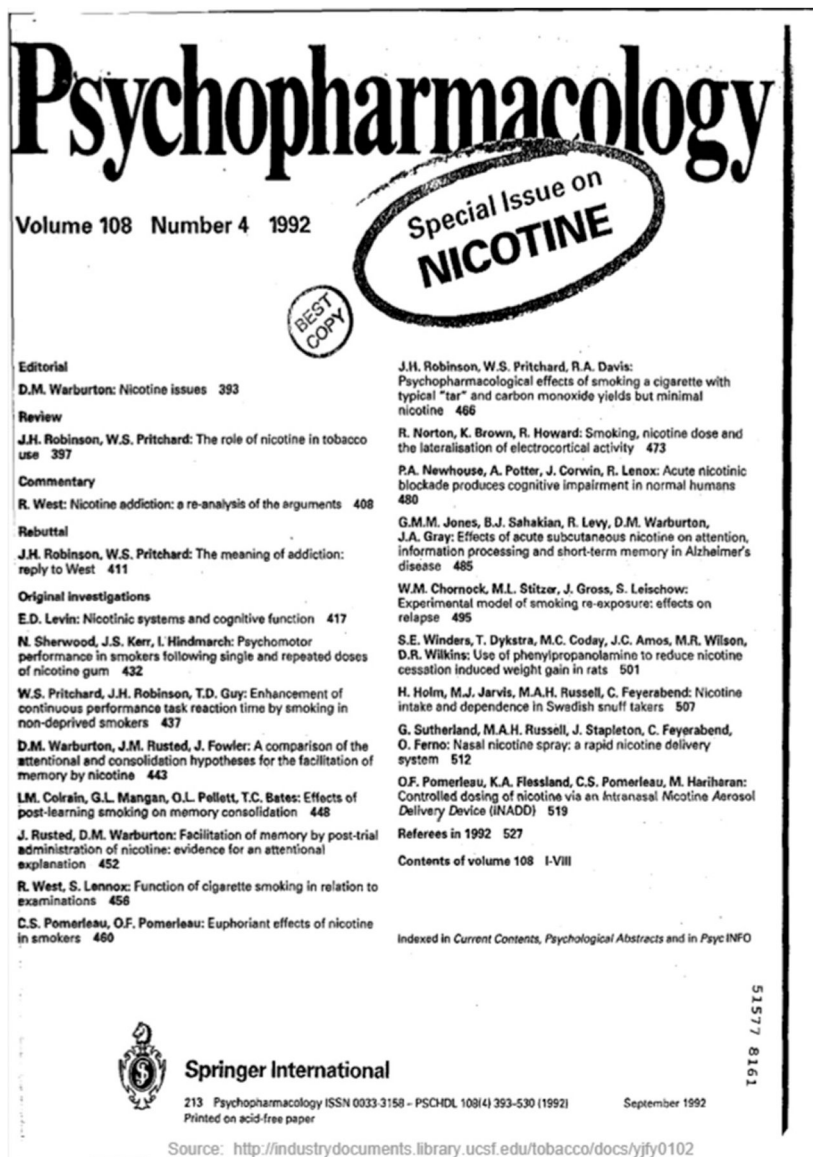


Figure 2. Cover, special issue of *Psychopharmacology* on nicotine (volume 108, number 4, 1992)³⁴ to which ARISE members, RJR scientists and RJR-funded researchers contributed heavily. RJR contributors include Robinson, Pritchard, while Warburton was a member of ARISE. The Council for Tobacco Research funded the study by Levin, Philip Morris funded the study by Colrain, and BAT funded the study of Jones. ARISE, Associates for Research in the Science of Enjoyment; BAT, British American Tobacco; RJR, RJ Reynolds.

Strategy

- Provide Sound Scientific Evidence in Response to “Anti” Claims of Absolutely No Redeeming Value for Tobacco Products
- Differentiate Nicotine and Caffeine from Addicting Drugs

Positive Aspects (“Benefits”) of Smoking

Communicate Our Data to:

- Scientific & Medical Communities
- Tobacco Industry & Employees
- Consumers
- Government
- General Public

Message To Communicate

- Compatible with Everyday Tasks
- Helps People Cope by Reducing Stress and Anger
- Improves Concentration and Performance
- May Play Preventative Role in Alzheimer’s and Parkinson’s

We Have to Do a Better Job of Publicizing these Positive Aspects, to Help Smokers Articulate Why They Smoke



Figure 3. Selected slides from RJR presentation, positive aspects of smoking. From the file of Robinson, research and development.⁷⁵ RJR, RJ Reynolds.