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Ever Users Versus Never Users of a "Less Risky" Cigarette

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The authors surveyed 173 smokers who purchased and 114 smokers who knew about but did not purchase Eclipse—a tobacco industry product that is advertised as a reduced risk cigarette. Most low-tar/nicotine cigarette users who purchased Eclipse believed Eclipse was safer than low-tar/nicotine cigarettes both for their own health (73%) and for the health of others around them (86%). Additionally, many viewed Eclipse as a step toward quitting (53%). The authors did not identify robust predictors of Eclipse use. At 6 months follow-up, Eclipse users were as likely to have tried to quit as nonusers; however, the small sample size does not rule out the possibility that Eclipse use undermines quit attempts. The authors conclude that almost all users believe Eclipse is safer than low-tar cigarettes.

Keywords: harm reduction, smoking, tobacco industry, tobacco use cessation, tobacco use disorder

Potential reduced exposure products (PREPs) are cigarette substitutes designed to reduce toxin exposure relative to traditional cigarettes and thereby reduce the health risks to smokers and nonsmokers (Hatsukami, Henningfield, & Kotlyar, 2004; Institute of Medicine, 2001; Warner, 2003). Eclipse (manufactured by RJ Reynolds [RJR], Winston-Salem, NC) is a PREP that heats rather than burns tobacco and, thus, is expected to produce fewer carcinogens and other toxins (Eclipse Expert Panel, 2000). Although some data suggest Eclipse reduces harm (Eclipse Expert Panel, 2000), the U.S. Institute of Medicine (2001) determined that there is insufficient evidence for this conclusion.

Eclipse advertising states that Eclipse "may present less risk," "may present less risk of cancer," "reduces levels of carcinogenic compounds," and "produces less respiratory inflammation'" (see www.eclipse.rjrt.com). One purpose of the present study is to determine whether smokers believe these claims. Eclipse ads also state, "Here's the next best choice [to quitting]"; thus, another purpose of the study is to determine whether Eclipse is especially attractive to smokers interested in quitting and undermines motivation to quit.

Method

Participants

In April 2000, RJR modified its Eclipse marketing to contain the risk reduction messages stated above in local print ads. This occurred initially in the Dallas/Fort Worth, Texas, area and then in national publications and on an RJR Web site (www.rjrdirect.com). In August 2000, RJR sent Dallas/Fort Worth smokers in its database an advertisement for Eclipse. During this time, Eclipse was not available in any retail outlet but could be obtained only by directly contacting RJR via their Internet site or a toll-free number.

To recruit Eclipse ever users in the Dallas/Fort Worth area, we initially considered using population-based methods or newspaper ads, but the prevalence of use of Eclipse was too small to allow this. Thus, we contacted RJR and asked whether the company would provide us access to its database of smokers who had purchased Eclipse (ever users) and smokers who had been mailed Eclipse advertising but who had never made a purchase (never users). The company agreed to do so. To ensure confidentiality, RJR provided names and addresses to a third party not affiliated with RJR (Excalibur Direct Mail and Marketing Services, Winston-Salem, NC), which then mailed sealed invitations to smokers. The invitations stated,

> The University of Vermont wants to know what you think of Eclipse cigarettes (even if you have not used them). Complete our 15-min phone survey and we will activate the enclosed phone card good for 60 minutes of long distance calls. This survey is sponsored by the National Institutes of Health and is independent of R. J. Reynolds Tobacco Company.

We sent 1,550 invitations to ever users and 3,050 to never users (we thought never users less likely to respond) between October 2000 and February 2001. In total, 286 ever users (17%) and 237 never users (8%) called our recruitment line between November 2000 and March 2001. All participants were 21 years or older. Ever users were eligible for the study if they stated that (a) they had purchased a carton of Eclipse at least once and (b) they were smoking traditional cigarettes on a daily basis at the time of their Eclipse purchase. Never users were eligible if they stated that (a) they had heard of Eclipse cigarettes, (b) they had smoked at least two Eclipse cigarettes, and (c) they currently were smoking traditional cigarettes on a daily basis.

Overall, 173 ever users (60% of ever-user callers) and 114 never users (48% of never-user callers) completed the surveys. Of the 95 noncompleter ever users, 35% refused to participate, 23% could not be reached, 19% were wrong numbers, 17% purchased Eclipse prior to the introduction of explicit safety advertising, and 6% did not qualify. Of the 123 noncompleter never users, 25% refused to participate, 26% could not be reached, 18% were wrong numbers, and 30% did not qualify.

