JOINERS AND NON-JOINERS IN WORKSITE SMOKING TREATMENT: 
PRETREATMENT SMOKING, SMOKING BY SIGNIFICANT OTHERS, 
AND EXPECTATION TO QUIT AS PREDICTORS

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Abstract — Treatment joiners were differentiated from non-joiners when examined across six worksite clinic locations in the Los Angeles area. Predictors examined included preprogram smoking, demographic variables, smoking by significant others, behavioral expectations to quit, and self-efficacy regarding completing treatment and resisting urges to smoke. Non-joiners reported higher preprogram smoking levels and more friends and children who smoked.

Brod and Hall (1984) reported that "smokers who decide not to enter treatment represent a substantial population who have traditionally been ‘lost’ to researchers. More must be learned about how they differ, if at all, from smokers who enter treatment." In comparing joiners with non-joiners, these researchers found that non-joiners were less educated, more anxious, and reported less confidence to resist the urge to smoke in several situations, less confidence that they had the skills required to quit smoking, and less general self-efficacy. Knowledge regarding joiner/non-joiner differences may help suggest strategies to enhance interest in participating in the quitting process. Yet, more needs to be known about joiner/non-joiner differences to develop efficacious strategies to increase the probability that individuals will join smoking cessation treatment.

The purpose of the present investigation was to explore additional predictors to those studied by Brod & Hall. That study apparently did not examine the statistical contribution of preprogram smoking level to joining treatment. Cessation clinic participants who smoke at relatively high levels and have smoked for relatively many years are less likely to succeed in quitting and remaining abstinent after participating in treatment programs (e.g., Hall, Hernig, Jones, Benowitz, & Jacob, 1984; Pomerleau, Adkins, & Pertschuk, 1978; West, Graham, Swanson, & Wilkinson, 1977). Relatively heavy smokers may also be less likely to join cessation treatment programs. Thus, an apparent relation between preprogram self-efficacy and joining could reflect the possibility that relatively heavy smokers are more dependent on nicotine and, as a result, report both lower self-efficacy to be able to complete treatment and are less likely to join treatment programs. The critical test of the

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importance of psychosocial variables as predictors of future behavior is whether they predict future behavior controlling for past behavior.

A second variable examined here was smoking by significant others. This variable may be an important aspect of the support system affecting a smoker's desire and ability to alter his/her smoking behavior (Burton, 1981; Ockene, Nutall, Benfari, Hurwitz, & Ockene, 1981). The smoking environment has been identified as a strong predictor of onset and increases in smoking above and beyond past behavior (e.g., Collins et al., 1987), and has been found to be a predictor of cessation maintenance in women (Coppotelli & Orleans, 1985), although some studies have not found differences between the smoking environments of those who do or do not quit (e.g., Gunn, 1983; also see review in Ockene et al., 1981). It seems probable that a smoker whose significant others are also smokers would be less likely to break group norms by joining a cessation program.

A third variable evaluated here was expectation to quit. Eisinger (1971) and Marlatt and Gordon (1983) found that an item assessing the likelihood that a smoker would quit smoking at a specific time point was an excellent predictor of quitting and relapse. Warshaw and Davis (1985) define this type of variable as a "behavioral expectation," and find that this type of item is a better predictor of various future behaviors (including smoking) than is "behavioral intention" (which expresses a commitment to do or not do a future act). Possibly, one's behavioral expectation of quitting would be a good predictor of whether one would join a clinic in the first place.

We examined through univariate tests whether pretreatment smoking, smoking environment, and behavioral expectation to quit, as well as various self-efficacy and demographic variables, differentiated joiners and non-joiners. In addition, we identified nonredundant "direct" predictors of joining status.

METHOD

Subjects

Eighty-eight subjects (male = 28, female = 60) were recruited from six Los Angeles area worksites. Sixty-one percent were white, 19% were black, 12% were Hispanic, and 8% were Asian. Mean age was 34.8 years (SD = 98), and 75% of the sample was married. Fifty-seven percent of the married subsample had spouses who were smokers and, of the 60% of the married subsample with children, 19% had children who were smokers.

