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**Title:** Usage of Facebook- and Anonymous Forum–Based Peer Support Groups Online and Their Influence on Perceived Social Support Types in Weight Loss

**Year:** 2016

**Version:**

**Please cite the original version:**

Taiminen, H., & Taiminen, K. (2016). Usage of Facebook- and Anonymous Forum–Based Peer Support Groups Online and Their Influence on Perceived Social Support Types in Weight Loss. In Proceedings of the 49th Hawaii International Conference on System Sciences (HICSS 2016) (pp. 3094-3103). IEEE Computer Society. Proceedings of the Annual Hawaii International Conference on System Sciences. <https://doi.org/10.1109/HICSS.2016.389>

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# Usage of Facebook- and Anonymous Forum–Based Peer Support Groups Online and Their Influence on Perceived Social Support Types in Weight Loss

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## Abstract

*This paper contributes to the discussion on health behavior change support systems by examining one of the persuasive software features, social support. The paper studies the influence of structural social support on functional social support types in the online environment. Specifically, the paper examines the frequency of using two different kinds of online social platforms (online forums and Facebook groups) that are used to facilitate peer social support in weight loss and their influence on perceived functional social support types (emotional, informational, and instrumental). The results show that frequent use of Facebook based support peer group facilitates perceived emotional, informational, and instrumental support, whereas frequent use of online forum based peer support group facilitates emotional and informational support but much less than Facebook support group usage does. Thus, modifying the support platform makes it possible to influence perceived functional social support.*

## 1. Introduction

Different online weight-loss training programs have become increasingly popular, as they provide individuals with tools to change their eating and exercising habits and adopt new, healthier lifestyles. These kinds of technology-mediated programs targeting health behavior change can be considered health behavior change support systems (HBCSSs). A behavior change support system (BCSS) is “a socio-technical information system with psychological and behavioral outcomes designed to form, alter or reinforce attitudes, behaviors or an act of complying without using coercion or deception” [27, p. 1225]. The idea of BCSS is based on persuasive technologies [see e.g. 8] and emphasizes the role of the technological platform in the behavioral change process [27, 30].

The persuasive system design (PSD) model provides a useful starting point to evaluate and design

BCSSs by offering a description of the elements that make BCSS effective [26, 27]. The PSD model classifies persuasive software features into four main categories: a) primary task support (supporting the user’s main task), b) dialogue support (supporting the interaction between the user and the system), c) system credibility (the credibility of the system is seen to influence its persuasiveness), and d) social support/social influence (the system motivates users by leveraging social influence) [see 21, 22, 27, 28]. In this paper, we examine HBCSSs by focusing on one of the PSD features: social support, particularly its modification and existence in online social platforms in the context of weight loss.

Social support is an exchange process between at least two individuals [30, 34] aiming to enhance the well-being of the recipient [13, 30]. In the BCSS context, social support refers to computer-mediated user-to-user interactions [see 27]. Its role in the PSD framework is to motivate users to use BCSSs [see e.g. 21] and to motivate users in their behavior change attempts. Several studies have found that social support facilitates weight control [see e.g. 7, 10, 40]. Involving support partners, especially successful weight losers among peers, has been shown to be related to successful weight loss [10, 40]. However, support partners appeared to be beneficial only when the partners themselves lost weight [10].

Despite its importance, not everyone has access to peer social support in their current networks because it requires the existence of social relationships, whose structure, strength, and type determine the type of social support available [39]. Online social support provides a potential solution to this problem. People are increasingly spending their time online and communicating via digital tools. Different kinds of online support groups (OSGs) help bring together people who struggle with similar health issues [37]. Within these online groups, people seek information and advice, share emotions [33], find people in similar kinds of situations with whom they can emotionally identify [4], and motivate each other to learn and adopt new attitudes and behaviors.

Although some online weight loss programs allow members to use different kinds of social media tools to share and receive social support, little is known about how the use of these tools influences the perception of specific types of support [16]. It remains unclear what kinds of online platforms are the most suitable for providing peer social support. Furthermore, the social support literature has mostly focused on anonymous online communities [30]. As Oh et al. [29] noted, more research is required to determine the specific functions of Facebook or other social media that would likely lead to benefits for patients. Social networking sites are one of the platforms that have recently been emphasized in persuasion systems research [27]. In addition, understanding the different kinds of online communities would assist healthcare professionals in evaluating, building, and manipulating social support for weight loss [17].

Social support includes two aspects: structural support and functional support [see e.g. 13, 15, 18, 20]. Functional support is more strongly related to health and well-being, although weight loss interventions typically manipulate structural support [36] because it is easier. However, evidence has been found that modifying structural support can influence functional support [16, 18].

Thus, this paper aims to examine the influence of structural social support on functional support in online training programs focusing on weight loss. More specifically, the paper looks at the usage of two different kinds of online peer support platforms—anonymous forum and Facebook group—in the same online weight loss program and examines how their usage influences perceived functional support types.