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Protocol

The initial telephone survey assessed demographics, smoking and Eclipse history, and attitudes about Eclipse and low-tar/nicotine (LTN) cigarettes. We also scheduled a second survey to occur 6 months later to provide a preliminary test of the hypothesis that users of Eclipse would be less likely to progress to quitting than never users.

Attitudes about Eclipse were examined only among Eclipse ever users because the proportion of "don't know" responses for Eclipse questions in never users ranged from 26% to 54%, compared with 1% to 25% among ever users. All percentages exclude "don't know" responses from the denominator. Because the study is exploratory in nature, no corrections for multiple tests were used (Perneger, 1998).

Results

Demographics and Smoking Behavior

Compared with nationally representative samples of U.S. smokers in 2000 (Hughes, 2004), our combined sample of never users and ever users was older and more likely to be female and better educated but had a similar number of cigarettes per day (CPD) and age of onset of smoking (see Table 1). The Fagerstrom Test of Nicotine Dependence (FTND) score of our combined sample was similar to U.S. representative data collected in 1990 (Fagerstrom et al., 1996). Our sample had more smokers in the precontemplation stage and fewer in the contemplation stage than were represented in samples of U.S. smokers in 1992–1993 (Wewers, Stillman, Hartmann, & Shopland, 2003). The percentage of smokers who smoked light or ultralight cigarettes was similar to percentages in other samples of U.S. smokers in 2000 (Shiffman, Pillitteri, Burton, Rohay, & Gitchell, 2001).

Table 1
Characteristics of Eclipse Ever Users and Never Users

Variable	Ever users (n = 173)	Never users (n = 114)
Age		
M	51	45
SD	14	12***
Men (%)	35	29
Ethnicity (%)		
White (non-Hispanic)	90	67***
Education (%)		
<12 years education	3	13**
12 years education	28	22
>12 years education	69	65
Nondaily smokers (%)	8	9
Cigarettes per day		
M	22	18
SD	11	11**
Age of onset		
M	18	18
SD	5	6
No. prior quits (*Mdn*)	3	3
Longest quit days (*Mdn*)	45	30
Type of cigarette (%)		
Ultralight	32	27
Light	43	44
Regular	25	29
Switched to lights (%)	69	74
Stage of change (%)		
Preparation	11	16
Contemplation	10	10
Precontemplation	79	75
FTND		
M	4.9	4.1
SD	2.0	2.0**

Note. FTND = Fagerstrom Test of Nicotine Dependence.
** $p < .01$. *** $p < .001$.

Eclipse Use

Among ever users of Eclipse, 4 out of 5 (83%) had stopped using Eclipse by the time of the survey. Including both continuing and past Eclipse users, ever users had smoked a median of six packs of Eclipse for a median duration of 2 weeks by the time of the baseline survey. Eclipse ever users who continued to use Eclipse at baseline reported reducing the number of traditional CPD between starting Eclipse and taking the baseline survey (22 to 16 CPD, $p < .05$), but Eclipse ever users who had stopped Eclipse had not reduced their CPD (22 to 21 CPD).

Beliefs About Eclipse

Over 70% of LTN smokers who used Eclipse believed Eclipse was safer and had less tar and nicotine than their LTN cigarettes (see Table 2). Over half thought Eclipse could help them to reduce or quit smoking, although only about a third thought it satisfied cravings for cigarettes. Attitudes of smokers of regular (non-LTN) cigarettes were similar. The most common single major reason for trying Eclipse was that it produced less smoke (39%, 95% confidence interval [CI] = 31%, 47%), was safer than the smoker's usual brand (15%, 95% CI = 10%, 22%), or would make it easier to quit smoking (15%, 95% CI = 10%, 22%). The most common reasons for stopping Eclipse were that it did not taste good (68%) and did not satisfy cravings (70%).

Distinguishing Between Eclipse Ever Users and Never Users

In a multivariate regression, being older, being a woman, and believing Eclipse causes fewer health problems for persons around smokers predicted ever trying Eclipse ($p < .05$). Other variables, such as interest in quitting, level of dependence, education, and type of cigarette smoked, did not predict use. A receiver operating characteristic analysis found that this regression was poor at predicting Eclipse use, with a sensitivity of 66% and a specificity of 64% at the cut-off point of maximum discrimination (50% by chance).

