

# Patterns of Support in an Online Community for Smoking Cessation

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## ABSTRACT

Social support offers various benefits for health and behaviour change. However, previous work has shown that individuals are typically reluctant to ask for support on social network sites, unless they can present a changed, healthier identity. To examine the relationship between stage of change and social support we conducted a thematic analysis of messages posted in a public Facebook support group for people trying to quit smoking. Our findings show that the kind of support exchanged online is related to participants' stage of change. Contrary to our expectations, supportive responses and leadership in the support group came mainly from users who just started their change process rather than people who had already changed. We discuss contributions to theories of online participation and impression management as well as implications for practitioners who seek to establish support groups.

## Author Keywords

Facebook, social network sites, social support, behaviour change, online participation, smoking cessation.

## ACM Classification Keywords

H.5.3. Information interfaces and presentation (e.g., HCI): Group and Organization Interfaces.

## INTRODUCTION

The growth of social network sites like Facebook, combined with their increasing integration into our everyday lives, has generated an interest in the opportunities presented for health and behaviour change [14, 16]. Research shows that personal networks exert a strong influence on health-related behaviours such as exercise [12] and therefore interactions with other Facebook users are also likely to be influential. People typically know their Facebook contacts in person and hence they are potentially more influential than contacts on anonymous online communities [16]. Also, anonymous online communities often struggle with getting users to log on again, whereas more than half of Facebook's currently more than 1 billion users log in daily [7].

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Despite these opportunities, people are typically reluctant to use Facebook to get support for personal concerns related to health and behaviour change. One obstacle is that people feel that Facebook users do not exhibit a culture of support, whereas users on anonymous online communities are perceived to be more empathic and more likely to respond in a supportive manner [16]. A further obstacle is that people are concerned about the impression they give to their Facebook friends when they discuss personal or sensitive issues such as health and behaviour change online [15]. But while studies of people's perceptions of Facebook suggest that they are reluctant to seek support online, little is known about how people actually articulate social support in dedicated support groups on social network sites, i.e., what kinds of support they seek and how they express it.

This paper investigates the nature of this social support, in an online health context [4, 16], through a study of a Facebook group for people attempting to quit smoking. The group was established by a smoking cessation agency, represented by one of the authors. Our focus is on the relationship between the nature of support and the anatomy of the community. By anatomy, we mean how a community is inherently structured into roles or sub-groups of different status or significance within the topic around which the community is formed. For people attempting to quit smoking, as will be described, a community is readily structured around their stage of change, from those who still smoke, to those just quit, and to ex-smokers. Our interest is in how this inherent structure influences the forms of online interaction and the kinds of support exchanged.

Through a case study of smoking cessation, we offer more general conclusions about communities and technologies. Our concern with the inherent anatomy of an online community contrasts with many other approaches that emphasise participants' degree of online interaction; for example, the reader-to-leader framework [18] which charts a continuum from only-reading to active contribution to eventually leading and structuring a forum. Further, we examine current understanding of impression management [10, 11] by showing how individuals articulate their messages to display a positive image when they disclose sensitive information. We close our paper with suggestions for practitioners who seek to establish support groups on social network sites.

## RELATED WORK

### Social Support For Health Behaviour Change

Social support refers to various forms of exchange between people to enhance their wellbeing. It can involve esteem support, intimacy, companionship and validation. Furthermore, social support can involve both tangible support and material aid as well as informational support like advice and help in problem solving [25].

Several studies document the benefits of social support for health behaviour change. For example, a longitudinal study of an online community by Maloney-Krichmar and Preece [13] reported a positive influence of online support on participants' health and wellbeing. Consolvo et al. [6] showed that social support shared through a mobile application encourages physical activity.

Interestingly, these studies have had relatively little to say about how the activities of social support might vary depending on people's stage of behaviour change. The transtheoretical model of behaviour change [19] proposes that individuals pass through a series of motivational stages before they successfully adopt a new behaviour. Wagner et al. [23] showed that individuals in later stages of change gained more value from social support than people who were merely contemplating change.

### Forms of Online Social Support

Research on online support has typically focused on exchanges within anonymous online communities. Burke and colleagues [2] found that rhetoric matters in online communities, and particularly that explicit requests increase the likelihood of getting a supportive reply. Wang and colleagues [24] showed that exposure to emotional support (but not informational support) increased the member's commitment to the community.

