

Original Investigation

Intermittent smokers who used to smoke daily: A preliminary study on smoking situations

Quyen B. Nguyen & Shu-Hong Zhu

Abstract

Introduction: As many as half of intermittent (i.e., nondaily) smokers once smoked daily. Little is known about their transition from daily to intermittent smoking, a process that eventually leads them to forgo smoking on some days.

Method: The present study attempted to gain insight by analyzing situations in which these individuals were likely to smoke. It used data from a California population tobacco survey with a supplemental questionnaire on smoking situations of young adults (aged 18–29 years, $n=1,581$). The analysis in the present study divided smokers into three groups: daily smokers, intermittent smokers who never smoked daily (never-daily intermittent), and intermittent smokers who formerly smoked daily (former-daily intermittent).

Results: Former-daily intermittent smokers were more similar to never-daily intermittent smokers than to daily smokers in seven types of smoking situation, regardless of whether the situations were more social and episodic, such as “at parties,” or more routine, such as while “driving.” This held true even though these former-daily intermittent smokers were daily smokers only about 22 months on average before the survey. It appears that former-daily intermittent smokers reduce their probability of smoking across all situations.

Discussion: We propose a simple model to explain how a reduction in smoking probability across all situations might lead former-daily intermittent smokers to first forgo smoking on days with no social events. The fact that smokers frequently go from daily to nondaily smoking has both theoretical and practical implications for nicotine research and for public health campaigns to reduce tobacco-related diseases.

Introduction

Intermittent (nondaily) smokers make up a substantial proportion of current smokers in the United States (Evans et al.,

1992; Hassmiller, Warner, Mendez, Levy, & Romano, 2003; Tong, Ong, Vittinghoff, & Pérez-Stable, 2006; Wortley, Husten, Trosclair, Chrismon, & Pederson, 2003; Zhu, Pulvers, Zhuang, & Baezconde-Garbanati, 2007). Intermittent smokers generally smoke too little to maintain a plasma nicotine threshold, given that nicotine has a half-life of about 2 hr and these smokers regularly go a whole day without cigarettes (Benowitz & Henningfield, 1994). Because nicotine is an addictive substance and cigarettes are an accessible commodity, it is puzzling that these smokers do not increase their smoking frequency to a daily basis. In fact, the proportion of intermittent smokers is increasing among the current smoking population in the United States (Centers for Disease Control and Prevention, 2003).

An interesting subgroup of intermittent smokers comprises those who used to smoke daily. These smokers have reduced their smoking days to the point that they now smoke on only about half of the days in any given month (Gilpin, Cavin, & Pierce, 1997). The existence of this group, former-daily intermittent smokers, is supported by multiple longitudinal studies (Etter, 2004; Hennrikus, Jeffery, & Lando, 1996; Zhu, Sun, Hawkins, Pierce, & Cummins, 2003), ruling out the possibility that these are intermittent smokers who misreport their smoking history due to faulty memory. In fact, it has been reported that as many as half of intermittent smokers are former-daily smokers (Gilpin & Pierce, 2002; Hassmiller et al., 2003).

Former-daily intermittent smoking behavior poses theoretical challenges because it suggests that smokers can reduce their cigarette consumption from a level generally considered to indicate nicotine dependence to a nondependent level. This contradicts the classic view of addiction, which includes the continual development of tolerance and loss of control (U.S. Department of Health and Human Services, 1988). Perhaps for this reason, former-daily intermittent smokers have received little attention. However, if the process of change from dependent to nondependent smoking can be better understood, interventions may be developed to facilitate the transition, enhancing the population cessation rate (Hughes & Carpenter, 2006).