Follow-Up Results

We were able to contact 125 (72%) ever users of Eclipse and 83 (73%) never users at the 6-month follow-up and examined quit attempts, point prevalence abstinence (Hughes et al., 2003), stage of change (Prochaska, DiClemente, & Norcross, 1992), and intention to quit (Hughes, Keely, Fagerstrom, & Callas, 2005). We assumed that all participants lost to follow-up had made no quit attempts, were still smoking, and had made no forward movement in stage of change or on an intention ladder. At 6 months follow-up, 17% of ever users and 17% of never users had made a 24-hr quit attempt. A multiple logistic regression onto the presence/absence of a quit attempt, adjusted for baseline age, race, sex,

Table 2
Percentage (and 95% CI) of Eclipse Users Endorsing Beliefs About Eclipse

Item	Current light/ ultralight smokers (n = 130)		Current regular smokers (n = 43)	
	%	95% CI	%	95% CI
Produces less second-hand smoke	98	93, 100	95	84, 99
Delivers less tar	90	83, 95	94	81, 99
Delivers less nicotine	88	80, 94	97	85, 100
Causes fewer health problems for nonsmokers around me	86	78, 92	94	81, 99
Safer than my usual brand	73	63, 81	83	66, 93
Can help reduce the number of cigarettes smoked each day	66	57, 74	51	35, 68
Is less addictive	65	54, 74	77	60, 90
Can make it easier to quit smoking completely	53	44, 62	53	36, 69
Satisfies cravings for cigarettes	37	29, 46	33	19, 49
Can be used in places where you cannot normally smoke (restaurants, work, etc.)	17	10, 25	16	6, 31

Note. CI = confidence interval.

education, CPD, FTND, and stage of change, gave an odds ratio (OR) of 1.0; however, the 95% CI for this OR was very wide (0.5, 2.1). At 6 months follow-up, 4 (3%) ever users and 2 (2%) never users were point prevalent abstinent, and the adjusted OR was 0.9 (95% CI = 0.1, 6.2). Similar regressions onto the presence/absence of forward movement in stage of change or on an intention ladder produced adjusted ORs of 1.1 (95% CI = 0.5, 2.6) and 1.3 (95% CI = 0.6, 3.1), again with wide 95% CIs.

Discussion

Over 70% of Eclipse ever users believed Eclipse use produces less tar and nicotine and is safer than LTN cigarettes. These results are similar to qualitative remarks in a recent unpublished survey (Farrelly, Hund, St. Claire, Chou, & Haviland, 2003) and empirical results from recent unpublished (Hamilton, Ouellette, & Rhodes, 2001) and published studies (Shiffman, Pillitteri, Burton, & DiMarino, 2004) of the reactions of non-Eclipse users to Eclipse advertising. These results emphasize the urgency of having a governmental agency decide whether, in fact, the evidence is sufficient to approve Eclipse to continue such advertising.

Although Eclipse ever users and never users differed slightly on several variables, overall, we found few differences in ever users and never users. The prior published study also found that demographics and most smoking variables did not robustly predict self-reported interest in purchasing Eclipse (Shiffman et al., 2004). However, this prior survey did find that intent to purchase was higher in less-dependent and ultralight smokers, whereas we did not find these differences. It is important to note that we did not find that Eclipse use was associated with interest in quitting (i.e., stage of change). The prior study found, contrary to expectations, that intent to purchase in those who planned to quit in the next month was lower, not higher, than in those who planned to quit in the next 6 months (Shiffman et al., 2004).

In our follow-up analyses, Eclipse ever users were not less likely to make a quit attempt, to have quit after 6 months, or to progress in stage of change or intention to quit after trying Eclipse. However, our small sample size (because of the paucity of Eclipse users) does not allow us to rule out the possibility that Eclipse reduced quit attempts by 50% or that it increased them by 100%. In fact, given this uncertainty, we considered not presenting these follow-up results but decided it was best to do so because of the dearth of data on this topic and the fact that deliberately not reporting results contrary to one's hypothesis can be considered unethical.

In the prior published study, the stage of change decreased after non-Eclipse users heard Eclipse advertising (Shiffman et al., 2004). However, in that same study, a similar measure of intention to quit did not change with exposure to Eclipse advertising. In addition, when asked directly, as many smokers said the advertising increased their interest in quitting as said it decreased their interest in quitting.

The current study does not address all the concerns about Eclipse. For example, neither we nor others have examined whether PREP availability would cause former smokers to resume tobacco use or would encourage adolescents who would not have used tobacco otherwise to now use a tobacco product (Institute of Medicine, 2001).

In summary, our results suggest that many smokers believe the reduced risk statements made by PREPs and that PREPs may have appeal for a wide range of smokers. Although our follow-up results suggest that a PREP may not undermine cessation, our sample size was too small to reach any definitive conclusion, and larger studies are needed to resolve this possibility.

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