Health-related support communities rely on a mix of different participants. According to the reader-to-leader framework of online participation in general [18], online communities typically have a large number of readers (also known as lurkers) who make no active contributions to a community but who play an important role as an audience for the contributions of others. Some readers may become active contributors or collaborators at a later stage, but many readers also find that they get sufficient support without having to post [17]. On the other hand, online communities rely on active contributors who generate content, collaborators who cooperate with other users, and leaders who initiate new users, synthesize discussions, and take on responsibility in the group when problems occur [18]. In a health-support community, leaders and collaborators are typically long-standing members of an online community who successfully managed their own health issue and have the knowledge and experience to support others [4, 13]. Keeping users committed, attracting new users and encouraging contributions are ongoing challenges and many online communities go quiet [18].

### Social Support on Social Network Sites

Social network sites like Facebook hold potential for the exchange of social support because most Facebook users log on daily to interact with other users [7]. Furthermore, they facilitate interactions with existing social networks, like family members, friends and colleagues. Some of these contacts have a good knowledge of a person's needs and emotional state and so provide tailored support [16].

Conversely, the presence of existing social networks on Facebook can also adversely complicate social support. In everyday life people disclose personal matters selectively to obtain support, keeping them private from other people. Therefore, the social network site Google+ facilitates selective sharing of personal information. Google+ users typically segment their online personal networks according to life facets, relationship strength, or shared interests [9]. On Facebook, however, information is typically broadcast to all of these social contexts from close friends to distant acquaintances. Even a user's comments on a Facebook page related to her interests are typically displayed on the commentator's newsfeed and therefore visible to her online network. Previous work has documented the tensions that may arise from collapsed social contexts on Facebook [16], but also strategies that individuals employ to minimize these tensions and manage their impressions [11].

Several studies show that health is a particularly sensitive issue that people do not wish to disclose on Facebook. Morris et al. [15] found that while people regularly asked questions on Facebook, they were reluctant to raise or respond to health questions, because they were seen as too personal for such a setting. Newman et al. [16] showed that while some people desired support from close ties on Facebook, they preferred to disclose health information to anonymous online communities. Nevertheless, some interviewees indicated that they might present a healthier identity on Facebook in the future.

In summary, health-related social support on social network sites like Facebook is desirable because it is a frequently used and familiar form of social interaction for many people. Yet it is complicated due to concerns about impressions given to an audience including strangers but also close social contacts. While much is known about people's perceptions of Facebook for behaviour change, very little attention has been given to the forms of support that actually take place on Facebook and how this may be influenced by a person's own state of behaviour change. Hence, our aim here was to examine how people actually articulate support on Facebook: *what* kinds of support they exchange at different stages of change and *how* they express it in light of the diverse audiences online.

## THE STUDY

We conducted a qualitative case study of a particular health behaviour change group on Facebook. We collected all of the comments posted during the first six months of a Facebook page established to help people quit smoking cigarettes and analyzed them to identify the stage of change

for each group member and the kinds of support exchanged. The numerical data in this paper is intended as descriptive evidence about the nature of the online group rather than as a means of testing relationships. Hence we do not report any statistical tests. We are following Yin's [26] position on case-study data: that it is analytically generalizable. This implies that the patterns of online behaviour observed here are in principle comparable with other situations. In this way they contribute to the larger research effort of understanding online interaction.

### **The Case of Smoking Cessation**

Smoking cessation constitutes an interesting domain for the study of online social support, because while social support is a critical success factor for quitting, the exchange of support is typically adversely affected by concerns about failure. Studies of specialized online communities document the significance of social support for quitting [3, 4]. Smoking cessation researchers further highlight that support from social network sites like Facebook hold potential benefits to dramatically reduce the number of smokers [5]. However, smokers are generally reluctant to share their quit attempt with other people due to the high risk of failing and the potential embarrassment associated with failure [1].

### **SC's Facebook Page**

The Facebook page was created by SC (anonymized) a non-profit organization involved in the promotion and research of smoking cessation. SC offers various services to help people quit smoking, such as telephone counseling, courses, a website and an SMS service.

SC's Facebook page was established in late 2011 to facilitate peer support amongst people trying to quit smoking. At the time of this study the Facebook page had 6127 users. A large part of the user base was recruited through a Facebook advertising campaign over 3 weeks in January 2012. The campaign included different advertisements addressed to current smokers, people who were trying to quit, and people who lived smoke-free.

SC's Facebook page was publicly visible. This meant that any individual could read postings in the group, even without a Facebook account. Unless group members restricted their Facebook settings, any comment on the page was also displayed on their newsfeed and therefore visible to their Facebook friends.

### **Data Analysis**

Our findings are based on a thematic analysis of all 357 posts on SC's Facebook page over the 6 months leading up to 5 April 2012. These posts consisted predominantly of text-only comments, but they also included links, photos, and videos with captions. While 'Likes' may also be seen as a form of support, we excluded them from our analysis because we had no information to classify the stage of change of these users.

