

Social Support and Smoking Cessation and Maintenance

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This article presents two longitudinal, prospective studies examining the role of social support in smoking cessation and maintenance. Three kinds of support factors were assessed: support from a partner directly related to quitting; perceptions of the availability of general (i.e., nonsmoking) support resources; and the presence of smokers in subjects' social networks. Subjects were smokers in cessation programs. Corroborated smoking status was obtained through 12 months posttreatment. There was evidence for all three support factors, but they operated at different points in the process of cessation and maintenance. High levels of partner support and of the perceived availability of general support were associated with cessation and with short-term (to 3 months posttreatment) maintenance of abstinence. The presence of smokers in subjects' social networks was a hindrance to maintenance and significantly differentiated between relapsers and long-term (12 months) abstainers.

Recent evidence suggests that persons with relatively high levels of social support report fewer psychological and physical symptoms (Cassel, 1976; Cohen & McKay, 1984; Wallston, Alagna, DeVellis, & DeVellis, 1983) and have lower rates of mortality (Berkman & Syme, 1979; House, Robbins, & Metzner, 1982) than those with lower levels of support. One way support may influence physical health is through changes in the performance of health-relevant behaviors, such as decreased cigarette and alcohol use or improved diet and exercise patterns (Cohen & Syme, 1985). Stopping smoking is one of the most difficult, but also one of the most important, health-related changes an individual can make. This article presents two longitudinal, prospective studies designed to examine the possibility that social support can influence smoking cessation and maintenance.

Until now, researchers have simply assumed that supportive social relationships are useful in promoting behavioral changes, but have not explored how support may exert its influences. Social support may be an asset in several ways. First, support in itself may directly influence the behavior. For example, other persons can help an individual to sustain the needed motivation

to achieve and maintain a behavioral change. Second, social influence processes such as modeling of either the desired or undesired (e.g., smoking) behavior could also affect behavior change. Third, social support may play an indirect role by modifying other factors that influence the desired behavior. For example, support may influence cessation and maintenance by helping to create a more manageable and calm interpersonal environment or by helping to alleviate daily hassles, stress, or negative emotions that might overtax individuals' coping abilities and thus predispose them to relapse (Coppotelli & Orleans, 1985).

The proposition that support affects behavior change through its influence on intervening variables argues for the need to assess support resources that are useful in response to a variety of problems and situations, and not those directed specifically at a behavior change. On the other hand, the notion that support promotes behavior change through its direct influence on the desired behavior calls for the need to assess input that is specific to the desired behavior. The present studies include measures of both types of support: one that is specific to quitting smoking and one that taps the perceived availability of a variety of support resources. By examining the relation of each measure to cessation and maintenance, we have the potential to clarify the mechanism through which support influences behavior change.

The majority of studies on support and smoking, however, have looked only at social contacts or membership in a group. In other words, they have measured support in terms of its structure rather than its function. For example, some researchers have examined whether continued therapist or group contact would aid maintenance, but have found these manipulations to be generally ineffective (Bernstein, 1970; Hamilton & Bornstein, 1979; Schmah, Lichtenstein & Harris, 1972). It may not be surprising that many of the studies on support and

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smoking have found only limited relations between their operational definitions of support and maintenance, given that they assessed only contact with a network member and not the meaning of that transaction. Best, Bass, and Owen (1977) have also noted the importance of considering the meaning of transactions. They have suggested that continued contact, rather than being supportive or helpful, may instead foster dependency and undermine the client's sense of self-efficacy, which may be crucial in averting relapse (Condiotte & Lichtenstein, 1980).

A study by Janis and Hoffman (1970) provides some insight into the nature of contacts that result in beneficial outcomes. Janis and Hoffman found that a buddy system in which partners were instructed to call each other daily during treatment improved maintenance as compared to low-contact and control groups. Tape recordings of the discussions between buddies revealed that high-contact partners were more explicit than others in expressing their commitment to live up to the antismoking norm. In addition, they were more likely to give positive social reinforcement when the buddy conformed or to express disapproval when the buddy failed to do so. Thus, high levels of support that were directly related to the target behavior enhanced maintenance.