## 2. Theory

### 2.1. Structural social support online

Following the social exchange theory, structural support refers to a structure where an interactive process occurs, such as social networks [20]. In practice, this means the sources of support (e.g. spouse, family, experts, friends, peers) and “individuals’ exposure to and degree of embeddedness within a network” of social contacts [13, p. 69].

OSGs can be perceived as a special type of structural support and a source of functional support. In general, online social support is perceived as similar to face-to-face social support but offers unique aspects of the online environment, such as convenience, anonymity, and nonjudgmental interactions [17]. Chung [4] concluded that people who were dissatisfied with the support from their offline contacts would

more likely choose online support. This preference was more common among those who were generally able to build deeper social relationships in OSGs. Participating anonymously in computer-mediated support groups provides a sense of safety [41]. Bugshan et al. [3] noted that social media might be especially helpful for those who would not be comfortable discussing particular health issues with their doctor. For instance, obesity can cause stigma and limit mobility, which makes weight losers favor the text-based, anonymous, and network-expanding benefits that online communities provide [18].

An OSG can be based on the intervention provider’s website (e.g. Spark People Community, Weight Watchers). The intervention provider’s website can offer a platform to an OSG of a particular theme, where one can create one’s own profile and act anonymously. Often the communication is occurring via online forums with limited options to interaction.

An OSG can also be established in already existing social media channels such social networking sites like Facebook. Social networking sites are social media channels with high self-presentation [19]. This means that these sites are meant for people who can engage one another on a personal level. The downside of social support channels with high self-presentation is that totally anonymous communication is often not possible in public media channels. This might even weaken the interest for social support from these channels, as people may want to separate their everyday lives from the social support group [30]. Furthermore, communication in these kinds of social media channels might be richer compared with that of text-based anonymous online forums because the former offer various possibilities to communicate besides writing (e.g. liking, posting pictures, and sharing content).

Besides the anonymity and technical features of these platforms, how people use these platforms in their everyday lives is important, as the effectiveness of communication depends on both the sender’s and receiver’s familiarity with particular communication medium codes and conventions [2], as well as their utilization of and exposure to the communication. The usage of different platforms makes different online support sources effective. Channels are useless if they are not used by the target group of the communication [see e.g. 38], as the benefits provided by the communication would never materialize. In the context of eHealth services, the networking channels must be straightforward to use and fit into people’s everyday lives [12]. For example, if the community exists in a platform where the user needs to sign in separately, this would take extra effort, which might decrease the usage of and exposure to supportive communication.

Therefore, social networking sites that are already being used, such as Facebook, may offer great potential for the exchange of social support in already existing infrastructure [30].

The above discussion shows that both pros and cons exist in relation to the nature of different online social groups and their delivery of social support. Hence, differences in the platforms' anonymity, the channels' level of self-presentation, the individuals' familiarity with the channel, and the channels' connectedness to the individuals' everyday lives may influence the perceived functional social support.

For instance, in the study of Hwang et al. [16], social media use (the use of an anonymous online forum or community member profile page or blog) predicted encouragement support (motivation, congratulations) but not support in terms of information (advice, tips) or shared experiences (belonging to a group). Their other study in the same community found that emotional and informational supports were related to the use of social media tools [18]. The differences were explained by the differences in the eligibility criteria and the methods for assessing different functional support types, which made the results impossible to compare. Despite the mixed results, the frequency of use is related to the influence on perceived functional support types. Furthermore, regular engagement [27] and usage continuance [21] are important factors in making BCSSs meaningful.

Therefore, in this paper, structural support online is defined and operationalized in terms of the channels (sources of peer support, namely online forums and Facebook groups) and the frequency of using these channels [see also 18]. The paper also suggests that the frequency of using the support channel influences the perceived functional support types.

## 2.2. Functional social support online

Functional support refers to the subjective perception of the quality of support received (i.e. the exchange activities) [13, 20]. Although the definitions of functional social support vary, scholars agree that it is a multi-dimensional construct [15, 23]. Interpretations of the functional social support construct differ, but the meaning of its dimensions remains mainly the same; only the terminology is different [15, 23, 39].

Following the social support theory, the concept is often regarded as consisting as four dimensions that also reflect Williams et al.'s [39] synthesis of the definition of social support, which was first proposed by House [14]. These four dimensions are: 1) emotional support (e.g. encouragement, esteem, affect, trust, and concern, such as giving a pep talk), 2)

instrumental support (e.g. money, labor, and tangible and material support, such as going for a walk with the dieter), 3) appraisal (affirmation and feedback, such as telling the dieter that he or she is doing a great job), and 4) informational support (e.g. advice, guidance, and suggestions, such as telling the dieter about the calorie content) [see e.g. 14, 16, 32, 39]. As revealed by the interpretations of the different support types, appraisal is similar to emotional support; in practice, it is hard to make a distinction between the two. These two support types can also be classified under nurturing support [23].

The context of the study should define how the concept of social support is interpreted. As Williams et al. argued [39], "It is naive to think that a concept can be developed to the point where it can be applied usefully to all situations" [p. 957]. Hence, it is also relevant to discuss the concept's applicability to the digital environment and in the context of weight loss.