The first author was a reader in the Facebook group over 5 months to develop an understanding of the types of

exchanges occurring. These observations formed the starting point for a thematic analysis of all posts in the group.

The thematic analysis consisted of several rounds of coding conducted by the first two authors. Author three and four coded excerpts from the data using the emerging coding scheme to check for consistency. During the first round of coding we read through all posts to identify different kinds of support and to classify the stage of change for each post. The majority of posts contained explicit statements about the user's stage of change (e.g., "2 weeks today without a cigarette"). The remaining posts were assigned based on contextual information such as a user's previous posts and the topic of a conversation thread. 43 posts were unclassifiable because they contained no information about the users themselves or they were ambiguous about how long ago they quit. Users were assigned according to the assignment of their posts. Only 4 of the 180 users posted at multiple stages of change, e.g., both before and after quitting. These 4 users were assigned to the stage at which they posted the majority of their comments.

In consecutive rounds of coding we used the software NVivo to refine our coding scheme and to analyze potential differences between users at different stages of change. We produced matrices to analyze differences in the number of posts of different kinds of support, rhetorical strategies, audiences, and levels of engagement. Furthermore, we examined our data for potential biases. The number of posts amongst the 180 active contributors was rather low (average of 1.7 comments per user) and we did not identify any users that strongly influenced the group through large numbers of posts or long-term participation.

Finally, we used Facebook's Page Insights to examine the amount of reading (lurking) in this group. SC's page was followed by 6127 users. Their posts were viewed by between 1427 and 2540 unique users. Only a very small fraction of these users (between 1.8% and 4.4%) liked, shared or responded to SC's posts. Unlike the active contributors, however, we had no information about the stage of change of people who remained only readers.

The following section offers a rich description of how users at different stages of change articulated support on Facebook. We use numerical data as well as direct quotes from the Facebook page to support our observations. However, we removed any identifying information in direct quotes and made minor modifications to their wording and punctuation to protect the group members' privacy.

### **FINDINGS**

We now describe the behaviour of the 180 people who, as well as SC (anonymized), posted comments in the Facebook group. Table 1 shows a breakdown of the number of users in each stage of quitting and the number of posts per stage. The stages of quitting used in this paper are a modified version of the transtheoretical model [19] used by SC to classify people calling its telephone counseling service. Smokers who were preparing to quit were either

Expressed stage of change	Users	Posts	Posts/user
SC	1 (0.6%)	62 (17%)	62
Preparing	12 (7%)	24 (7%)	2
Just quit	23 (13%)	73 (20%)	3.2
Staying quit	26 (14%)	38 (11%)	1.5
Ex-smokers	59 (33%)	78 (22%)	1.3
Slip-up/relapse	9 (5%)	13 (4%)	1.4
Unmotivated	5 (3%)	11 (3%)	2.2
Never smoked	9 (5%)	15 (4%)	1.7
Not classifiable	37 (20%)	43 (12%)	1.2
<b>Total</b>	<b>181 (100%)</b>	<b>357 (100%)</b>	

**Table 1. Nos. of active users expressing each stage of quitting**

contemplating or already committed to an attempt. Going beyond the transtheoretical model, SC distinguishes between people who just quit within the last month and people who were trying to stay quit (in month two to six of their quit attempt). These groups differ in the frequency as well as the intensity of their cravings for a cigarette. Ex-smokers were people who had quit more than 6 months ago and typically felt safe from relapsing. We classified people who had temporary slip-ups or who relapsed and started to smoke again as a separate group, as they were in a transition period where they worked through a setback.

Table 1 shows that unmotivated smokers who had no intention of quitting in the foreseeable future also posted in the group. Their posts were largely unsupportive of the quit attempts of other users, but some of them initiated engagement by other users. Furthermore, a small group of people who had never smoked posted in the group, primarily to encourage others to quit. 43 posts were not classifiable because they contained no information about the users themselves or the information was ambiguous. Overall, table 1 shows that the majority of posts came from people who had either just quit or who quit a long time ago.

Table 2 shows the number of different kinds of support messages posted by users at various stages of change. These

numbers do not match with table 1 because table 2 includes only supportive comments, not off-topic comments or critical remarks. Furthermore, longer comments were coded several times for different kinds of support. Prominent types of support exchanged were advice and motivations to quit. However, users also posted indications of committing to a quit attempt and they also vented about difficulties associated with quitting. They encouraged other users to quit, presented achievements and admissions of failure. Table 2 shows the overall distribution of comments, but it lacks details like whether people sought or offered a particular type of support. These details as well as larger trends in the articulation of support at different stages of change are now discussed for each type of participant.