The above studies have looked only at artificially created support systems. As such, their manipulations tend to be time limited and may not fit well into the client's ongoing daily routine, perhaps explaining why they were not always useful maintenance tools. Consequently, researchers have started to explore the role of support systems that already exist in the smoker's natural environment (i.e., family, friends, coworkers). Ockene, Benfari, Nuttal, Hurwitz, and Ockene (1982), for example, found that successful abstainers had significant others who attended more treatment sessions with them than did those smokers who were unable to quit. Relatedly, Mermelstein, Lichtenstein, and McIntyre (1983) found that successful abstainers experienced significantly more support from a partner than did either smokers who never quit or smokers who quit and relapsed. Coppotelli and Orleans (1985) also found that successful women abstainers had high levels of perceived spouse support, both generally and with regard to quitting smoking. Thus, these studies suggest that support from a smoker's significant others may indeed be an asset to cessation and maintenance. These studies, however, have examined mainly support that is specific to quitting and have not looked separately at general support resources.

Only one study in the literature has looked at the role of general support in smoking cessation. In a retrospective study, Caplan, Cobb, and French (1975) found a main effect for support from a work group, but in an unexpected direction: ex-smokers had the lowest levels of social support compared to either current or nonsmokers. Caplan et al. suggested that the relation between high support and smoking may be attributable to group pressures for smoking and/or to social interactions acting as a stimulus for smoking as a social behavior.

As the Caplan et al. (1975) study suggests, one must consider the possibility that some social contacts, rather than being assets to cessation and maintenance, may actually be hindrances. In particular, the presence of smokers among a quitter's network may influence his or her ability both to quit and to remain abstinent. Although several researchers have found that having sig-

nificant others who smoke is related to increased relapse after quitting (Eisinger, 1971; Graham & Gibson, 1971; Swartz & Dubitsky, 1968; Tongas, 1977; West, Graham, Swanson, & Wilkinson, 1977), others have found that smoking among significant others, such as housemates or spouses, does not matter in initial cessation (Gunn, 1983; Guilford, 1967). This discrepancy in findings between factors that influence cessation and maintenance is not unique (cf. Pomerleau, Adkins, and Pertschuk, 1978) and may indicate that these are two distinct processes.

The present studies go beyond previous work on support and health-related behavior change in several ways. First, they allow for an examination of the process by which support may influence behavior change by assessing both support that is directly related to the desired behavior (i.e., smoking cessation and maintenance) and general support resources. Second, the measure of general support is one that assesses the perceived availability of the supportiveness of others, rather than mere membership in a group or the number of social contacts. Third, the present studies both use a prospective, longitudinal design to examine the role of support in behavior change. Finally, the influence of support on both cessation and maintenance is examined separately.

Method

The data presented in this paper derive from two separate, prospective studies, with the second one designed to be a cross-validation study. The second study started approximately 10 months after the beginning of the first. Both studies used a similar design, which included multiple longitudinal measurements of support and smoking. Smoking status was verified through a combination of biochemical measures (expired air carbon monoxide and saliva thiocyanate) and informant reports.

Subjects

All subjects were smokers participating in cessation programs run by the University of Oregon Smoking Control Program. For both studies, participants were solicited through newspaper, television, and radio advertisements. To qualify for participation in Study 1, subjects had to be either married or living with a partner. Study 2, however, did not have this restriction, and included 28 single smokers. Each subject was required to pay a \$15 fee and a \$25 motivational deposit. The deposit was returned if the subject completed the 6-week program.