Hwang et al. [17] conducted an exploratory study of discussion forum messages in a public anonymous Internet weight loss community and concluded that social support was exchanged in the form of encouragement, motivation, information, and shared experiences among the members. In their study, encouragement, motivation, and shared experiences can be interpreted as emotional support, whereas information sharing can be interpreted as informational support. In their other study, Hwang et al. [18] also tested the suitability of the Weight Management Support Inventory Scale [see 32] for measuring social support (emotional support, informational support, instrumental support, and appraisal) in the online environment. They found it appropriate for three of the four types of support: emotional support, informational support, and appraisal. These studies show that online communities provide a venue for sharing emotional and informational support. This and the discussion in Section 2.1 lead us to the following hypotheses:

*H1: Increased frequency of using online forum based peer support group leads to increased functional support, namely emotional support.*

*H2: Increased frequency of using online forum based peer support group leads to increased functional support, namely informational support.*

Similar results have been found in relation to social networking sites as support forums. Vaterlaus et al. [35] conducted focus groups and interviews to examine young adults' perceptions of social media's influence on their health behaviors. Through the use of social networking site (Facebook), the young adults were able to expand their food choices by finding new

inspirations for cooking and were encouraged by social media to make positive food choices. A study inspecting Weight Watchers' Facebook page concluded that the Facebook community could provide a venue for its members to give and/or receive emotional and informational support [1]. Based on this and the discussion in Section 2.1, we suggest the following hypotheses:

*H3: Increased frequency of using Facebook based peer support group leads to increased functional support, namely emotional support.*

*H4: Increased frequency of using Facebook based peer support group leads to increased functional support, namely informational support.*

Although emotional and informational support can be found in both kinds of platforms, there is some evidence that these channels differ in the functional support types that they primarily provide. Social networking sites such as Facebook are especially set up to meet the need for social and emotional connection [see e.g. 4, 31]. On the other hand, Chung [4] found that persons seeking information focused on reading forums and not on interacting in social networking sites. In the same vein, in anonymous online forums, informational support has been found to be the primary type of support after emotional support in HIV/AIDS online self-help groups [6] and Huntington's disease support groups [5]. These results indicate that the

channel type used to provide a platform for sharing social support might have consequences on how the functional support is perceived. A channel with a higher level of social elements might be more suitable to deliver emotional support, whereas a channel with a lower level of social elements delivers primarily informational support.

While informational support and emotional support are widely found in quantitative and qualitative studies, some evidence of the existence of instrumental support in anonymous online forums has also been found. However, instrumental or tangible online social support is considerably rare compared with informational and emotional support [5, 6]. In a quantitative study by Hwang et al. [18], instrumental support was not evident, and the authors suggested omitting it from the Weight Management Support Inventory Scale in the online context [see 32]. Based on this weak significance of instrumental support in anonymous OSGs, we suggest the following hypothesis:

*H5: Increased frequency of using online forum based peer support group has no effect on instrumental support.*

Based on the literature on different channel roles in online social support, we suggest that the lack of relevance of instrumental social support in the study of Hwang et al. [18] might be due to the nature of the community where the data came from. In that

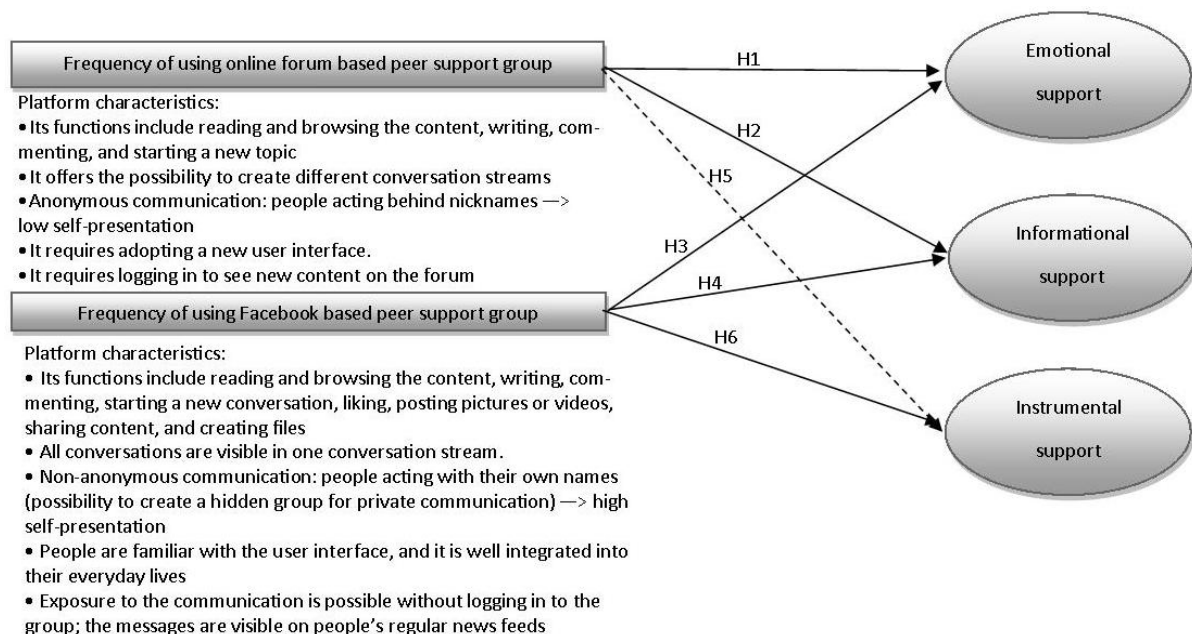


Figure 1 Hypothesized model.