### SC (anonymized)

SC played a key role in the group, because the design of Facebook pages highlights comments from the page owner, whereas comments from other users are only displayed in a small box on the side. SC posted 62 comments to prompt users to exchange support and to offer their own support.

### Prompting Support

Over the course of the six months SC posted 15 comments on the Facebook wall to prompt responses from other users. Ten comments linked to newspaper articles, smoking cessation websites and videos. The most popular of these links was a YouTube video about a smoker who developed a life-threatening disease. This video led to 24 comments from users at various stages of change that expressed emotional support and encouragement.

However, overall these links to videos and websites generated fewer comments than comments that addressed users at a particular stage in their quit attempt. Out of the five comments addressed to users at a particular stage of change, the one that received the most responses (24) was addressed to ex-smokers. It invited them to share their personal story in order to offer advice and motivation to other users who attempt to quit.

*“Happy Monday! Congratulations to all those who have started off the year by quitting smoking! We'd love to hear what has helped you quit and if you have any words of motivation for those thinking about quitting.”*

Expressed stage of change	Admission of failure	Commitment to quit	Vent difficulties	Encouragement to quit	Advice on quitting	Achievements	Motivations for quitting
Preparing	0	9	5	4	6	0	1
Just quit	3	7	20	23	19	20	10
Staying quit	0	0	4	9	11	19	13
Ex-smoker	1	0	8	19	34	35	28
Slip-up/Relapse	13	4	4	1	3	0	1

**Table 2. Nos. of different types of support (or need for support) posted for each expressed stage of change**

### **Offering Support**

As the owner of the Facebook page, SC played a critical role in offering supportive responses to users. SC posted 36 comments to ensure that everyone who disclosed personal information about his or her quit attempt felt valued and received a supportive response.

*User 1: "This week is my week - fingers crossed."*

*SC: "Good Luck [user 1]. Don't forget to check out our website for loads of information on how to quit. [URL] Let us know how you're going."*

Beyond the benefit for a particular user, SC's responses were important for the entire group, because they signaled to other users that they were also likely to receive a supportive response. Furthermore, the combination of encouraging tone with instructive content in SC's comments served as a template for other users to respond and offer support, but it may have also inhibited other members of this group from having to respond.

### **Preparing for Quitting**

The first stage of quitters were users preparing for quitting. Some people in this group had already made a commitment to quit at a particular date; others were merely contemplating quitting at some time in the future. Only 12 users at this stage posted comments in the Facebook group. They discussed advice (6 comments), emotional support (4) and some even made a commitment to quitting (9).

#### **Reading rather than Asking for Support**

The following comment is an example of someone who is preparing for quitting and asks others for their advice. *"Well done to those that have quit smoking, and a pat on the back for those that are in the process [...] I want to give up smoking [...] We are looking at trying for a baby sometime this year so I would love to be smoke free by then. Those of you that have quit or are in the process how did you start the journey?"*

Besides encouraging other group members, it indicates a commitment to quit and it asks advice from a group of individuals who either went through this process in the past or who are going through it now. However, only two other questions were posted. All other posts in this category were statements of advice that users intended to take on board, like trying out a particular method of quitting.

#### **Indicating Commitment**

Smokers are typically aware of the high risk of failing in a quit attempt and hence they are often reluctant to let other people know that they are attempting. Nevertheless, nine comments in the Facebook group showed a commitment to a quit attempt on a specified date.

*"I have been smoking for 7 years, but eventually enough is enough. I start my quit process tomorrow."*

Publicly indicating commitment might be beneficial to get support but it also adds risk. If a quit attempt fails, users may feel they have not only let themselves down but also publically embarrassed themselves. Only one user who signaled commitment in the Facebook group continued to post at a later stage in his quit attempt. Other users may have been smoke-free but reluctant to post before they felt they had quit successfully, or they may have relapsed.

### **Just Quit**

We classified users as 'just quit' when they had quit smoking cigarettes less than one month ago. Support networks can help a person avoid situations that make them crave for a cigarette and offer support during tough times. We found 73 comments from 23 users who had just quit. These users posted about their commitment to change (7) and their achievements (20), but also to vent about their difficulties (20). They exchanged informational (19), motivational (10) and emotional support (23), often to help others rather than to seek help. Several users stepped up as leaders to fend off criticism from unmotivated smokers.

