Social support in smoking cessation: Reconciling theory and evidence

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Abstract

Introduction: The majority of smokers attempt to quit smoking on their own, but in any given year, only 5% or less are successful. To improve cessation rates, tapping social networks for social support during quitting has been recommended or tested in some interventions. Prior reviews of this research, however, have concluded that there is little to no evidence that partner support interventions are effective.

Discussion: Given the theoretical importance of the concept of social support, its demonstrated value in treatments that are implicitly supportive (e.g., telephone counseling), and the general lack of a guiding conceptual framework for research on the effects of peer or partner support for cessation, we describe theoretical models that explicitly incorporate social support constructs in predicting motivation for and success in quitting.

Conclusion: Better differentiation of support concepts and elucidating causal pathways will lead to studies that demonstrate the value of social relationships in improving smokers’ likelihood of cessation.

The majority of smokers attempt to quit smoking on their own (Fiore et al., 2008) but most fail; abstinence rates among self-quitters average 5% or less within 6–12 months of the attempt (Hughes, Keely, & Naud, 2004). Using cessation medications such as nicotine replacement therapy (NRT) is one way self-quitters can enhance their success, but additional techniques to improve their ability to quit for good would be valuable. One possible strategy is to engage social networks to provide social support for the quit attempt. Several studies have provided evidence suggesting that support from others helps smokers quit. For example, the greater the number of individuals that smokers listed as being able to provide support when quitting (using a web-based program), the more likely they were to have quit at a 6-month follow-up, controlling for use of other cessation products or services (Johnson et al., 2009). In another study, Cobb, Graham, Bock, Papandonatos, and Abrams (2005) found, in an evaluation of a web-based program for cessation, that the use of peer-to-peer social support through forums, E-mails, and/or chat rooms was associated with at least three times greater odds of abstinence at 3 months, controlling for intensity of Web site use. Interventions have also been developed that included training and materials for smokers on how to solicit social support from network members or that assigned smokers to “buddies” from inside or outside the network they who could count on for ongoing support during their quit attempt (Kviz, Crittenden, Madura, & Warnecke, 1994; Orleans et al., 1991).

Reviews of peer social support for quitting

Meta-analyses of studies such as those described above led the 2000 U.S. Public Health Service–sponsored clinical practice guideline Treating Tobacco Use and Dependence (Fiore, 2000) to recommend that smokers be provided with social support as part of treatment and that they should be helped in obtaining support from others outside the treatment environment. Its most recent updated guideline, however, excluded the latter recommendation (Fiore et al., 2008). This action was a result of recent literature questioning the research purporting to find benefits of cessation programs that attempted to use smokers’ social networks to facilitate cessation. Piasecki and Baker (2001), for example, pointed out that many interventions with socially supportive treatments often included additional intervention activities and were therefore not true tests of social support’s effects. Other investigators have similarly pointed out that support programs involving peers were often adjuncts or supplements to existing interventions, such as group-based or telephone counseling (May & West, 2000; Park, Schultz, Tudiver, Campbell, & Becker, 2004; Park, Tudiver, Schultz, & Campbell, 2004). May and West’s review, in particular, pointed out that of all the studies they reviewed, only one examined the effects of adding a buddy component to a self-help intervention (Orleans et al., 1991). In that study, however, only 58% of subjects in the support condition gave out support guides (as required) to buddies. Moreover, there were no differences between groups in the number of allies invited to help, in perceptions of support, or in abstinence outcomes. In the Park, Tudiver et al. (2004) review, which included several studies from the May and West paper, five of the nine studies fitting their inclusion criteria tested support interventions that were supplemental to the intratreatment support provided through group treatment programs or nicotine replacement therapy (NRT) is one way self-quitters can enhance their success, but additional techniques to improve their ability to quit for good would be valuable. One possible strategy is to engage social networks to provide social support for the quit attempt. Several studies have provided evidence suggesting that support from others helps smokers quit. For example, the greater the number of individuals that smokers listed as being able to provide support when quitting (using a web-based program), the more likely they were to have quit at a 6-month follow-up, controlling for use of other cessation products or services (Johnson et al., 2009). In another study, Cobb, Graham, Bock, Papandonatos, and Abrams (2005) found, in an evaluation of a web-based program for cessation, that the use of peer-to-peer social support through forums, E-mails, and/or chat rooms was associated with at least three times greater odds of abstinence at 3 months, controlling for intensity of Web site use. Interventions have also been developed that included training and materials for smokers on how to solicit social support from network members or that assigned smokers to “buddies” from inside or outside the network they who could count on for ongoing support during their quit attempt (Kviz, Crittenden, Madura, & Warnecke, 1994; Orleans et al., 1991).

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psychotherapy. The remaining studies were the Orleans et al. investigation described above and three other studies that did not find significant differences between the support intervention and control groups (see Nyborg & Nevid, 1986; Powell & McCann, 1981).

### Limitations of investigations of peer support for quitting

A problem with interventions designed to increase social support for quitting, but that is supplemental to an established and efficacious treatment such as telephone counseling or group programs, is that they may exhibit ceiling effects; the intratreatment support may have adequately met smokers’ support needs during and after quitting. Similarly, the extratreatment support may not have been intense enough to influence quitting over and above the intratreatment support (May & West, 2000). A better test of the effects of peer or partner support for self-quitters would be a randomized controlled trial (RCT) that compared a peer or partner support program with a control group that received minimal treatment (e.g., booklets).