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doi: 10.1093/ntr/ntp012

Advance Access publication on February 26, 2009

Received December 10, 2007; accepted April 4, 2008

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This paper is a preliminary study examining the behavior of former-daily intermittent smokers. The main interest is their transition from daily to intermittent smoking, a process that eventually leads them to forgo smoking on some days. A longitudinal follow-up of a representative sample of the smoking population is needed to examine this issue satisfactorily. The present study was exploratory in that it used existing cross-sectional survey data to indirectly infer how the transition might have occurred. The survey assessed various situations in which former-daily intermittent smokers reported being most likely to smoke. By examining the types of situations and by comparing former-daily intermittent smokers' responses to those of daily smokers, we deduced the situations in which former-daily intermittent smokers are most likely to forgo smoking when they go from daily to intermittent smoking. From these results, specific hypotheses can be developed for testing in more comprehensive research in the future.

The present study used data from the 2002 California Tobacco Survey Young Adult Supplement (Gilpin, White, & Berry, 2004). We compared former-daily intermittent smokers' responses to questions on smoking situations with the responses of daily smokers and of another subgroup of intermittent smokers: those who have never smoked daily. For expositional purposes, we labeled this other group of intermittent smokers "never-daily intermittent smokers." Comparing former-daily intermittent smokers to never-daily intermittent smokers as well as to daily smokers provided an additional gauge of the extent to which former-daily intermittent smokers changed when switching from daily to intermittent smoking. Whereas never-daily intermittent smokers never progressed to daily smoking, former-daily intermittent smokers most likely started smoking intermittently, progressed to daily smoking, and then eventually made the transition back to intermittent smoking. The extent to which former-daily intermittent smokers and never-daily intermittent smokers are alike in their current smoking behavior provides additional information for developing hypotheses on how former-daily intermittent smokers change from smoking daily to smoking only on some days.

Method

Data source

The data source for this study was the supplemental survey to the ongoing California Tobacco Survey (Gilpin et al., 2004). This supplement, conducted in 2002, added questions on smoking situations for respondents aged 18–29 years. Interviews were in Spanish or English. There was a screening survey with each contacted household (response rate = 45.7%), and young adults (aged 18–29 years) identified at screening were chosen for extensive interviews (response rate = 58.6%). Detailed information about the survey is available online in California Tobacco Survey technical reports (University of California, San Diego-Social Sciences Data Collection, 2004).

Study sample

In the supplemental survey, 9,455 adults aged 18–29 years were interviewed. Of these, 18.4% were current smokers. To avoid mixing established intermittent smokers with those who smoked intermittently because they were still in the uptake process, this study included only current smokers who had started smoking

at least 3 years prior to the survey (Evans et al., 1992). This yielded a final study sample of 1,581 current smokers aged 18–29 years.

Assessment

Smoking status and smoking history. Current smokers were defined as those who had smoked at least 100 cigarettes in their lifetime and who answered the question, "Do you smoke cigarettes every day, some days or not at all?" with "every day" or "some days." Those who answered "every day" were defined as *daily smokers* and the rest as *intermittent smokers*.

Intermittent smokers were asked, "Have you ever smoked daily for 6 months or more?" They were categorized as *former-daily intermittent* if they answered "yes" and as *never-daily intermittent* if they answered "no." Former-daily intermittent smokers were further asked, "How long has it been since you smoked on a daily basis?" This allowed an estimation of when they transitioned from daily to intermittent smoking.

All smokers were asked, "How old were you when you smoked your first whole cigarette?" Age at initiation and current age were used to estimate how long respondents had smoked.

Smoking situations. Smokers were first introduced to the set of questions on smoking situations: "People smoke in a variety of situations. Please consider each of the following situations and tell me if you smoke cigarettes frequently, sometimes, rarely, or never. If it does not apply to you, say 'not applicable.' Then they were presented with a list of eight situations: "while socializing with friends," "at parties," "at clubs/bars," "while working/studying," "when taking a break at work or school," "in your home or apartment," "outside in public places," and "driving in your car" and asked to choose among the response categories (frequently, sometimes, rarely, never, and not applicable).