#### **Sharing Achievements and Venting**

Many users in the just quit group posted on the Facebook page to share an achievement (20 comments). Some comments were plain expressions of their successes, like, *"day 5 smoke free for me, yay!"* Some users combined their achievements with advice on coping strategies and indications of their emotional state.

*"I'm 2 weeks today without a cigarette and still going strong thanks to nicotine patches! [...] It's been a really tough journey and I know it isn't over for some time yet!"*

The comment above indicates that quitting is hard. In fact, one critical form of support offered by the group was to give its members a place to vent, particularly for those who had just quit (20 comments). They vented about difficult social situations with other smokers, habits like smoking after a meal, and the desire to smoke to cope with stress.

*I want to smoke! Determined not to have one though. Just broke up with my partner of three years. Moving home to my parents at the age of 38.... yay me!"*

#### **Helping Others to Help Themselves**

Users who just quit and contributed comments showed high levels of engagement with other users. We found six responses to specific members about advice on quitting and seven responses to encourage a specific user. Users at all other stages combined (except for SC) only responded three times with advice and six times with encouragement. The following example shows a response from someone who just quit (user 2) in response to a call for help (user 1).

*User 1: "I quit 11 weeks ago but lately have been tempted and succumbing to the temptation. My partner smokes and sometimes leaves his cigarettes lying about. My friends smoke too and I'm just so weak. Any advice welcome :)"*

User 2: “Hang in there. I quit six days ago and I also have a lot of stressors and my partner smokes. However I just had my 40th birthday and that has given me the determination to become fit and healthy. [...] Sending you positive thoughts.”

Such responses are noteworthy as they show an increased level of participation. Rather than merely contributing their own stories, these users actively collaborated with others to quit smoking. The quote shows that users who just quit could empathize with other people’s difficulties because they were at a difficult stage of change themselves. Helping others can also be motivating for one’s own quit attempt.

#### **Spontaneous Leadership**

Several users who just quit took on the role of spontaneous leaders of the Facebook group to fend off unsupportive comments. The following comments show how a criticism from a smoker who expressed no desire to quit (user 1) led to the first two comments in the newly established Facebook group where users (user 2 & 3, both at the stage of having just quit) spoke on behalf of the group to defend it. We describe this leadership as spontaneous, however, because it was enacted in the moment of posting rather than reflecting an ongoing disposition. Neither user 2, user 3, nor any other user continued in a leadership role.

User 1: “What does it matter to you if people smoke or not? People die from car accidents or falling off ladders. I don’t hear you wanting them banned.”

User 2: “Yes, you have a right to smoke, but this page is for people who want to quit and need help and support. Simply leave the page if it bothers you.”

User 3: “Hey [user 1], you smoke, that’s your choice, we have all quit or are trying to quit and that’s our choice too. [...] It’s hard, but for you to have even come to this page says to me, that deep down you really do want to quit. At least you are thinking about it, which is a start :)”

#### **Staying Quit**

We classified users as ‘staying quit’ when they quit more than one month and less than six months ago. This group had different needs to users who had just quit, because after a several weeks without cigarettes the number of cravings typically decreases. Users from this group posted 38 comments. They rarely seemed to vent (4 comments) and they exchanged little advice (10) and emotional support (8), but they increasingly shared achievements (19).

#### **The Hardest Time is Over**

We found very few comments in this group about the difficulties associated with quitting. While people who just quit posted 19 times in the Facebook group to vent about difficulties, people who were staying quit mentioned difficulties only four times, and only one of these comments was about recent difficulties. The remaining three comments addressed difficulties from the past that they had successfully overcome, as in the comment below.

“I quit smoking 2.5 months ago. I don’t even miss it now. I don’t even think about it. It was HARD. The biggest demon is inside your brain, telling you, showing you mental images of cigarettes even. But it passes. I had restless legs on about day 4, but it passes. I had terrible mood swings (I didn’t kill anyone) but that too passes. [...]”

#### **Increase in Achievements**

Half of the posts in this group (19 out of 38) presented a personal achievement, which indicates that users from month two to five in their quitting process were in a transition from the immediate difficulties associated with quitting towards becoming a successful ex-smoker.

Five posts solely pointed out the achievement in terms of the time without cigarettes. For instance, one user posted: “Almost 5 months now without a cigarette. I’m very proud of myself.” The remaining 14 comments combined achievements with short descriptions of personal experiences that contained advice as well as motivation for quitting. For example, the following comment combined advice with achievements, but it also stressed the tentative state of users at this stage of change. Although this user had been smoke-free for several months, she did not consider herself an ex-smoker who is safe from a relapse.