The lack of a theoretical framework to guide interventions, as well as methodological limitations, has also been noted in the reviews of studies that investigated the effects of peer support for quitting (Hogan, Linden, & Najarian, 2002; May & West). These limitations include lack of differentiation among structural and functional support concepts, not randomizing participants to conditions, failure to measure baseline support, using only participants who had buddies available to help (and who therefore might nevertheless provide support even if placed in the control group), failure to verify participants’ engagement of peer support, no measurement of perceived support, or if so, only among participants who remained at the end of the treatment, small samples, and an absence of biologically verified abstinence.

May and West (2000) also pointed out that in studies that assessed the supportiveness of a spouse or partner, the Partner Interaction Questionnaire (Mermelstein, Cohen, Lichtenstein, Baer, & Kamarck, 1986) was used. They noted a problem with this scale in that “some of the negative ‘support’ behaviors are only applicable if a person is still smoking,” for example, “criticize your smoking” and “refuse to clean up your cigarette butts,” whereas some positive partner behaviors are only applicable if a person is still smoking, for example, “complimented my not smoking” or “celebrated my quitting with me.” As May and West stated, it would not be surprising to find negative behaviors to be more strongly associated with smoking and positive ones with abstaining.

### Intratreatment social support is effective

Although the problems described above precluded conclusions by prior reviews about the value of peer or partner support in helping smokers quit, the updated Clinical Practice Guidelines nevertheless emphasized the importance of support provided by treatments for cessation (i.e., intratreatment support). This endorsement implicitly acknowledges that behavioral treatments for smokers shown to be effective in randomized clinical trials, specifically individual or telephone counseling and group programs (Lancaster & Stead, 2008; Stead & Lancaster, 2009; Stead, Perera, & Lancaster, 2009), provide high levels of informational, instrumental, and in many cases emotional support for smokers. Emotional support “involves the expression of empathy, caring, reassurance, and trust and provides opportunities for emotional expression and venting” (Cohen, 2004). Instrumental support “involves the provision of material aid, for example, financial assistance or help with daily tasks.” Informational support “refers to the provision of relevant information intended to help the individual cope with current difficulties and typically takes the form of advice or guidance in dealing with one’s problems” (Cohen). Telephone quitlines obviously provide emotional support for smokers (the California Helpline, e.g., instructs counselors to acknowledge, discuss, and clarify smokers’ desire to change and their related fears or ambivalence regarding quitting; Zhu et al., 1996). Quitlines also provide information on quitting strategies and cessation medications (i.e., informational support), and group therapy programs are a source of emotional and informational support through “discussion and sharing of experiences and problems” (Stead & Lancaster, p. 5).

An example of instrumental support provided by these effective interventions would be the free NRT or cessation medications that are sometimes available for qualified smokers.

While there may be factors that influence how effective professional support would be compared with that from peers or partners (e.g., smokers may be more motivated to please a professional counselor or see them as more credible and objective sources of information), only by investigating the extent to which others can effectively provide these supportive functions will the potential value of social networks in facilitating cessation become apparent. Understanding how social network members can assist quitters would be useful because the majority of adult smokers attempt to quit on their own (Larabie, 2005) because they do not have the inclination or time to participate in behavioral treatment programs (indeed quitlines reach only between 1% and 2% of smokers; North American Quitline Consortium, 2009). Social network members can influence smokers to seek professional help such as from quitlines (Muramoto, Wassum, Connolly, Matthews, & Floden, 2010; Patten et al., 2008), but network members are also themselves motivated to support smokers in their quit attempts in any way they can (Thomas et al., 2008), especially judging from the number of calls to quitlines by family members or friends of smokers (Zhu, Nguyen, Cummins, Wong, & Wightman, 2006). They are even willing to undergo training in order to better help family members or friends quit (Campbell, Mays, Yuan, & Muramoto, 2007). Using social networks to provide cessation support for smokers is therefore a promising strategy for helping smokers quit, whether or not smokers choose to use existing treatments.

### Using theory in research on social support and quitting

As noted earlier, a significant gap in studies examining the effects of peer or partner social support for smokers is the lack of a conceptual or theoretical framework that explains how social support...
from others is supposed to operate in helping smokers quit. This contrasts with interventions involving family members and peers that have been developed for substance abusers (Fernandez, Begley, & Marlatt, 2006; Litt, Kadden, Kabela-Cormier, & Petry, 2007). In a recent review of these programs, Fernandez et al. found that newer interventions that included techniques from Motivational Interviewing (Miller & Rollnick, 2002), that included an optimal amount of social pressure and nonconfrontational approaches and that were flexible, appeared to be the most effective. Nonetheless, they noted that “research on these newer interventions remains in its infancy” and that “further research to examine mechanisms of action is needed” (p. 211).

Having a model or framework that specifies the mechanisms of action of support from network members could potentially help investigators designing support interventions determine why an intervention was effective or not and what can be done to improve it. For example, if the hypothesized effect of a support intervention targeting spousal smokers is to increase their self-competence for quitting, then repeatedly measuring spouses’ provision of support, and the smoker’s self-competence at baseline and during the treatment, would help determine if the intervention indeed increased self-competence and whether self-competence increased the likelihood of quitting.