Social network smoking. A set of questions dealt with the number of smokers among the respondents' (a) close relatives, (b) close friends, (c) coworkers, and (d) party companions. Response options were "all of them smoke," "most of them smoke," "most of them do not smoke," and "none of them smoke."

Smokers also were asked if they agreed or disagreed with the statement "I only smoke when other people are smoking." In a separate question, smokers were asked about their sources of cigarettes: "Do you generally buy your own cigarettes or get them from others?"

Data analyses

The eight smoking situations appeared to fall into two semantic subgroups. "While socializing with friends," "at parties," and "at clubs/bars" refer to social activities that are episodic for most people. "Driving in your car," "while working/studying," and "in your home or apartment" refer to more routine activities. The situation of "taking a break at work or school" could be both social and routine. The situation "outside in public places" was excluded from the analysis because it was not clear how smokers interpreted "public places." In presenting the data, we arrange the remaining seven situations in the following order: social/episodic situations first, solitary/routine situations next, and "taking a break" last, rather than in the order in which they appeared in the survey.

The response categories for the smoking situations were "frequently," "sometimes," "rarely," "never," and "not applicable."

Intermittent smokers who used to smoke daily

Reasoning that it is probably easiest for smokers to say that they smoke “sometimes” in any given situation, we used the answer “frequently” as an indication of their likelihood of smoking in each situation.

All analyses were separated by sex because smoking prevalence and proportion of intermittent smokers differ by sex (Centers for Disease Control and Prevention, 2005). More important, smoking expectancies also have been reported to differ by sex (Copeland, Brandon, & Quinn, 1995).

All percentages were weighted with population weights, and 95% CIs were estimated using SAS-callable SUDAAN version 9.0.1 with the replicate weight jackknife method (Efron, 1982). Readers are referred to the California Tobacco Survey technical report for detailed sampling and weighting procedures (Gilpin et al., 2004). The data in Tables 2 and 3 are adjusted for age, ethnicity, and educational level, with analyses presented separately by gender.

Results

Sample characteristics

Overall, 39.6% of young adult smokers were intermittent smokers. Among these intermittent smokers, 53.5% were never daily, and 46.5% were former daily.

Table 1 shows the demographics and smoking characteristics of all three groups: daily, never-daily, and former-daily intermittent smokers. Overall, there were more males than females, and about 60% were in the 18–24 age group. About

30% of the sample had attended college part time or full time in the previous year (not shown in table), and both never-daily and former-daily intermittent smokers were more likely than daily smokers to have college degrees. Never-daily intermittent smokers were more likely to be Hispanic.

In terms of smoking history, all three groups had started smoking around age 15, with daily smokers starting slightly younger and having smoked slightly longer than never-daily intermittent smokers. On average, daily smokers smoked 12.6 cigarettes/day. This is a relatively low smoking rate, but it is dramatically higher than that of never-daily intermittent smokers, who averaged only 3.1 cigarettes/day on the days that they smoked.

Former-daily intermittent smokers were the same as daily smokers in terms of age at initiation and number of years smoking. They tended to smoke on more days than did never-daily intermittent smokers in any given month (12.9 vs. 10.3 days). On their smoking days, they also consumed more cigarettes than did never-daily intermittent smokers (4.1 vs. 3.1 cigarettes).

Former-daily intermittent smokers, on average, reported that the last time they smoked daily was 21.6 months before the survey. The older group reported a longer time since daily smoking than did the younger group (29.1 months for ages 25–29 vs. 16.1 months for ages 18–24).