The two samples were quite comparable; there were no significant differences between them on any of the demographic or smoking variables. Subjects in Study 1 had a mean age of 38.4 years ($SD = 11.6$), and subjects in Study 2 averaged 38.8 years ($SD = 12.9$). In Study 1, subjects smoked, on average, 25.6 cigarettes a day ($SD = 11.3$) and had smoked for a mean of 20.8 years ($SD = 11.8$), as compared to an average rate of 25.8 ($SD = 12.7$) cigarettes a day and a 20.9 ($SD = 12.7$) year history of smoking for subjects in Study 2. Subjects in both studies smoked cigarettes of moderate nicotine content ($M = .80$ mg, $SD = .44$ in Study 1, and $M = .67$ mg, $SD = .46$ in Study 2). Subjects averaged in both studies slightly over three prior attempts at quitting. Both studies also had an approximately equal distribution of males and females. In Study 1, 27 of the 64 subjects were males, and in Study 2, 32 of the 64 subjects were males.

Procedure

Study 1 Subjects were randomly assigned (within scheduling constraints) to one of two treatment conditions: (a) *spouse training* (ST);

$N = 33$); or (b) *no spouse training* (NST; $N = 31$) There was a total of 10 treatment groups (5 in each condition) spread over a period of 7 months.

Therapists were two advanced graduate students in clinical psychology who had extensive experience in conducting smoking cessation groups. Each therapist had led at least six previous cessation groups and had 2 years experience working with smokers. Partners of subjects in the spouse training condition were required to attend all treatment sessions and received general guidelines for what they could do to help their partners quit smoking. Partners of subjects in the no spouse training condition neither attended the treatment sessions nor received instruction in helping their partners quit. The exception in the latter condition occurred when both members of a couple wanted to quit smoking. In this case, although both attended the no spouse training treatment sessions, they did not receive specific instructions in helping each other quit.

One week prior to the first treatment session, subjects attended an intake meeting with the smoking counselor. At this session the counselor explained the treatment and assessment procedures to the subject (and to the partner in the spouse training groups). Subjects were given an assessment packet to take home and complete by the first treatment session. Included in this packet were the measures of social support and smoking history, as well as forms for self-monitoring baseline smoking rate.

Treatment for both conditions consisted of six weekly, 2-hr long group meetings. The subjects' target "quit date" occurred on the day of the fourth group meeting. Treatment procedures for all groups included self-monitoring of smoking, self-management training, nicotine fading, and a cognitive-behavioral relapse prevention program. As noted earlier, for subjects in the spouse training condition, treatment also included within the sessions advice to partners on helping the smokers quit. At the last group meeting, subjects completed an end-of-treatment assessment packet that included some of the same measures of social support given before treatment. Breath samples for carbon monoxide analysis were also obtained at this point.

Follow-up procedures consisted of phone interviews with the subjects at 1, 2, 3, and 12 months after treatment. Smoking rate (from self-report) was assessed during these interviews. Telephone calls to two significant-other informants of each subject were also made at each follow-up point. At 6 months after treatment the subjects returned to the Smoking Clinic for a group or individual meeting and to complete the full assessment battery once more.

Study 2. Study 2 was identical to Study 1 with one exception: it included a third treatment condition consisting of smokers who were unmarried and not living with a partner. Subjects who were either married or living with a partner were once again randomly assigned (again within scheduling constraints) to either the spouse training condition ($N = 15$) or to the no spouse training condition ($N = 21$). All other subjects ($N = 28$) were assigned to the *singles* treatment group. There was a total of nine treatment groups (three in each condition) spread over a period of 7 months. Therapists were two advanced graduate students in clinical psychology and one senior undergraduate psychology major. None of the therapists in Study 2 was involved in Study 1. Other than the inclusion of the singles control group, the treatment and procedure in Study 2 were essentially the same as Study 1. The format of the singles groups was identical to that of the no spouse training groups.

Measures

A multimethod assessment procedure was used to provide information on social support and smoking outcomes.