Even for interventions established as effective, a theoretical framework for how the support provided influences quitting is often absent (exceptions, which are discussed below, are the autonomous support model, Williams, Niemiec, Patrick, Ryan, & Deci, 2009; Williams et al., 2006, and the family systems FAMCON approach; Rohrbaugh et al., 2001). For example, research demonstrating the efficacy of quitlines typically has not assessed potential mediators of their effects, for example, whether the emotional support provided by trained counselors helped smokers quit by reducing their anxiety about quitting, increasing their self-efficacy in coping with withdrawal symptoms, increasing their use of behavioral coping strategies, and/or helping them cognitively reframe lapses. These effects are likely assumed by investigators, but only by assessing these variables will it be known which constructs are most important or whether they are equally important in explaining the relationship between the treatment support and abstinence. This knowledge could potentially lead to more effective professionally led interventions.

In the present paper, we describe social support constructs that we believe are important in determining how socially supportive strategies help smokers quit, regardless of whether the support is provided from health professionals or peers. We also outline possible theoretical models that incorporate these constructs and that we believe can be used to guide subsequent research examining the effects of peer or partner social support on smoking cessation success.

**Literature update**

As described above, several comprehensive reviews have previously examined the extent to which peer or partner support interventions helped smokers quit. We wanted to first determine if subsequent to the last meta-analytic review in 2004 of partner support interventions, additional RCTs had been conducted that demonstrated benefits of social network support for smokers. We thus conducted our own review that included published studies and dissertations or theses from 2004 and later. We searched for RCTs that compared smokers who received an intervention to enhance peer or partner support with smokers who did not receive the support intervention and in which abstinence (however defined) at any timepoint following treatment was an outcome variable. Searches were conducted using the PubMed, PsycInfo, and Dissertation and Theses databases by pairing smoking or tobacco with cessation or abstinence together with support, spouse, worksite, workplace, couples, buddy, partner(s), family, friend, or coworker. Articles cited in reference sections of these papers were also examined for possible inclusion.

Our literature search retrieved 186 records. These included 21 RCTs, 17 of which did not meet inclusion criteria. Specifically, in seven studies, the engagement of peer or partner support was not a goal of the study; in six studies, the support was provided by health professionals such as nurses; in two studies, the intervention group received both a standard cessation program and a support but the control group did not receive the cessation program; one study combined data from three RCTs but did not randomize to different levels of partner support; and in another study, peer support was provided in both the intervention and the control groups (see Table 1 for more specific descriptions of excluded studies).

Of the four studies that met the inclusion criteria (Table 2), two showed no difference in abstinence rates between the intervention and control groups at any of the follow-ups (May, West, Hajek, McEwen, & McRobbie, 2006; McBride et al., 2004). In both of these studies, however, the peer support intervention was in addition to an existing professionally led support program found in previous research to be effective (e.g., group therapy sessions or telephone counseling). Null effects could therefore be attributed to ceiling effects as described earlier. In contrast, the remaining two studies both found significant advantages of the peer support intervention at the end of treatment and/or at a 3-month follow-up (Hennrikus et al., 2010; Solomon et al., 2005). In one of these studies, pregnant smokers identified a supporter from her social network and half of these supporters received instructions from a counselor on how to be supportive (intervention group), whereas the other half did not (control group; Hennrikus et al.). In the second study, low-income women receiving nicotine patches were randomized to either receive telephone support from a peer who was an ex-smoker who had received 8 hr of training for the intervention, or to a control group that did not receive this peer support. In addition to the significant difference in abstinence at the 3-month follow-up, this study also found a trend for the 6-month follow-up; the percent abstinent in the intervention group (33%) was greater than in the control (26%), though the difference was not statistically significant (Solomon et al.). These studies suggest that at least for quitting in the short-term peers trained to be supportive can increase abstinence rates.

In the two studies that obtained significant effects of support, a guiding conceptual framework for understanding the positive effects obtained was not described, and thus, possible mediators were not examined. Only by specifying and testing models of how social support constructs influence quitting will research and interventions targeting peer or partner support elucidate why, when, and for whom peer or partner support promotes the initiation and/or maintenance of quitting.
Intervention group received both Internet cessation program and peer E-mail support, whereas control group received neither.

Randomized medical practices to intervention condition (consisting of providing tested effects of cessation advice and materials provided by trained midwives. Intervention and control did not have goal of changing support mobilization of pregnant women.

Wiggers et al. (2006) Examined effects of automated mobile phone support messages. Intervention group received both Internet cessation program and peer E-mail support, whereas control group received neither.

Supported by midwives at medical practices in Netherlands.

Supported by midwives at medical practices in Netherlands.

Health professionals (nurses) provided individual support or through group sessions.

Cessation intervention directed to smokers who are partners of pregnant women.

Health professionals (nurses) provided referrals for cessation treatment (or not provide) referrals to telephone quitline counseling for smokers.

Clinical hypnotherapists provided autonomy supportive or control treatments.

Compared nicotine replacement therapy with placebo.

Worksites intervention did not include peer or partner support.

Health professionals (nurses) provided support for cessation.

Intervention delivered by physicians.