Smoking situations

Table 2 presents seven smoking situations, showing the percentages of young adult smokers who answered “frequently” for each. The top half of the table presents the data for male smokers. We

Table 1. Daily and intermittent smokers: Demographics and smoking characteristics

Characteristics	Daily (<i>n</i> = 959)	Former-daily intermittent (<i>n</i> = 294)	Never-daily intermittent (<i>n</i> = 298)
Sex (%)			
Male	66.2	61.7	70.7
Female	33.8	38.4	29.3
Age (%)			
18–24	61.8	57.0	57.7
25–29	38.2	43.0	42.3
Education level (%)			
Less than high school	22.4	17.7	24.6
High school graduate	34.9	24.5	19.8
Some college	33.4	36.7	34.6
College graduate	9.3 ^a	21.2 ^b	21.1 ^b
Ethnicity (%)			
Non-Hispanic White	54.1	48.6	32.9
Hispanic	24.2 ^a	35.6 ^b	52.5 ^c
African American	5.4	4.1	1.7
Asian American/Pacific Islander	10.6	9.0	8.9
Other	5.8	2.7	4.1
Mean age smoked first whole cigarette (years)	14.5 ^a	14.8 ^a	15.4 ^b
Mean number of years smoked	8.9 ^a	8.9 ^a	8.3 ^b
Mean number of days smoked in past 30 days		12.9 ^a	10.3 ^b
Mean number of cigarettes on smoking days	12.6 ^a	4.1 ^b	3.1 ^c
Mean number of months since smoked daily		21.6	

Note. All estimates are population weighted. For each row, different superscript letters (a, b, and c) indicate that the respective groups differ significantly at the $p < .05$ level. Same superscripts indicate no significant difference.

Table 2. Daily and intermittent smokers: Weighted percentages (95% CIs) who report frequently smoking by specific situations

Situations	Male		
	Daily (<i>n</i> = 540)	Former-daily intermittent (<i>n</i> = 157)	Never-daily intermittent (<i>n</i> = 186)
While socializing with friends	72.5 (67.1–77.4) ^a	42.7 (35.0–50.8) ^b	27.9 (20.9–36.1) ^b
At parties	77.5 (72.2–82.0) ^a	52.6 (44.4–60.7) ^b	35.7 (28.5–43.8) ^c
At clubs/bars	60.2 (54.0–66.1) ^a	45.4 (36.5–54.6) ^b	34.4 (26.5–43.4) ^b
Driving in your car	57.7 (51.9–63.2) ^a	19.7 (13.2–28.2) ^b	12.5 (7.9–19.0) ^b
While working/studying	34.4 (29.8–39.3) ^a	12.7 (7.4–20.8) ^b	7.4 (3.9–13.7) ^b
In your home or apartment	43.3 (37.7–49.2) ^a	11.2 (6.7–18.1) ^b	10.2 (5.2–19.3) ^b
When taking a break at work or school	73.8 (69.2–78.0) ^a	26.4 (18.5–36.2) ^b	8.5 (5.0–14.1) ^c
	Female		
	Daily (<i>n</i> = 412)	Former-daily intermittent (<i>n</i> = 132)	Never-daily intermittent (<i>n</i> = 109)
While socializing with friends	80.0 (75.3–84.1) ^a	51.4 (41.2–61.5) ^b	41.0 (29.6–53.3) ^b
At parties	85.5 (81.2–89.0) ^a	60.4 (50.6–69.5) ^b	51.2 (39.2–63.2) ^b
At clubs/bars	72.5 (67.3–77.2) ^a	54.5 (44.6–64.1) ^b	54.8 (43.7–65.4) ^b
Driving in your car	64.1 (57.7–70.0) ^a	21.9 (14.3–32.2) ^b	16.2 (9.2–27.0) ^b
While working/studying	24.5 (20.2–29.4) ^a	3.2 (1.4–7.2) ^b	3.5 (1.0–11.6) ^b
In your home or apartment	40.1 (34.2–46.4) ^a	9.5 (5.5–16.0) ^b	7.0 (2.5–17.9) ^b
When taking a break at work or school	69.8 (63.5–75.5) ^a	11.7 (7.4–18.0) ^b	12.2 (6.3–22.4) ^b