Perceived availability of general support. The Interpersonal Support Evaluation List (ISEL; Cohen, Mermelstein, Kamarck, & Hoberman, 1985) consists of 40 statements concerning the perceived availability

of potential social resources. The items were developed on theoretical grounds to cover four separate functions of social support: (a) *appraisal* support, measuring the perceived availability of having someone to talk to about one's problems (10 items); (b) *belonging* support, assessing the perceived availability of people with whom one can do things (10 items); (c) *tangible* support, tapping the perceived availability of material aid (10 items); and (d) *self-esteem* support, measuring the perceived availability of receiving praise from others or of positive social comparisons (10 items). The internal reliability of the ISEL is good ($\alpha = .90$), as is its test-retest reliability over two days ($r = .87$; Cohen et al., 1985). The ISEL was administered at intake, at the end of treatment, and at the 6-month follow-up.

Support for quitting smoking. The Partner Interaction Questionnaire (PIQ; Mermelstein, Lichtenstein & McIntyre, 1983) consists of 61 behaviors related to smoking cessation. Each the items contains a reference to one's partner. The questionnaire contains both positive and negative behaviors, such as "My spouse/partner expressed doubt about my ability to quit or stay quit," and "My spouse/partner rewarded my quitting efforts." Subjects were first asked to judge how often an item occurred during the past week (frequency score). The subjects then evaluated how helpful each item was (perceived helpfulness score) on a 3-point scale. A measure of partner support, *experienced helpfulness*, was derived by taking the sum of the cross-products of the frequency and the perceived helpfulness scores for each item. Subjects completed the PIQ at intake, at the end of treatment, and at the 6-month follow-up. The pretreatment questionnaire was used mainly for treatment planning, so only data from the end-of-treatment and 6-month administrations will be reported. In Study 2, the 28 subjects in the singles groups did not complete this questionnaire.

Social network measures. Included in the "Smoking History Questionnaire" were two questions dealing with the proportion of smokers in the subject's social network. One question asked about the proportion of friends who smoke and the other about the proportion of coworkers who smoke. In each case, subjects were asked to judge on a 5-point scale (from *none* to *all*) how many of their friends or coworkers smoke. Subjects were also asked about the number of current smokers in their household. Subjects answered the network questions only at intake.

Smoking outcomes. Two smoking outcomes, rate (or percentage of baseline smoking rate) and smoking status (abstinent/smoking) were used. Baseline smoking rate and smoking rate during treatment were measured by the subjects' self-monitoring. No data were available on the reliability of their self-monitoring. Smoking rate and status at the end of treatment and during follow-up were determined by a combination of self-report, expired air carbon monoxide and saliva thiocyanate measurements, and significant other reports. On the basis of previous data from the Oregon Smoking Control Program, the cutoff point for carbon monoxide for classifying smokers and nonsmokers was set at 8.0 ppm. This value is consistent with Lando's (1975) finding that ex-smokers produced CO readings between 5 and 11 ppm. The cutoff point for thiocyanate was set at 95 μmm . Benfari, McIntyre, Benfari, Baldwin, and Ockene (1977) determined that this thiocyanate value minimized the cost of mistakes in classifying smokers and nonsmokers. At all assessment points, abstinence was defined as not smoking during the prior week.

Results

In both Study 1 and Study 2, there were no significant differences between the treatment conditions on any of the predictor or outcome variables. The data were therefore collapsed across treatment conditions in each study. More detailed information about treatment outcomes is presented in McIntyre, Lichtenstein, and Mermelstein (1986) and in Lichtenstein, Mermelstein, Kamarck, and Baer (1986).

Relationships Among Support Measures

There were no significant differences between the two studies on any of the predictor variables (the ISEL, PIQ, and Social Network Measures). For the most part, in both studies the three types of measures of support were independent. The correlations between the network questions and the different administrations of the ISEL (perceived availability of general support) and the PIQ (partner support for quitting) were all small and nonsignificant. The same was true for the correlations between the various administrations of the ISEL and the PIQ, with only one exception. In Study 1, the end-of-treatment PIQ was significantly correlated with the end-of-treatment ISEL, $r(64) = .30, p < .05$. Given that this was the only significant correlation out of many between the ISEL and PIQ and that all the other correlations ranged from .07 to .20 between these two measures, one may conclude that the PIQ and the ISEL assess two relatively independent forms of support. In both studies, scores on the three administrations of the ISEL were highly correlated and not significantly different. Thus, only data from the pretreatment ISEL was used in the prospective analyses.