community context, anonymity is an important factor that does not encourage people to interact in real life or to offer tangible support to one another. The situation might be different if the participants would interact online with their real identities or on a platform that is highly integrated into their everyday offline lives. Therefore, we propose the following hypothesis:

*H6: Increased frequency of using Facebook based peer support group leads to increased instrumental support.*

Figure 1 summarizes the special features of the two studied social support platforms and presents the suggested hypotheses.

### 3. Methodology and data collection

#### 3.1. Data collection and context

This study used a quantitative approach in which survey data were collected from the participants of a six-week online weight-loss program organized by a commercial service provider specializing in online training for different target groups. The program was directed to overweight people aiming at losing weight by following diet instructions and doing planned exercises. The program's overall goal was to help participants learn and adopt a healthier lifestyle.

As Oinas-Kukkonen [27] stated, it is important to describe the persuasion system design of the studied BCSS. The basic instructions (diet and exercise instructions, recipes, weekly encouragement video) were delivered weekly via the service provider's website. The website also featured a closed discussion forum for this specific training course, where participants were able to ask the trainer team about diet, exercise, and so on. There were also sections for participants to hold discussions anonymously (using nicknames) with one another and share their thoughts and feelings. They were able to start a new discussion, comment on already started discussions, and read messages that others had posted. This was also a platform for participants to meet each other without the participation of company representatives. Additionally, one "senior participant," not working for but with the service provider, started a closed Facebook group that the participants could join if they wanted to. There they could post comments, respond to others' comments, upload pictures or videos, share files, "like," and simply follow the ongoing conversation in their Facebook feeds. On Facebook, the participants operated with their real names, faces, and profiles.

An online survey was sent via e-mail to all the participants right after the training period ended. This resulted in 519 responses, with an effective response rate of 69% of those who opened the survey link.

#### 3.2. Survey measures

Table 1 presents the scales used in this study. The scales used by Ballantine and Stephenson [1] were adapted to measure emotional and informational support in the context of this study. The emotional support measures were developed by Hwang et al. [17], while the informational support measures were developed by Ballantine and Stephenson based on the exploratory research of Hwang et al. [17].

The scale for measuring instrumental support was adopted in the works of Rieder and Ruderman [32] and Lin et al. [23]. However, in those studies, the questions were about a hypothetical situation and not about actual behavior. In the present study, the presentation and wording of the questions were revised based on the assumption that a person who felt that he or she was able to receive instrumental support from peers had enough to fill this need. It is important to add that these scales specifically measured the support received by participants from their weight-loser peers, not the generally perceived social support. Each question was measured using a seven-point Likert scale with responses ranging from strongly agree to strongly disagree.

The scales for measuring the frequency of using Facebook based support peer group (7 items) and the frequency of using forum based peer support group (3 items) were developed for this research due to the particular features of these channels. These scales were also developed following Chung [4], Hwang et al. [16], and Men and Tsai [24]. For each question, the responses on the Likert-type scale were as follows: 1 = never, 2 = once during the six-week period, 3 = a few times during the six-week period, 4 = once a week, 5 = a few times a week, 6 = daily, and 7 = several times a day.

**Table 1. Study measures**

<b>Informational support (adapted from [1, 17])</b>
I get information on how I should eat and exercise from other members.
I get valuable information from other members.
Other members help me understand which foods I should and shouldn't be eating to lose weight.
If I have a question related to losing weight, I can usually get answers from other members.
The information from other members helps me plan my own actions better.
I get good tips on how to lose weight from other users.
<b>Emotional support (adapted from [1,17])</b>
I believe that other members care for me.
Other members make me feel important.
I feel accepted by other members.
I get comfort from other members when I am disappointed with my weight loss outcomes.
When I want to express my feelings related to the process, I want to share them with other members.
Other members of this program encourage me to lose weight.
Other members are sympathetic towards me.
Seeing the success of other members helps me stay on my weight loss program.
<b>Instrumental support (adapted from [32, 23])</b>
I am able to find training companions from this group if I wanted to.
Other members are ready to exercise with me if I don't feel like exercising alone.
If I buy an unsuitable product in relation to the training instructions (e.g. diet supplement, training outfit), I am able to sell it to other members.
<b>Frequency of use (adapted from [4, 16, 24])</b>
<b>Forum based group participation:</b>
How often did you...
...read content produced by other members in the forum?
...participate in a conversation started by other members in the forum?
...start a new conversation in the forum?
<b>Facebook based group participation:</b>
How often did you...
...read content produced by other members in the Facebook group?
...like somebody's comment or photo in the Facebook group?
...search for information related to this training program in the Facebook group?
...browse pictures in the Facebook group?
...share your own pictures or videos in this Facebook group?
...participate in a conversation started by other members in the Facebook group?
...start a new conversation in the Facebook group?