Note. In each row, different superscript letters (a, b, and c) indicate significant difference at the $p < .05$ level. Same superscripts indicate no significant difference. If smokers answered “not applicable” to any situation, the answer was treated as missing, and proportions were calculated based on the rest of the answers. Rates of answering “not applicable” for each situation: socializing with friends, 1.6%; at parties, 3.9%; at clubs/bars, 11.6%; while driving in your car, 4.9%; while working/studying, 3.8%; at home/apartment, 2.7%; and when taking a break, 2.9%.

first considered male daily and never-daily intermittent smokers (Columns 1 and 3). Not surprisingly, a large percentage of male daily smokers reported frequent smoking in most situations, ranging from “at parties” (77.5%) to “while working/studying” (34.4%). In contrast, male never-daily intermittent smokers were less likely to report frequent smoking across all situations. About one-third reported frequent smoking in social, episodic situations (the first three situations in Column 1), but they were much less likely to report smoking in routine situations, such as driving or studying (around 10%). The most striking contrast involved the situation labeled “when taking a break at work or school.” About three-quarters of daily smokers reported frequent smoking during breaks, but less than 10% of never-daily intermittent smokers did.

The middle column of Table 2 shows the data for former-daily intermittent smokers. They did not differ from never-daily intermittent smokers on two episodic situations: “while socializing” and “at clubs/bars.” However, their percentage falls between that of daily smokers and never-daily intermittent smokers for the other episodic situation, “at parties.” Here former-daily intermittent smokers were more likely to smoke than were never-daily intermittent smokers but less likely than were daily smokers. The same holds true for former-daily intermittent smokers “when taking a break at work or school.” In routine situations such as “driving” and “working/studying,” former-daily and never-daily intermittent smokers were alike: Neither group reported frequent smoking then.

The bottom half of Table 2 shows data for female smokers. The data patterns for female daily and never-daily intermittent smokers were similar to those for males. However, unlike males,

female former-daily intermittent smokers did not differ from female never-daily intermittent smokers in any of the seven smoking situations.

Social network and social smoking

Table 3 shows percentages of smokers who reported that all or most people in their social networks smoked. For males and females, we found no differences among daily, never-daily, and former-daily intermittent smokers regarding coworkers and party companions. However, never-daily and former-daily intermittent smokers were less likely to report that all or most of their close friends or close relatives smoked. We found no significant difference between former-daily and never-daily intermittent smokers.

When presented with the statement “I only smoke when other people are smoking,” 41.4% of never-daily intermittent smokers endorsed it (data not in Table 3), significantly higher than daily smokers’ 13.5% ($p < .01$) but not significantly different from former-daily intermittent smokers (34.7%, $p = .49$). Never-daily and former-daily intermittent smokers also were not significantly different in reporting that they usually get cigarettes from others (40.3% vs. 32.1%, $p = .07$), but both were significantly higher than daily smokers (4.3%, p values $< .01$).

Discussion

This study of young adults shows that in terms of smoking situations, intermittent smokers who once smoked daily were more similar to intermittent smokers who had never smoked daily than to daily smokers. This was true even though these former-daily

Table 3. Daily and intermittent smokers: Weighted percentages (95% CIs) who report that most or all people in their social networks smoke (by social network category)

Social network category	Male		
	Daily (<i>n</i> = 545)	Former-daily intermittent (<i>n</i> = 160)	Never-daily intermittent (<i>n</i> = 188)
Party companions	68.5 (63.8–72.8)	67.3 (58.6–75.0)	60.3 (50.9–68.9)
Coworkers (if applicable)	43.5 (38.7–48.5)	39.2 (30.8–48.3)	34.7 (27.5–42.8)
Close friends	65.2 (59.6–70.4) ^a	50.6 (41.8–59.3) ^b	48.2 (41.1–55.4) ^b
Close relatives	38.3 (34.3–42.6) ^a	21.0 (14.6–29.3) ^b	21.1 (14.9–29.0) ^b
Social network category	Female		
	Daily (<i>n</i> = 414)	Former-daily intermittent (<i>n</i> = 134)	Never-daily intermittent (<i>n</i> = 110)
Party companions	69.0 (62.7–74.6)	59.1 (50.0–67.6)	54.9 (42.7–66.6)
Coworkers (if applicable)	32.5 (27.4–38.1)	21.7 (13.9–32.2)	20.5 (12.6–31.5)
Close friends	65.7 (59.4–71.4) ^a	44.6 (36.4–53.0) ^b	44.8 (34.3–55.7) ^b
Close relatives	44.1 (38.4–50.0) ^a	16.1 (10.6–23.7) ^b	22.4 (13.9–34.2) ^b