Table 1. Randomized controlled trials excluded from consideration of effects of peer or partner support on smoking cessation

<table>
<thead>
<tr>
<th>Study</th>
<th>Reason for exclusion</th>
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<tbody>
<tr>
<td>An et al. (2008)</td>
<td>Intervention group received both Internet cessation program and peer E-mail support, whereas control group received neither.</td>
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<tr>
<td>Aveyard et al. (2007)</td>
<td>Health professionals (nurses) provided support during clinic visits or by telephone.</td>
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<tr>
<td>Aveyard, Lawrence, Evans, and Cheng (2005)</td>
<td>Tested effects of cessation advice and materials provided by trained midwives. Interventions and control did not have goal of changing support mobilization of pregnant women.</td>
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<tr>
<td>de Vries, Bakker, Mullen, and van Breukelen (2006)</td>
<td>Support provided by midwives at medical practices in Netherlands.</td>
</tr>
<tr>
<td>Free et al. (2009)</td>
<td>Intervention group received both Internet cessation program and peer E-mail support, whereas control group received neither.</td>
</tr>
<tr>
<td>Klatt et al. (2008)</td>
<td>Tested effects of cessation advice and materials provided by trained midwives.</td>
</tr>
<tr>
<td>Lawhon, Humfleet, Hall, Munoz, and Reus (2009)</td>
<td>Intervention group received both Internet cessation program and peer E-mail support, whereas control group received neither.</td>
</tr>
<tr>
<td>Mermelstein and Turner (2006)</td>
<td>Peer support provided in both intervention and control groups among high-school students. Trained adult facilitators provided additional support for intervention group.</td>
</tr>
<tr>
<td>Murray et al. (2008)</td>
<td>Randomized medical practices to intervention condition (consisting of providing referrals for cessation treatment) or to a control condition (no referrals).</td>
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<tr>
<td>Patwardhan (2009)</td>
<td>Randomized pharmacies to provide (or not provide) referrals to telephone quitline counseling for smokers.</td>
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<tr>
<td>Solloway, Solloway, and Joseph (2006)</td>
<td>Clinical hypnotherapists provided autonomy supportive or control treatments.</td>
</tr>
<tr>
<td>Stanton, Lowe, Moffatt, and Del Mar (2004)</td>
<td>Cessation intervention directed to smokers who are partners of pregnant women (support between partners not investigated).</td>
</tr>
<tr>
<td>Tanaka et al. (2006)</td>
<td>Worksite intervention did not include peer or partner support.</td>
</tr>
<tr>
<td>Wiggers et al. (2006)</td>
<td>Health professionals (nurses) provided support for cessation.</td>
</tr>
<tr>
<td>Williams et al. (2002)</td>
<td>Intervention delivered by physicians.</td>
</tr>
<tr>
<td>Wilson, Fitzsimons, Bradbury, and Stuart Elborn (2008)</td>
<td>Health professionals (nurses) provided individual support or through group sessions.</td>
</tr>
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</table>

Modeling the role of social support in smoking cessation

As described previously, there are three generally accepted functions of social support: emotional, informational, and instrumental. These support functions can be “abstinence specific” in that they pertain to support specifically for the quit attempt, or they can be more general. An example of abstinence-specific emotional support would be providing a smoker the opportunity to vent emotions about the difficulty of abstaining. More generally, emotional support can contribute to a calm and secure interpersonal environment that helps make the difficult task of quitting more achievable (Mermelstein et al., 1986). Instrumental support that is abstinence specific would be providing NRT or providing transportation for a smoker to attend a group therapy cessation session. More general instrumental support would be helping a partner with daily chores that might have the effect of reducing feelings of stress or involving the partner in activities that distract him or her from withdrawal symptoms.

Pathways in which these support functions can directly or indirectly influence the likelihood of making a quit attempt and/or achieving success in quitting are presented in Figure 1. One perspective depicted is a stress-buffering model (also known as the “stress and coping” model) of social support, as described in the psychological literature (Cohen, Gottlieb, & Underwood, 2000). According to this model, perceiving support to be available when needed minimizes the appraisal of stressors as threatening, reduces the negative physiological effects of stressors (i.e., stress responses such as increased heart rate and blood pressure), and allows individuals to engage more successfully in adaptive coping strategies (Paths 1–5 in Figure 1). Adaptive coping (e.g., relaxation training, or exercising to cope with cravings in the case of smoking cessation) would further minimize the negative impact of the stressor. This model can be applied to cessation because abstaining from smoking is arguably stressful for many smokers and causes withdrawal symptoms, including negative affect, that increase the likelihood of relapse (Brandon, 1994; Kassel, Stroud, & Paronis, 2003; Perkins & Grobe, 1992).

In coping with stress and negative affect during quitting, emotional support, whether general or abstinence specific, may be particularly helpful because of its potential for stress buffering (Lepore, 1998; Lepore, Allen, & Evans, 1993). For example, a smoker who perceives that she or he can discuss daily hassles with a spouse or friend, or who receives empathic responses and validation for negative emotions experienced during a quit attempt, may be better able to cope not only with daily hassles but also the abstinence-specific consequences of quitting smoking, namely withdrawal symptoms. Better coping with daily stressors and with withdrawal symptoms should theoretically
increase the ability to abstain, at least in the short term. Research addressing the validity of this model could also examine the relative importance of perceptions of the availability of emotional or other support versus the amount of actual support received. These could be evaluated for their ability to lower stress appraisals and withdrawal symptoms and to increase adaptive coping and the ability to quit. Informational support may be less relevant to the stress-buffering perspective, however, and more likely to have a direct effect on adaptive behavioral responses (Path 6).