## 4. Results

### 4.1. Participants' characteristics

The respondents were mostly female (92.9%), with a mean age of 35. They lost an average of 4.93 kg (ranging from an 18-kg loss to a 1.2-kg gain) in six weeks. The average body mass index (BMI) was 29.18 at the beginning of the program and 27.43 at the end of the program. Most respondents (71.1%) used social media at least daily, and only 19% reported not using social media at all.

### 4.2. Exploratory factor analysis

In the first phase of data analysis, exploratory factor analysis was performed with IBM SPSS Statistics 22 to verify the hypothesized model. The analysis led to a five-factor solution, identifying emotional support, informational support, instrumental support, Facebook based group usage, and forum based group usage factors. The factor solution explained 77.2% of the variance, with all eigenvalues over 1. Additionally, the values of the Kaiser-Meyer-Olkin test (0.953) and Bartlett's test ( $p = 0.000$ ) indicated that the data were suitable for confirmatory factor analysis.

### 4.3. Confirmatory factor analysis and structural model

In the second phase, Smart PLS 3.0 was used for confirmatory factor analysis [11]. The measurement model was constructed based on the exploratory factor analysis results. All items indicated high levels of internal consistency, as composite reliabilities ranged from 0.832 to 0.964 and Cronbach's alpha ranged from 0.718 to 0.957, exceeding the minimum cut-off score of 0.7 [see 25] (see Table 2).

**Table 2. Values of Cronbach's alpha, composite reliability, and AVE**

Factor	Cronbach's alpha	Composite reliability	AVE
EMO <sup>a</sup>	.957	.964	.771
Facebook	.950	.952	.740
Forum	.718	.832	.625
INF <sup>b</sup>	.950	.960	.800
INS <sup>c</sup>	.820	.889	.727

<sup>a</sup> emotional support, <sup>b</sup> informational support, <sup>c</sup> instrumental support

To assess the convergent validity, the average variance extracted (AVE) was calculated; with the smallest value being 0.625, the AVEs were found suitable, explaining over half of the variance in all the cases (see Table 2).

Discriminant validity was verified using the Fornell-Larcker criterion [see 9]. None of the factor loadings exceeded the square root of AVE, indicating the discriminant validity of the factors (see Table 3).

**Table 3. Discriminant validity**

Factor	EMO*	Facebook usage	Forum usage	INF*	INS*
EMO <sup>a</sup>	<b>.878</b>				
Facebook	.562	<b>.860</b>			
Forum	.346	.339	<b>.790</b>		
INF <sup>b</sup>	.755	.494	.391	<b>.894</b>	
INS <sup>c</sup>	.612	.384	.158	.637	<b>.853</b>

Values of AVE squared on the diagonal in boldface

<sup>a</sup> emotional support, <sup>b</sup> informational support,

<sup>c</sup> instrumental support

#### 4.4. Hypothesis testing

Table 4 summarizes the results of the hypotheses tests. The results confirm that Facebook based group usage has a relatively high positive effect on perceived emotional support ( $\beta = 0.502$ ,  $p < 0.01$ ), informational support ( $\beta = 0.409$ ,  $p < 0.01$ ), and instrumental support ( $\beta = 0.373$ ,  $p < 0.01$ ). Although forum based group usage also has a positive effect on perceived emotional support ( $\beta = 0.176$ ,  $p < 0.01$ ) and informational support ( $\beta = 0.252$ ,  $p < 0.01$ ), it has no significant influence on perceived instrumental support ( $p > 0.05$ ), as expected.

**Table 4. Structural model results**

Path effects	B
H1 Forum usage > Emotional support	.176***
H2 Forum usage > Informational support	.252***
H3 Facebook usage > Emotional support	.502***
H4 Facebook usage > Informational support	.409***
H5 Forum usage > Instrumental support	.032 †
H6 Facebook usage > Instrumental support	.373***

\*\*\*  $p < 0.01$ , † - insignificant

Furthermore, as table 4 shows that Facebook based group usage has much greater effects on all perceived functional support forms compared with forum based group usage. Unlike forum based group usage, Facebook group usage significantly influences

perceived instrumental support. Furthermore, whereas the effect of Facebook based group usage is strongest on emotional support, the effect of forum usage is strongest on informational support; these results highlight the different roles of the two peer-support system platforms.