Note. In each row, different superscript letters (a, b, and c) indicate significant difference at the *p* < .05 level. Same superscripts indicate no significant difference.

intermittent smokers had been daily smokers themselves only about 22 months previously. The pattern held for both men and women.

These similarities between former-daily and never-daily intermittent smokers were evident despite the differences in ethnicity and in other smoking measures. For example, Hispanic intermittent smokers were more likely than intermittent smokers from other ethnic groups to be never-daily intermittent smokers. Former-daily intermittent smokers tended to smoke more days per month than did never-daily intermittent smokers. On their smoking days, they tended to consume slightly more cigarettes. But despite these differences, former-daily and never-daily intermittent smokers were essentially the same regarding situations when they were most likely to smoke.

The results of the present study agree with previous research showing that many intermittent smokers are former-daily smokers and that the transition from daily to intermittent smoking takes place rather frequently on the population level (Etter, 2004; Hennrikus et al., 1996; Zhu et al., 2003). For example, a longitudinal study of California smokers found that about one-third of people who reported only intermittent smoking at follow-up had been smoking daily at baseline, 20 months earlier. The present study found that, on average, these former-daily intermittent smokers were smoking daily 22 months before the survey. They might have gradually cut out some of their smoking days, or they might have quit entirely and then relapsed to smoking fewer days than before their quit attempt (Zhu et al., 2003). However it happened, the result was a shift from daily smoking to smoking only 13 days a month.

A key question involves the kind of situation (episodic vs. routine) in which former-daily intermittent smokers forgo smoking when they transition from daily to intermittent. As mentioned previously, little research has examined this process. Still, we can make some guesses based on the data pattern seen in Table 2. If we assume that an average smoker has more routine days per month than days with parties and social gatherings, and if we assume that former-daily intermittent smokers

cut their probability of smoking equally across all smoking situations, then the data in Table 2 suggest that former-daily intermittent smokers are most likely to first forgo smoking on days when there are no friends visiting and no parties to attend.

In other words, if we first consider the data on daily and never-daily intermittent smokers, we see that some situations are more likely to lead them to smoke than are others. This holds true for both daily and never-daily intermittent smokers, although the latter are less likely to smoke in any of the seven situations under consideration. Second, if we assume that the smoking patterns of former-daily intermittent smokers before they cut down were more like the smoking patterns of daily smokers, we see that former-daily intermittent smokers as a group do forgo smoking across a broad range of situations, and their likelihood of smoking drops roughly evenly except “when taking a break at work or school.” For daily smokers, the likelihood of frequent smoking in routine situations is lower than in social situations, and it is likely to drop still lower when daily smokers become former-daily intermittent. It may well become so low that if a day involves only routine activities, then former-daily intermittent smokers will not smoke at all on that day. Of course, the reduction of their likelihood to smoke in any given situation may involve more conscious effort than we describe here. This seems especially probable in the case of “taking a break at work or school,” in which former-daily intermittent smokers may consciously try to avoid a routine activity that might involve socializing with smokers. Still, even a model assuming that former-daily intermittent smokers simply reduce their probability of smoking equally across all smoking situations would mean that they, who once smoked daily, would first forgo smoking on days when they had no social activities. With this process ongoing, the number of days that they will forgo smoking will increase (eventually to about half of the month) and will include some days that do have social activities. These are testable hypotheses that merit future research.