A theoretical model of the support process for smokers that focuses on how of support is provided is the autonomous support perspective of Williams et al. (Williams, Gagne, Ryan, & Deci, 2002; Williams et al., 2009). They define autonomous support as support that permits the receiver to experience a sense of volition, choice, and control. Based on excerpts from self-determination theory (Deci, Eghrari, Patrick, & Leone, 1994; Deci & Ryan, 1987, 1990), autonomous support is hypothesized to increase (autonomous) motivation and self-competence, which should make behavior change more likely (Paths 9–15). In an intervention in which smokers received supportive counseling sessions sensitive to their autonomy versus receiving pamphlets and referrals, autonomous counseling was associated with greater abstinence at 24 months compared with the control group (Williams et al., 2009). A comparison of physicians’ use of an autonomous supportive style with that of a controlling style, however, found that 7-day point prevalence abstinence rates were greater for the controlling style, though not statistically significantly so, at 6 months (13.0% vs. 7.8%), 12 months (13.0% vs. 11.2%), 30 months (20.3% vs. 18.1%), and for abstinence at all timepoints as well (9.7% vs. 5.2%; Williams et al., 2002). Structural equation modeling (SEM) analyses nevertheless demonstrated that the intervention led to smokers’ perceiving higher levels of autonomous support that in turn predicted greater autonomous motivation. Autonomous motivation, in turn, predicted continuous abstinence. Similar SEM analyses using a different sample of smokers who received autonomous support from professional counselors found that autonomous motivation at 1 month predicted greater perceived

Table 2. Randomized controlled trials included in consideration of effects of peer or partner support on smoking cessation

<table>
<thead>
<tr>
<th>Study</th>
<th>Description</th>
<th>Outcome</th>
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<tr>
<td>Henriksen et al. (2010)</td>
<td>Pregnant smokers (n = 82) identified supporter from social network. Supporter in intervention group received instructions from counselor; control group supporter did not</td>
<td>Intervention group more likely to quit at end of pregnancy (13.0% vs. 3.6%) and 3 months postpartum (9.3% vs. 0%)</td>
</tr>
<tr>
<td>May et al. (2006)</td>
<td>Smokers (n = 563) randomized to receive or not receive buddy support from a participant in group smoking cessation program.</td>
<td>No difference at 26 weeks postquit date between experimental and control groups in continuous abstinence using intent-to-treat (13% vs. 15%)</td>
</tr>
<tr>
<td>McBride et al. (2004)</td>
<td>Pregnant smokers (n = 583) randomized to control group (provider advice to quit and self-help guide); (b) control materials plus 6 telephone calls by health advisor; or (c) control materials, telephone calls, and telephone counseling (and written guide) for partners of women on how to support their quitting</td>
<td>No difference in abstinence between groups at any follow-up</td>
</tr>
<tr>
<td>Solomon et al. (2005)</td>
<td>Low-income women smokers (n = 330) receiving nicotine patches randomized to (a) receive telephone support from a peer (ex-smoker with 8-hr training) over a 4-month period or to (b) control group with no telephone support</td>
<td>Intervention group more likely to have quit at 3 months (43% vs. 26%) but not at 6 months (33% vs. 26%)</td>
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The importance of the smoker maintaining a sense of control and freedom in response to others’ provision of support is also emphasized in the family consultative (FAMCON) model of smoking cessation (Rohrbaugh et al., 2001). According to this perspective, partner behaviors such as pushing directly or indirectly for change, nagging, or using other negative social influence tactics are evaluated in terms of whether they result in resistance to change, also termed “ironic processes.” This perspective includes the concept of “symptom-system fit” whereby the target behavior (e.g., smoking) serves communication and emotion regulation functions in a relationship (e.g., to preserve distance) that need to be identified. For example, if the partner’s push for quitting results ironically in reduced change, the recommended course of action would be to engage in less of these behaviors, for example, by declaring helplessness, demonstrating acceptance, or simply observing (Rohrbaugh et al.). The FAMCON approach to cessation relies heavily on the professional support of a therapist and also includes standard effective smoking cessation treatment (Shoham, Rohrbaugh, Trost, & Muramoto, 2006). Nevertheless, it points out the potential complexity of using peers, particularly romantic partners, to provide support for smoking cessation.

Structural indices of network support such as social integration, or the proportion of smokers in a network, also have a role to play in theoretical models of the support process for smokers attempting to quit. Social integration refers to the existence and strength of social bonds or the degree of involvement with social ties in an individual’s network (Berkman, Glass, Brissette, & Seeman, 2000). According to Brissette, Cohen, and Seeman (2000), social integration “is a multidimensional construct thought to include a behavioral component—active engagement
in a wide range of social activities or relationships—and a
cognitive component—a sense of communality and identifica-
tion with one’s social roles.” The likelihood of a smoker solic-
ting and/or receiving (or perceiving) emotional, instrumental, or
informational support from others for cessation will likely de-
pend on the smoker’s level of social integration, specifically
whether there are others who can be counted on to provide sup-
portive functions during quitting (Path 7). Social ties can be
characterized not only by number but also by their quality (sat-
isfaction) and type (intimate vs. more distant), which should
also influence how supportive they can be.