Procedure

Subjects were recruited from clinics held at six different worksites in the Los Angeles area. Worksite supervisors were notified by telephone of a preprogram recruitment meeting, and they were asked to encourage their smoking employees to attend that meeting. The supervisors were told that the recruitment meeting would introduce smokers to a free, state-of-the-art, brief-duration quit smoking program that would be held at the workplace. Further, it was agreed that the preprogram meeting, and the program sessions, would be held during work hours. The workers would be released from worktime with full pay to participate in the program. The supervisors relayed this information to their workers and, according to the supervisors and attendees, at least 90% of all smokers at each of the six worksites attended the preprogram session. The worksites were evenly split between those that employed primarily professionals and those that employed primarily skilled labor. Number of
participants at the preprogram meeting did not differ significantly across worksites. Smokers completed a "preprogram questionnaire" which consisted of a total of 28 responses, were given a copy of the program workbook, were asked to consider personal reasons for smoking and quitting, and were invited to join the first worksite treatment session beginning three days later.

The preprogram questionnaire requested demographic, smoking behavior and history, smoking environment, and psychosocial information. Demographic items included the smoker's age, sex, parental status (i.e., have or don't have children), and ethnic status. Smoking behavior and history items included the number of cigarettes smoked the day before, number of cigarettes usually smoked in one day, number of years smoking, and number and duration of quitting attempts. The smoking environment items included whether the smoker's spouse, children, anyone else they live with, friends, and co-workers smoke cigarettes.

The psychosocial items included the importance for the smoker to stop smoking, likelihood that the smoker would stop smoking on the program's "quit" day (behavioral expectation), likelihood that the program would be able to help the person to stop smoking, likelihood that the person would be able to do the required program tasks (treatment self-efficacy; this item and the one prior to it are similar in conceptual content to Brod & Hall's more comprehensive Quality Possession Scale), how hard the person would try to stop smoking, how easy the person thought it would be to stop smoking (cessation self-efficacy), and, if the person was to stop smoking that day, how difficult it would be to resist the urge to smoke when they: needed energy, something to do with their hands, were relaxed and knew they would enjoy a cigarette, were tense and upset, felt a craving for a cigarette, in those situations where they would smoke without thinking, and were around others who are smoking (a shortened, modified version of the Pre-Treatment Confidence Questionnaire; Conditte & Lichtenstein, 1981).

Clinics began three days after the preprogram session and were conducted once a day for the subsequent six work days. The clinics were free, were conducted at the worksite, and began three days after the orientation session, making entrance requirements much easier than those in the Brod and Hall (1984) study (wherein a $65 deposit was required two weeks prior to the clinic). We wanted to discriminate joiners from non-joiners based on minimal treatment entry requirements in order to place the explanatory burden on the subject's own desire to quit or to not quit smoking. The worksite clinic was a 6-session 15-minute intervention derived from the American Lung Association Manual "Freedom From Smoking in 20 Days." A questionnaire, including smoking self-reports, was administered on the last day of the program.

RESULTS

Thirty subjects did not come to the first face-to-face treatment session or subsequent sessions, whereas 58 people joined the program. Preliminary chi-square analyses indicated that non-joiners did not differ from joiners by sex, ethnic group, marital status, or parental status (all ps > .1). Results were analyzed by first examining univariate joiner/non-joiner differences on each preprogram item. Next, all significantly different preprogram items were entered into a simultaneous logistic regression model. Finally, the relative contributions of only the nonredundant predictors to joining status were examined, and redundancy among the univariate predictors was
Table 1. Means, standard deviations, and significant univariate differences between joiners and non-joiners