Smoking Outcomes

At the end of treatment, 60.9% of the subjects in Study 1 were abstinent, as compared to 57.8% of the subjects in Study 2. The respective percentage abstinent in each study dropped to 51.6% and 50.0% at 1 month posttreatment, to 42.2% and 51.6% at 2 months posttreatment, to 39.1% and 42.2% at 3 months posttreatment, to 25% and 31.3% at 6 months posttreatment, and to 35.9% and 32.8% at 12 months posttreatment. In both studies, the smoking status of several subjects fluctuated over the follow-up period; it was not uncommon for a subject who was abstinent at the end of treatment to "slip" and subsequently to abstain again. Eleven subjects (17.2%) in Study 1 and 15 subjects (23.4%) in Study 2 were abstinent continuously through the 1-year follow-up.

A second smoking outcome, the percentage of baseline smoking rate (hereinafter referred to as percentage rate), was also calculated for all subjects at each assessment point. Percentage rate is a more clinically meaningful outcome than a simple rate measure since it both reflects changes in smoking from baseline and controls for individual differences in initial level of smoking. The percentage rate for subjects who were smoking at each assessment point in Study 1 gradually rose from 50.8% at the end of treatment to 75.1% at the 1-year follow-up. In Study 2, the respective rates rose from 20.0% to 76.6%.

Predicting Cessation

Perceived availability of general support. We hypothesized that subjects with high levels of perceived support would be more successful at quitting than those with low levels of support. Prospective tests using the pretreatment measure of the perceived availability of general support (ISEL) confirmed this hypothesis only in Study 2. Treatment successes had a mean pretreatment ISEL score of 35.1 ($SD = 4.9$) as compared to a mean of 32.3 ($SD = 6.5$) for treatment failures, $t(62) = 1.97, p < .05$. This difference in full-scale scores was reflected in two

of the subscales of the ISEL. Abstainers had significantly higher appraisal support ($M = 8.1, SD = 2.0$ vs. $M = 6.5, SD = 2.9$), $t(62) = 2.66, p < .01$, and higher self-esteem support ($M = 8.7, SD = 1.3$ vs. $M = 8.1, SD = 1.9$), $t(62) = 2.11, p < .05$, than did end-of-treatment smokers. Although end-of-treatment abstainers in Study 1 also had higher pretreatment ISEL scores than did end-of-treatment smokers (33.5 vs. 32.1), this difference was not significant.

A similar, significant prospective relation was found between pretreatment levels of general support and percentage rate at the end of treatment in Study 2. High levels of perceived support were associated with greater reductions in smoking, $r(64) = -.48, p < .001$. Of the four subscales of the ISEL, only appraisal support, $r(64) = -.52, p < .001$, and belonging support $r(64) = -.52, p < .001$ were significantly correlated with percentage rate. In Study 1, however, there was no relation between perceived support pretreatment and percentage rate at the end of treatment, $r(64) = -.06$.

Thus, the results of Study 2 strongly support the hypothesis that general social support is an asset to cessation. Of the four functions of support, appraisal support consistently showed a significant effect, with belonging and self-esteem support occasionally also reaching significance. This suggests that having someone to talk to about one's problems may be important in achieving a behavior change. In Study 1, however, general social support was not related to cessation.