The path coefficients ( $\beta$ ), determination of coefficients ( $R^2$ ), and predictive relevance ( $Q^2$ ) values of the model provide support for its predictive relevance (Table 5). Predictive accuracy in terms of  $R^2$  (adjusted) suggests that Facebook and forum group usage satisfactorily explain part of the social support types. Additionally, Stone-Geisser's  $Q^2$  supports the model's predictive relevance to a specific dependent variable.

**Table 5. Determination coefficient ( $R^2$ ) and predictive relevance ( $Q^2$ ) values**

	$R^2$ ( $R^2$ adj.)	$Q^2$
Emotional support	.343 (.340)	.262
Informational support	.301 (.298)	.236
Instrumental support	.148 (.145)	.094

#### 5. Discussion

This study contributes to the discussion of HBCSSs and one component of the PSD model, namely social support, by confirming that modifying structural support online can influence perceived functional support. The result show that frequency of use of support groups facilitates perceived functional support. Furthermore, participating in different online platforms can influence the perceived functional support types differently.

The study makes several contributions to the literature. First, the results enrich the discussion about functional social support types in the online environment and their dependence on the delivery platform. The study results confirm the findings that OSGs in Facebook [1, 35] and in online forums [16-18] can provide a venue for their members to give and receive social support, particularly emotional and informational support. The study results also show that instrumental support can be shared through the online environment, in contrast to the findings of Hwang et al. [18]. However, a significant path is only found in Facebook and not in online forums. Hence, the findings support the insignificant effect of the anonymous online community on instrumental support found by Hwang et al. [18]. The difference might be explained by the non-anonymous nature of Facebook and by the fact that people's interactions in Facebook with their own names and real profiles might give the



participants a stronger sense of communicating with “real people.” Furthermore, the results indicate that if Rieder and Ruberman’s [32] Weight Management Support Inventory Scale is used in the online environment, instrumental support cannot be omitted from the scale, as Hwang et al. [18] suggested, since the platform for online social support seems to influence the perceived functional support types. Instrumental support can be delivered to communities in social networks such as Facebook, but not necessarily to closed anonymous communities such as online forums. Moreover, the exact measures for analyzing instrumental support in the online environment should be modified to fit the nature of the online context better.

Second, the results contribute to the discussion about the desirable functions of online social support platforms, particularly the delivery of functional support. Facebook usage, rather than the use of anonymous online forums offered by the service provider, seems to be the primary driver of all perceived functional support types (emotional, informational, and instrumental). Facebook communication is rather rich, since the multiple interactive actions (e.g. liking, sharing photos and videos) might drive higher social benefits. In contrast, in forums, communication among users is less rich due to the limited technical possibilities (starting a new topic or commenting on an already started conversation) and participation behind anonymous nicknames. In this study, the effect of Facebook usage is strongest on perceived emotional support, while the impact of forum usage is strongest on perceived informational support; this reflects the results of qualitative studies related to functional support types in online forums [5, 6]. The results of the present study are in line with Chung’s [4] findings that the social elements of social media platforms are especially suitable to offering emotional support. These results also support the notion of Rau et al. [31] that social networking sites are specifically set up to meet the need for social and emotional connection. Therefore, it is evident that the nature of the platform influences the perceived social support types.

Third, to shed light on the suitable platform for peer social support [17, 29], this study concludes that communities providing a safe, closed environment for communication, which are already integrated into the users’ everyday lives [see also 12, 28] and are not just built around a common interest but also offer the possibility for high self-presentation [see also 19], present the most effective platform for sharing and receiving functional support. In other words, platforms such as Facebook seem to offer suitable technical solutions that provide an effective environment for

social support. These platforms are known and already being used, which might contribute to the participants’ greater likelihood of using the channel and their greater exposure to supportive communication actions. This, in turn, might have advantageous behavioral consequences. This is an important notion to understand when planning a health intervention where social support is an essential part. In all cases, it is important to secure an intimate type of conversation by setting the group as private and hidden, although the study results challenge the requirement of anonymity to effectively deliver social support.

Although already existing external platforms seem to have their advantages, their limitations and the possible consequences of choosing to utilize them as support platforms should not be forgotten. As Ploderer et al. [30] noted, people might not want to mix their everyday lives with their support groups. Nevertheless, both channels may offer unique value and complement each other in terms of strengthening the overall social support.

## **6. Limitations and avenues for further research**

Certain limitations should be taken into account when interpreting the study results. This study’s main limitations arise from the context of the data (one online weight-loss training program) and the considerably high proportion of female respondents. Therefore, caution must be exercised in generalizing the results. Moreover, only three structural social support types were analyzed because they were the ones most commonly found in previous research. Future research should examine more functional support types existing in the online environment. Additionally, the context of this study, weight loss, should be kept in mind when interpreting the findings.

This research raises several new and interesting questions related to HBCSSs and the modification of social support in the PSD model. More research is required on the different natures of online social support platforms to gain a better understanding of the functions that explain the differences in perceived functional support types. Qualitative research on these different kinds of OSGs is also needed to understand them more comprehensively. Such research could also provide a better explanation of this study’s results (i.e. how communication differs between online forums and Facebook groups and what aspects might influence the communication style). Furthermore, it would be interesting to examine more closely how different types of individuals benefit from different kinds of forums.