<table>
<thead>
<tr>
<th>Item</th>
<th>Joiner Mean and STD</th>
<th>Non-Joiner Mean and STD</th>
<th>Univariate Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preprogram Smoking in cig./day</td>
<td>17.2 (9.1)</td>
<td>26.6 (13.3)</td>
<td>$t = 2.7, p = .009$</td>
</tr>
<tr>
<td>Friends' Smoking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None = 1 to All = 4</td>
<td>2.1 (0.6)</td>
<td>2.4 (0.5)</td>
<td>$t = 2.5, p = .01$</td>
</tr>
<tr>
<td>Child's Smoking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes = 1, No = 2</td>
<td>3 yes, 53 no</td>
<td>7 yes, 21 no</td>
<td>$\chi^2(1) = 6.9, p = .009$</td>
</tr>
<tr>
<td>Hard to resist when others are smoking</td>
<td>62.5 (31.9)</td>
<td>75.2 (24.3)</td>
<td>$t = 1.9, p = .06$</td>
</tr>
<tr>
<td>from 0 to 100%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hard to resist craving for a cigarette</td>
<td>72.5 (29.4)</td>
<td>85.3 (18.0)</td>
<td>$t = -2.5, p = .01$</td>
</tr>
<tr>
<td>from 0 to 100%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How easy to stop smoking</td>
<td>49.8 (27.5)</td>
<td>34.1 (27.5)</td>
<td>$t = 2.5, p = .01$</td>
</tr>
<tr>
<td>from 0 to 100%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will program help you stop from 0 to 100%</td>
<td>66.1 (19.9)</td>
<td>55.0 (24.9)</td>
<td>$t = 2.2, p = .03$</td>
</tr>
<tr>
<td>Will you be able to do all program tasks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>from 0 to 100%</td>
<td>72.9 (21.9)</td>
<td>59.6 (26.8)</td>
<td>$t = 2.9, p = .03$</td>
</tr>
<tr>
<td>Expect to Quit from 0 to 100%</td>
<td>67.5 (19.6)</td>
<td>56.7 (28.7)</td>
<td>$t = 1.8, p = .07$</td>
</tr>
<tr>
<td>How Hard Try to quit from 0 to 100%</td>
<td>87.5 (17.8)</td>
<td>77.9 (22.6)</td>
<td>$t = 2.1, p = .04$</td>
</tr>
</tbody>
</table>

explored to see if it might have been due to relations with preprogram smoking or to some other variable.

Each item was examined separately in the univariate tests of differences between joiners and non-joiners, except for preprogram smoking. The two smoking items were averaged ($r = .92$ between the two items). The univariate results are shown in Table 1. Joiners reported significantly lower preprogram smoking levels, a lesser likelihood of having friends and children who smoked, a greater likelihood of quitting on quit day, a stronger expectation to try hard to stop smoking, greater self-efficacy to be able to stop smoking, higher expectations that the program will help them to stop smoking and that they will be able to do all the tasks that the program requires, and a lesser likelihood of smoking when feeling a craving for a cigarette or when others around them are smoking.

All 10 predictors were entered into a simultaneous logistic regression model (Harrell, 1983). Model chi-square statistics are reported in this model along with effect chi-squares, effect $p$ values, and effect Rs. $R$ equals the percentage of log-likelihood accounted for by the predictors, analogous to the $R$-square in regression models (the larger the $R$, the greater the proportion of the variance accounted for in the dependent variable). Only four predictors showed an $R$ greater than zero (Model $\chi^2(10) = 24.92, p < .006$, model $R = .28$): preprogram smoking, number of friends who smoke, whether or not the children smoke, and likelihood of smoking when others around them are smoking. Examining only these four predictors in the same logistic regression model to examine their relative contributions to accounting for joining status (Model $\chi^2(4) = 22.65, p < .0001, R = .39$), the following effects were obtained: preprogram smoking ($\chi^2(1) = 6.91, p < .009, R = .21, \beta = .80$), friends' smoking ($\chi^2(1) = 5.22, p < .02, R = .17, \beta = .63$), children's smoking ($\chi^2(1) = 3.22$,
The inter-correlation matrix indicated that four of the six redundant predictors were significantly correlated with preprogram smoking ($r$ - at least .21, $p < .05$), whereas the trying hard to not smoke ($r = .12, p > .1$) and expectation to quit on quit day ($r = .10, p > .1$) items were not related to smoking. They were related to the friends' smoking item ($rs = .26$ and .28, respectively; $ps < .01$). Only the children smoking item, from among the three psychosocial nonredundant predictors, was significantly correlated with preprogram smoking (point biserial $r = .25, p < .02$, in the expected direction). Thus, the statistically redundant predictors were accounted for by preprogram smoking or by friends' smoking. Significantly more joiners than non-joiners quit smoking by end of treatment (31% versus 10% of the total sample; $\chi^2(1) = 4.49, p < .05$).