“Sugarless gum and playing words with friends helped me a lot. Been 12 weeks now but still crave sometimes, however I am proud of myself, after all I did smoke for over 35 years... still taking it a day at a time.”

#### **Ex-Smokers**

We classified people who were quit for at least six months as ex-smokers. Ex-smokers are typically not concerned with the challenges of earlier stages and feel safe from relapsing. They were the most visible group on this Facebook page with 78 comments from 59 users. They discussed their motivation to quit (28 comments), presented achievements (35), gave advice (34), and encouraged others to quit (19).

#### **Reinforcing Motivations to Quit**

In sharing their experiences about quitting, ex-smokers highlighted a variety of motivations to quit smoking. Ten users faced a health scare like cancer or stroke, or they were close to someone else whose health was affected by smoking. A second group of ex-smokers framed their motivation as being driven by the benefits of quitting (18 comments), such as saving money and improved health.

“My husband and I quit together about 4 years ago. We had tried it before and he found it very difficult, for me it was a must due to my worsening asthma. [...] We are both determined to stay quit as my health has improved dramatically and we are saving so much money as well. Best decision we ever made, and it was together that we managed to stay quit as we helped each other through.”

The comment above further highlights the social influence in quitting. Three users managed to quit smoking with the

support from another person that also quit. Four users stated their main motivation to quit came from another person, like to be a good role model for their children. These posts referenced people in their immediate environment, but no one commented on support received from an online group.

#### **Once-Off Advice Based on Personal Achievements**

Ex-smokers contributed by far the most achievements to this group (35 comments). Seven posts were presentations of achievements, like posts about quit anniversaries: “Wednesday just gone was a year for me :)” The remaining posts of achievements also included advice. The comment below is a typical example of sharing advice (about medication), which starts with the achievement and closes by encouraging others to quit as well. What is interesting about this comment however, is the reflexivity in the comment. It contains an ironic statement about self-praise combined with a ‘lol’ at the start, and it acknowledges the diversity of problems that smokers experience.

*“I’ve been smoke free for 18 months (I know-go me! lol) I went on Chantix, and it worked for me but what really did the trick was making it MY choice to quit. I was only on Chantix for about 3 weeks and followed their words of wisdom. You have to be 100% ready to give up. Good luck to you all! Warning, everyone is different. So it is up to each person which way they want to go.”*

Despite the wealth of experience amongst ex-smokers, only one of them addressed a specific user in his comment. All other posts of advice (33 out of 34) were accounts of personal experience addressed to an imagined audience of people trying to quit. Typically, they were one-off posts, as indicated by the overall low number of comments (1.3) per contributor in this group.

The recurring slogan “If I can quit, anyone can quit” was a further indicator for the focus on the self in the exchanges within this group. We found ten such statements (or slight variations), six of them from ex-smokers. These comments were well intended, because they highlighted that while a person may doubt his or her ability to quit, that a successful outcome is feasible. However, this slogan also shows that users typically framed their posts as broadcasts to an impersonal imagined audience of quitters rather than as responses to a particular user.

#### **Slip-Ups and Relapses**

This group consisted of users who tried to quit but relapsed. We classified them as a separate group, because they were in a transition period where they evaluated their change in light of a setback. Five users commented on their slip-ups, which meant they were still trying to quit. Four users talked about a relapse, which meant they were smoking.

#### **Share Slip-Ups to Indicate Commitment**

One person reported a slip-up while consuming a cigarette, and four users commented on their slip-up retrospectively.

As noted from related work, there is reluctance to express failure in a semi-public environment with different social circles like Facebook. These four users ended their posts on a positive note with the intention or even the achievement to stay smoke-free. Framed in this way, admitting a temporary setback to the Facebook group sent a signal of strengthened commitment.

*“I am on day 7 as a non smoker. I slipped yesterday and had a single puff and it was gross. [...] For me the hardest part of the day is after dinner, which is the cigarette I enjoyed the most. The rest of the day is not a problem.”*

#### **Impression Management During Relapse**

Our analysis identified eight comments from four users who had relapsed back to previous levels of smoking. While one user presented her experience as failing openly, three others presented the episode and themselves in a positive way. One user admitted failure but ended on a positive note, stating that she intended to quit again in the future. Two users expressed their failure in a way that hid it from Facebook users who may not be familiar with the context of smoking cessation. Their comments did not mention the words ‘smoking’ or ‘quitting’ or any other word that may indicate failure. Instead they referred to specific medication to treat their addiction. These comments made sense in the context of the support group. However, friends who saw these comments on their newsfeed may not have interpreted them as referring to a relapse.