Even though the anonymous nature of communication is one of the main strengths of online support [see e.g. 3, 17, 41], Facebook's non-anonymous nature might also influence the results and perceived functional support types positively. This positive influence might be due to the fact that the studied Facebook group was hidden (i.e. nonmembers could not find the group) and access was provided only to those who participated in the program; this gave the participants enough sense of safety to share within this community. Perhaps it is not about anonymity but the sense of safety and trust within a group. This is an important issue that requires further research.

Research investigating the behavioral consequences of online social support could further clarify the role of functional support and the meaning of social support in behavioral change. The meaning and formation of trust within different OSG platforms would also be an interesting topic of study. This would help health practitioners better manage and facilitate communication within OSGs.

## 7. References

- [1] P.W. Ballantine and R.J. Stephenson, "Help me, I'm fat! Social support in online weight loss networks", *Journal of Consumer Behaviour*, 2011, 10, 6, pp. 332–337.
- [2] G.E. Belch, and M.A. Belch, *Advertising and Promotion: an Integrated Marketing Communications Perspective*, 2007, McGraw-Hill/Irwin, New York, NY.
- [3] H. Bugshan, M. Nick Hajli, X. Lin, M. Featherman, and I. Cohen, "Social media for developing health services", *Qualitative Market Research: An International Journal*, 2014 17, 3, pp. 283–296.
- [4] J.E. Chung, "Social networking in online support groups for health: how online social networking benefits patients", *Journal of Health Communication*, 2014, 19, 6, pp. 639–659.
- [5] N.S. Coulson, H. Buchanan, and A. Aubeeluck, "Social support in cyberspace: A content analysis of communication within a Huntington's disease online support group". *Patient Education and Counseling*, 2007, 68, pp. 173–178.
- [6] C. K. Coursaris and M. Liu, "An analysis of social support exchanges in online HIV/AIDS self-help groups", *Computers in Human Behavior*, 2009, 25, 4, pp. 911–918.
- [7] K. Elfhag and S. Rössner, "Who succeeds in maintaining weight loss? A conceptual review of factors associated with weight loss maintenance and weight regain", *Obesity Review*, 2005 6, 1, pp. 67–85.
- [8] B.J. Fogg, *Persuasive technology: using computers to change what we think and do*, 2003, Morgan Kaufmann Publishers, San Francisco.
- [9] C. Fornell and F.D. Larcker. "Evaluating Structural Equations Models With Unobserved Variables and Measurement Error." *Journal of Marketing Research*, 1981, 18, 2, pp. 6–21
- [10] A. Gorin, S. Phelan, D. Tate, N. Sherwood, R. Jeffery, and R. Wing. "Involving Support Partners in Obesity Treatment", *Journal Consulting Clinical Psychology*, 2005, 73, 2, pp. 341–343.
- [11] J. F. Jr. Hair, G.T.M. Hult, C.M. Ringle, and M. Sarstedt, M. A primer on partial least squares structural equation modeling (PLS-SEM). 2014, Thousand Oaks: Sage publications.
- [12] N.R. Hardiker and M. J. Grant, "Factors that influence public engagement with eHealth: a literature review", *International Journal of Medical Informatics*, 2011, 80, 1, pp.1–12.
- [13] J. B. Hittner and R. J. Swickert, "Modeling Functional and Structural Social Support via Confirmatory Factor Analysis: Evidence for a Second-Order Global Support Construct", *Journal of Social Behavior and Personality*, 2001, 16, 1, pp. 69–80.
- [14] J.S. House, J. S. Work stress and social support 1981. Reading, MA: Addison-Wesley. Houston.
- [15] T.-C., Hsu, J. S.-C., Cheng, H.-L., and C.-M. Chiu, "Exploring the relationship between receiving and offering online social support: A dual social support model", *Information & Management*, 2015, 52, 3, pp. 371–383.
- [16] K.O. Hwang, J.M. Etchegaray, C.N. Sciamanna, E.V. Bernstam, and E.T. Thomas. "Structural social support predicts functional social support in an online weight loss programme", *Health Expectations: An International Journal of Public Participation in Health Care and Health Policy*, 2014, 17, 3, pp. 345–352.
- [17] K.O. Hwang, A.J. Ottenbacher, A.P. Green, M.R. Cannon-Diehl, O. Richardson, E.V. Bernstam, and E.J. Thomas, "Social support in an Internet weight loss community", *International Journal of Medical Informatics*, 2010, 79, 1, pp. 5–13.
- [18] K.O. Hwang, A.J. Ottenbacher, J.F. Lucke, J.M. Etchegaray, A.L. Graham, E.J. Thomas, and E.V. Bernstam, "Measuring social support for weight loss in an internet weight loss community", *Journal of Health Communication*, 2011, 16, 2, pp.198–211.
- [19] A.M. Kaplan, and M. Haenlein, "Users of the world, unite! The challenges and opportunities of Social Media", *Business Horizons*, 2010, 53, 1, pp. 59–68.
- [20] P. Leahy-Warren, G. McCarthy, and P. Corcoran, "Postnatal Depression in First-Time Mothers: Prevalence and Relationships Between Functional and Structural Social

Support at 6 and 12 Weeks Postpartum", *Archives of Psychiatric Nursing*, 2011, 25, 3, pp. 174–184.