Partner support for quitting. Support for quitting was concurrently related to treatment success in Study 1, but not in Study 2. Abstainers at the end of treatment in Study 1 received higher PIQ scores ($M = 22.4, SD = 15.5$) than did smokers ($M = 13.5, SD = 15.7$), $t(60) = 2.20, p < .05$. High partner support was also associated with lower percentage rates, $r(62) = -.24, p = .05$. One can as easily conclude from this correlation that quitting led to high levels of partner support as one can infer that high levels of partner support led to quitting. To help disentangle the direction of causality in this correlation, smoking status in the week prior to the end of treatment was partialled out of the relation between the PIQ and percentage rate at the end of treatment. The resulting partial correlation was $.19, p = .07$, suggesting that partner support may influence quitting. In Study 2, abstainers and smokers at the end of treatment had comparable scores on the PIQ ($M = 21.2, SD = 18.3$ for abstainers vs. $M = 23.0, SD = 15.8$ for smokers). The correlation between partner support and percentage rate was marginally significant, $r(36) = -.31, p = .07$. It was more difficult, however, to achieve significant results using the PIQ in Study 2 than in Study 1 because the number of subjects with partners was much smaller in the second study (36 vs. 64). Nevertheless, from both studies, there is a trend for support for quitting to be related to reductions in smoking at the end of treatment.

Social network measures. We hypothesized that high proportions of smokers in one's social network would be associated with the failure to quit. For the most part, the social network questions were unrelated to cessation. Neither the number of other smokers in the subjects' households nor the proportion of coworkers who smoke differed between end-of-treatment abstainers and smokers in either study. Treatment failures in Study 1 did, however, report at pretreatment a greater number of friends who smoked ($M = 2.0, SD = .86$) than did treatment

successes ($M = 1.6$, $SD = .79$), $t(62) = 2.08$, $p < .05$. Study 2 did not replicate this result; treatment failures and successes reported similar numbers of friends who smoked (1.8 vs. 1.7). In both studies, the network measures were also unrelated to percentage rate. Thus, the results of the two studies tentatively suggest that friends who smoke may be a hindrance to quitting, but not always.

Predicting Maintenance

The most important question that arises in maintenance is the prediction of relapse. A second critical question concerns the timing of relapse. In other words, are the factors that are associated with short-term maintenance different either in their magnitude or nature than those that are associated with long-term maintenance? In order to answer these questions, only data from subjects who were abstinent at the end of treatment were analyzed. In addition, two assessment points were chosen a priori to represent short-term maintenance and long-term maintenance. These were the 3- and 12-month follow-up points. At each of these two assessment points, subjects were divided into relapsers and abstainers. Relapsers were subjects who were abstinent at the end of treatment and who had relapsed and continued to smoke by the follow-up point. Abstainers were subjects who were continuously abstinent at each assessment point prior to and including either the 3- or 12-month point. In addition, subjects who were classified as abstainers at the 12-month point needed to pass the biochemical verification of abstinence at the 6-month follow-up. This is a very stringent definition of abstinence at the 12-month point, since it requires the *continuous* maintenance of abstinence for 1 year. Within this schema, subjects who relapsed and subsequently quit during the follow-up period did not fit either definition and were thus not included in the data analyses. In Study 1, 19 subjects had relapsed by the 3-month follow-up and 20 remained abstinent. In Study 2, there were 12 relapsers and 26 abstainers at 3 months. By 12 months, in Study 1 there were 26 relapsers and 11 continuous abstainers, and in Study 2 there were 21 relapsers and 15 continuous abstainers.

We used *t* tests to assess whether there were significant differences between the relapsers and abstainers at the 3- and 12-month follow-up points. Similar to cessation, we hypothesized that abstainers would have higher levels of both perceived general support and partner support for quitting than would relapsers, and that abstainers would have fewer smokers in their social networks than relapsers.

At the 3-month follow-up, only one factor significantly differentiated between relapsers and abstainers: the perceived availability of general support. In Study 1, subjects who abstained through 3 months had higher levels of perceived general support ($M = 35.3$, $SD = 3.2$) than did those who relapsed ($M = 31.6$, $SD = 6.8$), $t(37) = 2.19$, $p < .05$. Post hoc analyses examining the four functions of support revealed that this difference between relapsers and abstainers was due largely to differences in levels of appraisal support. Abstainers had significantly higher levels of the perceived availability of appraisal support ($M = 8.2$, $SD = 1.5$) than did relapsers ($M = 5.9$, $SD = 2.6$), $t(37) = 3.41$, $p < .01$. This finding was not replicated in Study 2; there were no differences in levels of perceived general support

between abstainers and relapsers at 3 months. Neither partner support for quitting nor the network variables predicted relapse at 3 months in either study. Although there was a trend for abstainers in Study 1 to have received more support from their partner for quitting during treatment ($M = 25.9$, $SD = 14.6$) than did relapsers ($M = 18.4$, $SD = 15.9$), this difference was not significant, $p = .10$.