*User 1: “Tried Chantix, still the same. What should I do?”*

*User 2: “I tried Chantix too but needed to stop due to extreme nausea.”*

## **DISCUSSION**

The findings of this study offer a rich picture of the kinds of support for health-related behaviour change that can occur in a social network site. Firstly, going beyond early research that suggests people are reluctant in this context [15, 16], we see here that Facebook is capable of hosting supportive exchanges. But secondly, the present findings suggest that people differ in the ways they exchange support, depending on their personal stage of behaviour change. Similar to studies of social support in offline settings [23], the majority of supportive comments in this study of Facebook came from individuals at later stages of change. However, the relationship was not a simple linear increase of participation with experience. The number of posts as well as their content varied in subtle ways between users at different stages of change.

The largest number of comments came from people in the last stage of change who successfully quit smoking. These users displayed their achievements, and at the same time, they offered advice and encouragement for others. These observations are consistent with studies of online discussion forums dedicated to behaviour change, where the majority of posts typically come from users who successfully

changed their behaviour [3, 4]. They are also similar to findings that Facebook users might share their behaviour change only after it was successful [16].

Perhaps more surprisingly, the second largest number of contributions came from individuals who had just started their quit attempt. Users who had just quit commented about difficulties in the change process, even though related research suggests that people typically discuss their difficulties, particularly in sensitive contexts like health, either in private or on anonymous discussion forums [15, 16]. Furthermore, these users made a commitment to change on Facebook, whereas previous work suggests that people typically choose to keep behaviour change private to avoid embarrassment if they failed to change [16, 20].

Contrary to suggestions from previous work [16], some users even posted their slip-ups and relapses. These posts suggest that the perceived value of social support through the Facebook group outweighed concerns about potentially negative impressions given to other users. However, as we will discuss further below, these users applied a variety of strategies to maintain a positive image in front of the group and their diverse network of Facebook friends.

Users at other stages of change were less visible on the Facebook page. Those preparing to quit discussed advice, but rarely asked for advice or any other form of support. As indicated in related work [16], these users may have been cautious about making a public commitment to change as well as about giving an impression of lacking knowledge. Users in month two to six in their quit attempt presented fewer difficulties than people who just quit, but they were also still tentative in presenting their achievements, possibly because they did not feel safe from relapsing.

Finally, in contrast to discussion forums set up by health organizations [4, 24], the exchange of support in this Facebook group relied on prompts and moderation from SC rather than on contributions from its members. This was in part a Facebook artifact, because the current design of the page newsfeed presents only posts of the page owner (and responses to them), whereas posts from other users are only displayed in a box on the side. It was possibly also a result of the relatively young age of the support group, and its members may take on more of SC's tasks in the future.

### **Levels of Supportive Engagement**

A second theoretical contribution of the study is to highlight trends in the relationship between stage of behaviour change and level of supportive engagement. Extending the reader-to-leader framework of online engagement [18], our analysis pointed to more ad hoc forms of participation including spontaneous leadership.

Similar to many other online communities, the data from Facebook's Page Insights showed that more than 95% of the users in this Facebook group were readers (lurkers). Unlike on discussion forums, where users have to search for

new posts, our cohort had convenient access to posts through Facebook's newsfeed. While our dataset offered no insight into the needs of readers, related work suggests that these users may have found sufficient information in other people's comments and therefore felt no need to post themselves [17]. Furthermore, the large proportion of readers aligns with related work that suggests individuals typically do not publicly discuss health behaviour change on Facebook until it is successful [22]. Hence, reading could be particularly useful at early stages when users are preparing or starting to change and therefore benefit from advice and emotional support from other people.

Most active users were contributors who offered advice and motivational support, and only few users were collaborators who offered advice and encouragement in response to particular individuals. In contrast to previous work [4, 16], however, the collaborators in our study were people who just started their change process rather than people who had successfully changed. The findings showed that users who had just started their change process could empathize with the challenges that other individuals experienced. Possibly, helping others also gave them motivation to stay on track.

Finally, most leadership work came from SC, the organization that established the Facebook page. SC continually sought to encourage engagement, initiate new users, and moderate discussion. However, our study also showed spontaneous leadership by individual users, particularly in response to criticisms of SC by users not motivated to change. Again, these spontaneous leaders were typically people who just started their behaviour change. Their leadership was ephemeral, however, and they posted very few comments overall in the Facebook group. This phenomenon of spontaneous leadership seems different from discussion forums, which typically rely on a stable core of long-term community members as leaders [13, 18]. Ongoing leaders may still emerge in this group as the group matures. However, Facebook's newsfeed and notification features may also afford spontaneous participation whereas discussion forums require ongoing participation to develop an identity and to keep an overview of all posts.