**DISCUSSION**

At least in part, joining treatment seems to be a reflection of one's smoking behavior and social environment. When a potential joiner is a relatively heavy smoker, has friends or children who smoke, and has trouble not smoking when seeing others smoke, this person is less likely to enter a smoking program (at least of the worksite type described in the present study). It is likely that, just as social norms and pressures may lead youths to begin smoking (Flay, 1985), so might social norms and pressures keep potential quitters from joining treatment.

Preprogram smoking was the strongest predictor, suggesting once again that the best predictor of future behavior is past behavior. Furthermore, this finding seems to run contrary to Lichtenstein's (1982) suggestion that the decision to quit is largely a psychosocial matter, although nicotine dependence may affect success of quitting attempts. The present study suggests that the level of one's use of cigarettes throughout the day (which may reflect nicotine dependence) may influence one's self-efficacy about being able to complete treatment and one's initial decision about joining treatment. Years of preprogram smoking did not predict joining or quitting. Perhaps the potential program participants' smoking habits changed during the weeks prior to the program as they independently considered their intentions to quit or not to quit. At minimum, one may conclude that recent social environmental events and related personal smoking behavior are relevant to a person's immediate decisions regarding their current treatment needs, whereas one's behavioral expectations regarding quitting are unrelated to joining a worksite treatment program.

Since the smokers were released from work during work hours with pay to attend brief clinic sessions held at the worksite, it is unlikely that time and duration of the clinics could have affected participation. Still, for at least three reasons, these results must be interpreted with caution. First, both Brod and Hall (1984) and the present study did not use biochemical measures to assess accuracy of self-reported smoking. Of course, one recent study found that while use of a biochemical index appears to exert a motivational effect on quitting, self-report alone is sufficient to accurately describe clinic smoking outcomes (Glynn, Gruder, & Jegerski, 1986). Future studies might consider the effects of use of biochemical validation of self-reports on joining smoking cessation programs. Second, we did not employ exactly the same measures as Brod and Hall (1984). Due to practical limitations of our worksite minimal intervention clinic format, we may have missed some of the breadth captured in their measures. Third, we did not find that spouse or co-worker smoking was related to
joining status. Thus, at least in the present sample, not all aspects of one's smoking environment appear to influence joining status.

Finally, Brod and Hall (1984) found that self-efficacy items were predictive of joining treatment, whereas we found that they were only indirectly related to joining. Maybe self-efficacy is most relevant to entering treatments that are relatively high cost to join. The commitment needed on the part of the subjects was different between ours' and the previous researchers' sites. Brod and Hall's (1984) sample waited two weeks for the clinic to begin and had to provide a $65 deposit. This greater investment in treatment might have made more demands on the smoker to consider carefully whether or not to make a commitment to treatment than our sample, who waited three days for a free, timely clinic at the worksite. On the other hand, it is likely that worksite smoking cessation clinics involve less anonymity than other types of smoking programs. Smokers who join such clinics may join with relatively greater threat of loss of self-esteem if they fail to quit. Thus, as an alternative interpretation of the difference between findings in the two studies, self-efficacy may be relevant to joining treatment where confidentiality is maintained, whereas social environmental variables are more relevant to joining treatment where group pressures are likely to operate. Future research should consider replicating the results of both studies, using all measures from both studies at various clinic sites, and predict joining status after controlling for preprogram smoking level.

REFERENCES