The factors that influenced long-term maintenance at the 12-month follow-up differed from those that were significant at 3 months. By 12 months there were no significant differences, in either study, between relapsers and continuous abstainers either on perceived availability of general support or on partner support received for quitting. The network variables, however, proved to be significant predictors of long-term maintenance. In Study 1, subjects who successfully abstained were less likely to have another smoker in their household ($M = 1.3$, $SD = .47$) than were relapsers ($M = 1.7$, $SD = .47$), $t(35) = 2.37$, $p < .05$. In Study 2, there was not a significant effect for the presence of other household smokers on relapse, perhaps because relatively few subjects lived with another smoker. However, in Study 2, having a high proportion of smokers among one's friends was a hindrance to long-term maintenance. Relapsers reported having significantly higher numbers of friends who smoked ($M = 2.0$, $SD = .86$) than did abstainers ($M = 1.4$, $SD = .51$), $t(34) = 2.4$, $p < .05$. In both studies there was also a trend, $p = .10$, for relapsers to have a higher proportion of smokers among their coworkers ($M = 1.7$ in Study 1; $M = 1.6$ in Study 2) than did successful abstainers ($M = 1.2$ in Study 1; $M = 1.1$ in Study 2). Thus, in both studies, having smokers in one's social network hindered maintenance, but their negative influence does not seem to take effect until relatively late in the process.

Discussion

Although there were inconsistencies in the results across the two studies, there was evidence for the role of all three types of support processes in cessation and maintenance. The results suggest, too, that these factors may operate at different points in the process of becoming and remaining an ex-smoker. High levels of partner support for quitting and the perceived availability of general support were assets early in the behavior change process—with initial cessation and short-term maintenance. They did not influence long-term, continuous abstinence. The presence of smokers in subjects' social networks, on the other hand, had its major and negative impact on abstinence later in the maintenance process.

In each of the two studies, a different support factor predicted initial cessation. These failures to replicate may be explained, in part, by differences in the populations sampled. High levels of partner support were associated with cessation only in Study 1, which included only married subjects. The sample in Study 2 was more heterogeneous, including single individuals. Given the relatively small number of subjects with partners in Study 2, it may not be surprising that the findings, though often in a similar direction to Study 1, did not reach significance. Two other studies (Coppotelli & Orleans, 1985; Mermelstein et al., 1983) have also found evidence for the beneficial role of a partner's direct support for quitting in both cessation and short-term maintenance. We may thus conclude that support from

a partner may affect initial behavior change through its direct influence on the target behavior.

High levels of perceived general support also aided initial cessation, but only in the sample that included a relatively large percentage of single subjects. Two support functions, appraisal support and self-esteem support, were particularly important to cessation. Most smokers consider quitting to be a difficult and stressful process. Having confidants to whom one could turn to help reappraise stressful situations as nonthreatening or to provide adequate coping resources aided cessation. Quitting may also result in threats to one's self-esteem when subjects have trouble coping with not smoking. Thus, relationships that provided a source of self-enhancement, acceptance, and approval also aided cessation.

Although perceived general support did not predict initial cessation in Study 1, it did predict the short-term maintenance of abstinence. It is possible that Study 1 subjects' use of partner support during treatment precluded their use of other support resources at that time. Subjects with partners who were highly supportive of their quitting efforts may not perceive a need to use other support resources while they are quitting, even if these other resources are available. However, once treatment has ended, successful subjects may once again turn to their friends and confidants to help them cope with a variety of stressors and hassles. Previous research (Marlatt & Gordon, 1980; Shiffman, 1982) has emphasized the association between negative emotional states or stress and relapse relatively early in the maintenance process. Social support in the first few months of post-treatment may help to buffer abstainers from the negative effects of stress on relapse.