### **Impression Management and Social Support**

Our findings suggest that although group members sought support from their peers, they were also concerned with giving a positive impression to the group. Their comments in the group were also visible on their friends', family's and colleagues' Facebook newsfeeds, which further complicated their participation in the group. Hence, the third contribution of this study is to enhance current understanding of impression management on social network sites by highlighting different strategies of disclosing personal matters and expressing support.

The majority of posts were articulated as a personal report, rather than as a question or a comment to encourage a dialogue with another group member. These self-oriented

contributions were particularly pronounced amongst people at the last stage of change. The recurring slogan “If I can quit, anyone can quit” further highlighted that their posts were addressed to an imagined audience of other users rather than a particular group member. This focus on personal experiences could be seen as a reflection of the ways in which people use Facebook more generally, which is typically to keep in touch with other people and to self-present through status updates and photos [8]. However, it differs from online health forums that are characterized by high levels of dialogue between users [13, 21].

A related observation was that very few users asked questions in the group. The low number of questions is surprising, given that articulating a comment as a question is more likely to yield a response [2]. The large number of readers in this study suggests that many users may have found some support in existing posts. As suggested by prior work, such users may have been concerned about giving an impression of lacking knowledge or needing support [22], or they simply regarded their health as a personal issue that they did not want to discuss publicly on Facebook [15].

Despite concerns about impressions given to other Facebook users, some users expressed difficulties and even failures in their attempts to change, whilst others disguised outright statements of failure by choosing words that would not be understood by other Facebook users unfamiliar with the context. Unlike related studies of Facebook [11], we found this to be the result of collaboration between different users rather than an individual’s strategy. A more common strategy was to openly express failures but to give them a positive twist by pointing out achievements or by indicating continuing commitment to change. This strategy suggests people’s desire to present an idealized image of themselves online [10]. However, it may also be indicative of a change in people’s perception of Facebook. In contrast to the previous work that suggests that people did not perceive Facebook as a place to post personal and sensitive content because it would be met with sarcasm and a general lack of empathy [16], this study showed that being able to show an achievement may make it easier for these users to disclose personally sensitive issues on Facebook.

### **Implications for Practice**

Our findings offer implications for online community designers, developers, managers, and healthcare professionals who seek to establish and manage sustainable support groups via Facebook.

Our findings show a clear need to address users at their particular stage of change. Similar to other health interventions [19], support through social network sites benefits from targeting groups according to their specific needs and motivations. A related finding is that prompting for personal experiences at a particular stage of change appeared to generate more engagement than links to relevant information. These prompts were particularly

successful when they gave the group members an opportunity to indicate their achievements, regardless of how tentative these achievements were. One strategy to quickly generate discussion is to prompt people who successfully completed a change to talk about their achievements and to offer advice and motivational support.

Contrary to indications from prior work [16, 20], our findings show that people can be prompted to carefully disclose difficulties and even setbacks to obtain support on Facebook. Allowing people an opportunity to share preliminary achievements appears to facilitate disclosure. A prerequisite is that members perceive the group to be safe and supportive. Hence, moderators need to ensure that every comment in the group receives a supportive response. This gives them an opportunity to model a supportive culture within the group that other members can follow.

Online support groups can garner valuable support, but the present case study suggests that these benefits are limited. On the one hand, we found that concerns about impressions given to different audiences on Facebook (i.e., the support group versus personal networks) complicated and potentially limited how people sought support. As indicated by Kairam et al. [9], features to segment online audiences and to selectively share personal information might alleviate these concerns. On the other hand, the low number of responses to many users also indicated that responses may not offer sufficient support to help an individual struggling with behaviour change. This could be due to the relatively small number of users on this Facebook page. A larger group may see increased interactivity and support between users. However, at current levels of interactivity, moderators need to remain vigilant, and remain open to directing individuals to other avenues of support.

### **CONCLUSIONS**

This paper presents a detailed case study of an emerging phenomenon: the articulation of health-related social support on social network sites such as Facebook. Despite strong evidence that individuals are generally reluctant to discuss personal issues like health in the context of Facebook [16, 22], this study has demonstrated that some individuals will exchange advice, seek emotional support, and even disclose failure in this online setting. Furthermore, contrary to indications from other online and offline settings [4, 16, 23], supportive responses and leadership came from users who just started their change process rather than people who had successfully completed it. Overall our findings extend current understanding of social support, level of engagement and impression management on social network sites. Furthermore, they offer potential guidance to organizations seeking to promote healthy lifestyles via support groups on social network sites.

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