[21] T. Lehto, and H. Oinas-Kukkonen, "Explaining and predicting perceived effectiveness and use continuance intention of a behaviour change support system for weight loss", *Behaviour & Information Technology*, 2015, 34, 2, pp. 176–189.

[22] T. Lehto, H. Oinas-kukkonen, T. Pätäälä, and O. Saarelma, "Virtual health coaching for consumers: a persuasive systems design perspective", *International Journal of Networking and Virtual Organisations*, 2013, 13, 1, pp. 24–41.

[23] T.-C. Lin, J.S.-C. Hsu, H.-L. Cheng, and C.-M. Chiu, "Exploring the relationship between receiving and offering online social support: A dual social support model", *Information & Management*, 2015, 52, 3, pp. 371–383.

[24] L. R. Men and W. S. Tsai, "Beyond liking or following: Understanding public engagement on social networking sites in China", *Public Relations Review*, 2013, 39, 1, pp. 13–22.

[25] J. Nunnally, *Psychometric Theory*, 1978. McGraw-Hill, New York

[26] H. Oinas-Kukkonen, "Behavior Change Support Systems: A Research Model and Agenda", In *Persuasive Tehcnology*, 2010, 6137, pp. 4–14.

[27] H. Oinas-Kukkonen, "A foundation for the study of behavior change support systems", *Personal and Ubiquitous Computing*, 2013, 17, 6, pp. 1223–1235.

[28] H. Oinas-kukkonen, and M. Harjumaa, "Persuasive Systems Design: Key Issues, Process Model, and System Features", *Communications of the Association for Information Systems*, 2009, 24, 28, pp. 485–500.

[29] H.J. Oh, C. Lauckner, J. Boehmer, R. Fewins-Bliss, and K. Li, "Facebooking for health: An examination into the solicitation and effects of health-related social support on social networking sites", *Computers in Human Behavior*, 2013, 29, 5, pp.2072–2080.

[30] B. Ploderer, W. Reitberger, H. Oinas-Kukkonen, and J. van Gemert-Pijnen, "Social interaction and reflection for behaviour change", *Personal and Ubiquitous Computing*, 2014, 18, 7, pp. 1667–1676.

[31] P.L.P. Rau, Q. Gao, and Y. Ding, "Relationship between the level of intimacy and lurking in online social network services", *Computers in Human Behavior*, 2008, 24, 6, pp.2757–2770.

[32] S. Rieder, and A. Ruderman, "The development and validation of the weight management support inventory", *Eating Behaviors*, 2007, 8, 1, pp. 39–47.

[33] M. Tanis, "Health-related on-line forums: What's the big attraction?" *Journal of Health Communication*, 2008, 13, 7, pp. 698–714.

[34] A.N. Teoh, M.S.C. Chia, and V. Mohanraj, "The Comparison Between Active and Passive Types of Social Support: The Emotional Responses", *Journal of Applied Biobehavioral Research*, 2009, 14, 2, pp. 90–102.

[35] J.M. Vaterlaus, E.V. Patten, C. Roche, and J. Young, "#Gettinghealthy: The perceived influence of social media on young adult health behaviors", *Computers in Human Behavior*, 2015, 45, 1, pp. 151–157.

[36] M. W. Verheijden, J.C. Bakx, C. van Weel, M. Koelen, and W. van Staveren, "Role of social support in lifestyle-focused weight management interventions", *European Journal of Clinical Nutrition*, 2005, 59, 1, pp. 179–186.

[37] J. B. Walther, and S. Boyd, Attraction to computer-mediated support. In Carolyn A. Lin & David J. Atkin, (Eds.) *Communication and society: Audience adoption and uses* (pp. 153–188). 2002, Cresskill, NJ: Hampton Press. Weinberg,

[38] M. Welch, "Appropriateness and acceptability: Employee perspectives of internal communication", *Public Relations Review*, 2002, 38, 2, pp. 246–254.

[39] P. Williams, L. Barclay, and V. Schmied, "Defining social support in context: a necessary step in improving research, intervention, and practice", *Qualitative Health Research*, 2004, 14, 7, pp. 942–960.

[40] R.R. Wing, and R.W. Jeffery. "Benefits of recruiting participants with friends and increasing social support for weight loss and maintenance", *Journal of Consulting and Clinical Psychology*, 1999, 67, 1, pp. 132–138.

[41] K.B. Wright, and S.B. Bell. "Health-related Support Groups on the Internet: Linking Empirical Findings to Social Support and Computer-mediated Communication Theory", *Journal of Health Psychology*, 2003, 8, 1, pp. 39–54.