Assessing social integration might not seem to be impor-
tant for interventions in which the support person is a desig-
nated peer unknown to the smoker (as in some “buddy”
programs), but if the smoker already has network members to
whom he can turn for support, then enthusiasm and actual use
of an assigned buddy may be diminished. For those who lack
social ties that can serve supportive functions during quitting,
the reverse may be true (i.e., actual use of a buddy may be
greater and perceived as more beneficial). This was the case for
a support group intervention for breast cancer patients in
which only for women who reported lower levels of network
support was the intervention beneficial (Helgeson, Cohen,
Schulz, & Yasko, 2000). The strength or existence, quality, and
type of social bonds of smokers could thus also act as moderators
of the effects of socially supportive interventions involving peers.

The proportion of smokers in the social network is an ad-
nitional structural support construct shown to be associated
with smoking cessation (Gulliver, Hughes, Solomon, & Dey,
1995). Knowing or seeing others who smoke can influence
norms about smoking, or act as triggers or cues for smoking.
Conversely, however, the proportion of nonsmokers or former
smokers in the social network can provide a form of social pres-
sure to quit. Christakis and Fowler (2008) found that stopping
smoking tended to spread within socially connected networks
such that “people appeared to act under collective pressures
within niches in the network” (p. 2256). It is possible that these
effects occurred as a result of feeling implicit pressure to quit
and/or as a result of smokers’ perceptions of norms about quit-
ing. Also possible, however, is that as the number of former
smokers in a social network grows, there is more dissemination
of knowledge within the network about how to quit (i.e., informa-
tional support). Former smokers may also be able to provide
more valuable emotional support to those considering quitting
or attempting to quit. Thus, the smoking status of social net-
work members may facilitate quitting through social pressure
and norms (Path 8) or by influencing the degree to which emo-
tional or informational support is provided to current smokers
(Path 7). These pathways, however, are only part of any theo-
retical model that attempts to understand how social influences
lead to actual cessation.

Other social influence constructs that overlap with social
support, and that would appear to be important in understanding

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**Figure 1.** Pathways through which social support constructs can influence motivation for and success in quitting smoking.
how others can assist smokers in cessation, are positive and negative social control. Social control refers to interactions in interpersonal relationships that involve regulation of another’s behavior (Umberson, 1987, 1992). Positive social control strategies entail the provision of socially supportive behaviors such as emotional support (Tucker & Mueller, 2000), rewarding someone for changing a behavior, pointing to others who have successfully changed their behavior, or offering to help (Lewis & Rook, 1999; Tucker, Orlando, Elliott, & Klein, 2006). Negative social control strategies involve direct pressuring of a person to change their behavior or behaviors or statements that engender negative feelings in the recipient such as guilt or anxiety. Research on the effects of social control strategies consistently find negative social control tactics to be unrelated to health behavior change (including smoking cessation) and to predict negative psychological reactions, such as hostility/irritation or sadness/guilt (Lewis & Rook). The effects of positive social control strategies, however, are less consistent, with studies showing either positive (Lewis & Rook; Tucker et al.) or null effects on behavior change (Helgeson, Novak, Lepore, & Eton, 2004; Thorpe, Lewis, & Sterba, 2008). Although not depicted in Figure 1, positive and negative social control tactics may influence quitting not only through their effects on affect (as examined in prior research) but possibly by influencing motivation to quit as well.

An additional aspect of social support that may be important to consider in theoretical models is whether the support is visible or invisible. Bolger, Zuckerman, and Kessler (2000) have proposed that receiving support that is visible (or explicit) threatens self-esteem and increases distress. In contrast, “invisible” support is theorized to have positive effects on the mood of the receiver. They provide evidence that “a supportive act is most effective when it is accomplished either (a) outside of recipients’ awareness or (b) within their awareness but with sufficient subtlety that they do not interpret it as support” (Bolger & Amarel, 2007). The effects of visible versus invisible support has never been examined in relation to cessation ability but could be accomplished by assessing both support providers and smokers about support provided and received, respectively, and examining their relationships to negative affect and abstinence. This perspective may be important for improving predictions of cessation by socially supportive network members as negative mood is a significant precursor of lapping (Kassel et al., 2003).

Piasecki and Baker (2001) also discuss the possibility that it is smokers’ perceptions of support, rather than actual support received, that predict abstinence (cf., Gulliver et al., 1995; Nides et al., 1995). According to this view, perceived support may be a marker of personal traits that allow these individuals to take advantage of, or benefit from, social ties. Assessing perceived support at baseline and at follow-ups, in addition to actual support provided, would help to address this possibility.

The theoretical pathways described above are not meant to be exhaustive, and some may be bidirectional. Moreover, the importance of other variables in quitting is understood though not depicted. For example, cognitive models of health behavior change emphasize constructs that include the perceived risks of smoking, benefits of quitting, costs or barriers to quitting, cues to action, and expectations of success in quitting (i.e., self-efficacy; Bandura, 1977). In the context of the models diagrammed in Figure 1, these would likely influence motivation to quit and whether an actual quit attempt is subsequently made.