Both partner support and general support had their impact early in the behavior change process and did not influence long-term maintenance. One needs to consider that both partner support and general support, like quitting, are dynamic processes that change with time and with changes in the subjects' smoking behavior. Once treatment has ended or initial abstinence has been achieved, partners or others may not perceive the need to continue to reinforce the subject's efforts or may simply tire of providing support. Similarly, once subjects achieve their initial goal and perceive a decrease in the stress of being in treatment and quitting, they may no longer seek support that is directly related to the behavior change. In addition, during maintenance, a subject's "slips" may be discouraging to a partner who has tried to be helpful. As a result, the partner may decrease support rather than increase it at a critical time. It may be important, then, to provide reinforcement and encouragement to the support person as well in order to maintain his or her helpful behavior.

The present two studies also provide evidence for the negative impact of social network smokers on the long-term maintenance of abstinence. Although the results of the two studies each supported a different relevant network factor (household vs. friends), there was replication across the studies for the importance of the network variable at 12-month posttreatment. In addition, the relative importance of friends or household smokers in each study coincided with the difference in their subject samples.

The findings of both studies strongly suggest that network smokers do not exert their major influence on abstinence until

relatively late in the maintenance process. Our results thus corroborate and help to clarify previous research that suggests that smoking among significant others hinders maintenance (e.g., Eisinger, 1971; Graham & Gibson, 1971; Swartz & Dubitsky, 1968), but does not seem to matter in initial behavior change (Gunn, 1983; Guilford, 1967).

Social network smokers may have a negative influence in several ways. First, they may limit the number of people subjects turn to for support. Smokers who are trying to maintain abstinence may not perceive other current smokers as viable sources of appraisal or self-esteem support. This may be particularly crucial later in maintenance as other, nonsmoking support persons start to gradually decrease their support. Alternatively, as time passes after posttreatment, the subjects themselves may perceive that they need less support or no longer need to engage in previous cessation strategies, which may have included limiting their contact with other smokers. Finally, social network smokers can directly hinder abstinence by providing models for smoking and access to cigarettes.

The results of the present two studies clearly argue for the utility of conceptualizing the process of quitting smoking as having several distinct phases. Our data suggest three: initial cessation, short-term maintenance, and long-term maintenance. Other researchers (e.g., Prochaska & DiClemente, 1983) have similarly suggested the importance of examining different stages of quitting. It is thus important for future researchers to examine psychosocial predictors of behavior change within a multistage model.

Our conclusions from the studies need to be tempered because of the inconsistencies in results across studies and the relatively small number of subjects in each. Future research needs to examine how support processes influence cessation and maintenance in other populations, such as with single smokers or unaided quitters. In addition, examining how support changes over time and with changes in the target behavior is likely to provide more insight into the process through which support influences behavior change. Along these lines, new instruments for assessing support during maintenance may need to be developed. For example, it is possible that partners do continue to provide support for change during maintenance, but that our measure of partner support, with its emphasis on the treatment and cessation phase, did not capture the changing nature of support during maintenance. We are currently examining the predictive utility of a maintenance-oriented PIQ. In addition, more work needs to be done on determining whether and for which kinds of support subjects may use smokers in their social networks. We have already developed an appraisal network measure, the Social Network Inventory for Tobacco Smokers (SNITS) to address this issue.

Finally, our results suggest new avenues for intervention. Although recent intervention studies geared at enhancing partner or coworker support for quitting (e.g., Malott, Glasgow, O'Neill, & Klesges, in press; McIntyre et al., 1986) have yielded disappointing results, other support manipulations may yet be useful. For example, our results suggest that it may be important to teach subjects to continue to use nonsmoking support resources well beyond the treatment phase and also to increase the awareness of significant others for the need to continue to support subjects during maintenance.

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