Whatever the process by which former-daily intermittent smokers reduce their number of smoking days, Table 2 suggests that former-daily intermittent smokers behave more like

never-daily intermittent smokers in the seven smoking situations studied once they have made the transition. This agrees with a previous study of chippers, very light daily smokers who smoke no more than 5 cigarettes/day. Shiffman, Paty, Kassel, Gnys, and Zettler-Segal (1994) identified both native chippers and converted chippers (i.e., those who had previously smoked more heavily). Even though converted chippers had higher lifetime cigarette consumption and had smoked for a greater number of years, they did not differ from native chippers in terms of their current number of smoking days per week, serum cotinine levels, exhaled carbon monoxide levels, withdrawal symptoms, and time to first cigarette of the day (Shiffman et al., 1994). Taken together, these studies suggest that smoking history will have negligible influence once heavier smokers have made the shift to smoking significantly fewer cigarettes and have maintained the low level of consumption for an extended time.

Another behavior in which former-daily intermittent smokers are more like never-daily intermittent smokers, and less like daily smokers, is their way of obtaining cigarettes. A significant proportion reported that they usually get a cigarette or two from a friend rather than buying their own packs. This would mean that if they experience an urge to smoke in some situations, they might not always have cigarettes readily available (Zhu et al., 2007). The lack of availability would help to keep their smoking frequency low. It is not yet clear, however, whether these former-daily intermittent smokers developed the habit of getting cigarettes from friends before or after transitioning to intermittent smoking.

Another factor making it easier for former-daily intermittent smokers to maintain their lower smoking frequency may be that, compared with daily smokers, they have fewer close friends and relatives who smoke (see Table 3). Having fewer friends and relatives who smoke means former-daily intermittent smokers will encounter fewer and less consistent smoking cues in their social networks and will have fewer opportunities to get cigarettes when they want to smoke. Again, it is unknown if this difference is a preexisting condition, that is, whether former-daily intermittent smokers' friends and relatives were never smokers or quit smoking long ago or whether they quit smoking when former-daily intermittent smokers transitioned from daily to intermittent smoking. It is likely that they influenced each other (Christakis & Fowler, 2008). In any case, the social networks could be a determining factor in daily smokers' transition to, and maintenance of, intermittent smoking. Future research with a longitudinal study design will help to resolve these ambiguities. In either case, the weaker social norm for smoking in former-daily intermittent smokers' immediate social networks and the lower availability of cigarettes would condition former-daily intermittent smokers to have less expectation of smoking as they go about their lives (Berkowitz, 2004; Juliano & Brandon, 1998).

The present study is exploratory and has many limitations. One already mentioned is the use of a cross-sectional survey instead of a longitudinal study design. Another is reliance on smokers' recall, instead of tracking their smoking situations in real time (Shiffman & Paty, 2006). The analysis of the social network effect is crude. Also, the survey did not ask how often smokers are in the seven situations. Instead, the proposed

model of transition assumed that an average smoker has more routine days than days with episodic social events. Finally, this supplemental survey includes only 18- to 29-year-olds, which limits the generalizability of the results to other age groups, since intermittent smoking is more common among young adults (Biener & Albers, 2004; Moran, Wechsler, & Rigotti, 2004).

These limitations notwithstanding, this study provides some testable hypotheses of how daily smokers transition to intermittent smoking and the factors influencing the probability of transition. It demonstrates that the smoking behavior of former-daily intermittent smokers must be incorporated into future theories of smoking because the change from daily to intermittent smoking takes place quite frequently among young smokers.

Funding

National Cancer Institute (CA 23100-22S4) to UCSD Cancer Center.

Declaration of Interests

None declared.

Acknowledgments

The authors thank the two anonymous *Nicotine & Tobacco Research* peer reviewers for their helpful comments on the first version of the manuscript.

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