### Moderators and mediators

Moderators or mediators should also be considered when testing models of how social support influences quitting, particularly gender. For example, Mermelstein, Hedeker, & Gerin, (1999) found that subsequent to a group program for cessation simply providing support and reinforcement by telephone improved cessation for women compared with an enhanced follow-up program. For men, however, the converse was true. Gender is also relevant to a stress-buffering model of support, as it is one of several factors that influence the degree to which social support, specifically emotional support received, attenuates the intensity of stress responses. For example, in laboratory studies with nonsmokers, emotional support from female partners decreases both men’s and women’s stress responses (Glynn, Christenfeld, & Gerin, 1999; Kirschbaum, Klauser, Filipp, & Hellhammer, 1995; Lepore et al., 1993), whereas when the recipient is female and the support provider is male, no benefits are realized (Glynn et al., 1999; Kirschbaum et al.). These results suggest that the gender of a smoker and the person providing support during a quit attempt could potentially influence perceived stress, coping, and cessation. Further investigations of this would have implications for buddy or “partner” support interventions. One recent study in which 77% of support providers were female buddies who were enlisted to help a sample of predominantly male smokers quit found that, although not statistically significant, smokers receiving the assistance of their female buddies made more quit attempts and had higher 7-day point prevalence abstinence rates compared with a control group of smokers (Patten et al., 2004). This study and other research (Westmaas, Wild, & Ferrence, 2002) hint that in studies of self-quitters, female buddies might be the most effective providers of support for male smokers attempting to quit.

In addition to gender, other sociodemographic factors such as race, ethnicity, or age should be considered as moderators in determining what types of support, stressors, or coping behaviors may be most beneficial and for whom. For example, some racial or ethnic groups might experience different types of stressors more frequently (e.g., discrimination) and that might be more resistant to the effects of socially supportive interactions.

Personality may be another factor that likely influences the degree of stress-buffering effects of social support for smokers. Westmaas and Jammer (2006) found that the higher participants were in the personality trait of defensiveness, the greater their blood pressure responses to emotional support provided by a peer during a stressful task, even though they self-reported lower negative affect. This indicates that for smokers higher in defensiveness receiving support could paradoxically decrease success in quitting if it elicits heightened physiological stress responses (which can potentially trigger urges and lapsing). Also, autonomous individuals, because of their increased sensitivity to potential threats to their autonomy (Clark, Steer, Beck, & Ross, 1995), may be averse to seeking or receiving social support and may prefer to rely on their own willpower to help them quit. In contrast, women who are higher in sociotropy, a more interpersonal orientation (Clark et al.), may be more accepting of
receiving social support. Social support may be more likely to mitigate their physiological and emotional responses to interpersonal stressors. Other individual difference variables have been shown to moderate appraisals of the availability of support, the extent to which social support is perceived as beneficial, or the actual effects of support on physiological responses. These include hostility (Lepore, 1995), attachment style (Mikulincer, Florian, & Weller, 1993; Mikulincer, Orbach, & Iavnieli, 1998), or perceived similarity to a potential support provider (Klohnen & Luo, 2003; Westmaas & Silver, 2006).

Genetic polymorphisms may also potentially identify individuals who are especially likely to benefit from socially supportive interactions during quitting compared with others. One possibility is a variant of the 5-HTTLPR genotype that is associated with both smoking cessation (Munafo, Clark, Johnstone, Murphy, & Walton, 2004) and vulnerability to depression in response to stressors (Hoefgen et al., 2005; Jacobs et al., 2006; Otte, McCaffery, Ali, & Whooley, 2007; Zalsman et al., 2006). There is also evidence, however, that social support for these individuals is particularly beneficial (Kaufman et al., 2004).

Also potentially influencing the extent to which others’ supportive behaviors influence variables in the model is the source of support, for example, whether the supporter is a spouse versus an assigned buddy in an intervention for smokers. As May and West (2000) point out, it may be more difficult to develop or change established relationship patterns, whereas buddies might benefit from a sense of “common adversity” and can both be recipients and providers of support. Support provided by preexisting social ties may persist for longer; however, still, how supportive these can be may depend on other aspects of the relationship such as its quality or level of satisfaction.

The time course of support provided or perceived may also be important (May & West, 2000). Actual support may be most crucial in the early stages of a quit attempt, when smokers are most vulnerable to relapse. In later stages, social support concepts may diminish in importance or alternatively, other constructs in the model such as perceptions of support availability, or the proportion of smokers in the network, may take on greater importance.

Testing the validity of pathways from social support to quitting smoking

One approach to examining the validity of theoretical models of support is to assess the targeted support constructs at appropriate points during the cessation attempts of smokers quitting on their own. As noted earlier, repeated measurement of support constructs was absent in the majority of studies reviewed. To determine for which pathways the evidence is strongest, smokers planning to quit, and who vary in levels of perceived available support, could be assessed at baseline for their levels of structural support indices, direct and indirect social control, motivation to quit, and perceptions of available support (both general and abstinence specific). Daily diary measures or ecological momentary assessment (Shiffman, Stone, & Hufford, 2008) could be used to collect smokers’ reports of support received from others (emotional, informational, and instrumental), how peers or a partner attempted to change the smoker’s behavior, whether the provider’s behavior was perceived as controlling versus autonomous, smokers’ solicitations of support, perceptions of stress and daily hassles, withdrawal symptoms, coping, and lapses. Providers’ reports of support delivered would also help validate smokers’ reports of support received and could determine whether the visible versus invisible support idea is relevant to smokers as well. Statistical analyses relating partner behaviors with actual smoking could also help determine whether “ironic processes” are operating for some smokers. Assessment of moderating factors should also be considered, particularly if the stress-buffering model is being tested.

Techniques such as SEM could then be used to examine whether the data are consistent with the hypothesized pathways of the model(s) being tested. Evidence for stress buffering would be obtained if for smokers who reported lower levels of perceived or received support, there is a positive association between stressors and stress responses, whereas for smokers who reported higher levels of support, the relationship between stressors and stress responses is lower or not significant. It would also be potentially valuable to determine whether professional support for quitting, such as that received from telephone counselors, plays a stress-buffering role in helping smokers quit. Perceiving that a counselor is only a phone call or E-mail away could conceivably help smokers feel less daunted or stressed by the difficulties they experience during a quit attempt, which in turn could increase the likelihood of effective coping. If this turns out to be the primary mechanism through which individual counseling increases cessation, then subsequent studies could be conducted to determine if, for some smokers quitting on their own, social network members can provide the same function and produce the same effects on abstinence rates as counselors (controlling for informational support).

Separately assessing emotional, informational, and instrumental support (both general and abstinence specific) could also help to disentangle the relative effects of each. There is an implicit assumption in the treatment literature that abstinence-specific informational support is possibly the most important aspect of treatment because it informs smokers about what they need to do to quit. It is possible, however, that at least for some smokers, emotional support received is equally important or, perhaps even more important than, advice received about what needs to be done. In one study, Zelman, Brandon, Jorenby, and Baker (1992) found that, for smokers higher in pretreatment negative affect, social support counseling was superior to skills training in helping them quit. The opposite was true for smokers lower in pretreatment negative affect. Measuring the different conceptions of support can help to disentangle their relative effects, especially if they differ for different subpopulations of smokers.

To assess support receipt or provision, some items from the Partner Interaction Questionnaire, along with other measures that have assessed what smokers find helpful and unhelpful (e.g., Coppotelli & Orleans, 1985), could be used. A recent measure, the Support Interview (Thomas, Patten, Offord, & Decker, 2004), could be adapted for this purpose. The scale was designed to assess a person’s provision of supportive behaviors to a
smoker. The authors based their items on behaviors that smokers perceived to be helpful in prior studies, specifically “praise for the smoker’s efforts at quitting, encouraging rewards, minimizing stress by avoiding interpersonal conflict and taking over some of the smoker’s responsibilities, providing information, showing empathy and concern, tolerating moodiness, and offering general problem-solving advice.” These behaviors obviously encompass all three functions of support and a measure that includes items addressing each of them also has the potential to discern the relative importance of support functions in facilitating abstinence.

For measures of other support constructs such as social integration, and direct and indirect social control, investigators could adapt measures used in other disciplines. For example, there are several measures that assess structural features of social networks, such as size and density (Cohen et al., 2000). Measures pertaining to social control of behaviors have also been developed (Lewis, Butterfield, Darbes, & Johnston-Brooks, 2004). Including all these measures in social support studies would help identify the most important support constructs for understanding how others help smokers quit.

If the underlying mechanisms between social support constructs and cessation are validated by research such as that described above, interventions that aim to change levels of intervening variables through social interactions can be designed. Repeated measurements of variables relevant to the model, as well as possible moderators, would help to determine why or why not the intervention succeeded. The methodological limitations inherent in prior studies of social support’s effects should also be addressed. The results of such research may also point to strategies that could be used to further enhance the efficacy of cessation support provided by professionals such as quitline counselors.

**Conclusions**

Although the ability of smokers to quit is undoubtedly influenced to some degree by community-level or population-level factors (e.g., smoking restrictions, advertising, culture), many smokers have been helped in quitting by receiving social support through quitlines, group behavioral therapy, or individual counseling. These treatments clearly provide high levels of emotional, informational, and instrumental support even though they are not explicitly referred to as socially supportive interventions. In apparent contradiction to these beneficial, supportive treatments are studies finding no differences in quit rates between smokers in socially supportive-enhanced treatments. The current paper argues that for research on the relevance of peer or partner social support in smoking cessation to advance, theoretical models need to be developed and tested. The roles that social support constructs may play in facilitating cessation were presented, including a stress-buffering perspective. Identifying and assessing potential mediators and moderators of relationships specified in the models could provide an even more informative account of why a particular function or dimension of social support is effective and for whom it is effective.

Increasingly, social support for health behavior change is being provided by Internet and electronic technologies (e.g., text messaging, E-mail, social networking; Portnoy, Scott-Sheldon, Johnson, & Carey, 2008). Electronic technologies can also increase assessment capabilities (e.g., ecological momentary assessment), which can be used to validate theoretical models of how social support constructs are involved in quitting smoking. This can lead to further refining and testing of theories and the ability to develop tailored cessation treatments based on a smoker’s personal profile. Tailored treatment would aim to provide the optimal type, timing, and amount of social support for a particular individual. These treatments can easily be delivered at the population level using the same advances in electronic technology described above, particularly for young adults (Ling & Glantz, 2004). With new technologies and advances in understanding how social support influences smoking cessation, the potential to further reduce morbidity and mortality from smoking is great.

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