

Integrating health theories in health and fitness applications for sustained behavior change: current state of the art

- [Jobs](#)

Paper Menu >>

- [Abstract](#)
- [Full-Text PDF](#)
- [Full-Text HTML](#)
- [Full-Text ePUB](#)
- [Linked References](#)
- [How to Cite this Paper](#)

Journal Menu >>

- [Indexing](#)
- [View Papers](#)
- [Aims & Scope](#)
- [Editorial Board](#)
- [Guideline](#)
- [Article Processing Charges](#)
- [Paper Submission](#)
- [CE Subscription](#)
- [Free Newsletter Subscription](#)
- [Most popular papers in CE](#)
- [Publication Ethics Statement](#)
- [About CE News](#)
- [Frequently Asked Questions](#)
- [Open Special Issues](#)
- [Published Special Issues](#)
- [Special Issues Guideline](#)

Published Online December 2012 in SciRes (<http://www.SciRP.org/journal/ce>) DOI:10.4236/ce.2012.38b001
Copyright © 2012 SciRes.

1

Integrating Health Theories in Health and Fitness Applications for Sustained Behavior Change: Current State of the Art

Angela Brunstein¹, Joerg Brunstein², Selma Limam Mansar²

¹Department of Psychology, Division of Population Health Sciences, Royal College of Surgeons in Ireland - Medical University of Bahrain, Bussaiten, Bahrain

²Dietrich College of Humanities and Social Sciences, Information Systems Program, Carnegie Mellon University in Qatar, Doha, Qatar

Email: abrunstein@rcsi-mub.com

Received 20 1 2

Two hundred million people in the US are overweight or obese mirroring a worldwide trend that is associated with high morbidity and mortality rates. Health and fitness mobile technology applications have great capacities for supporting dieters' lifestyle changes and could profit from and provide input of health behavior theories. Those theories have been demonstrated with massive clinical evidence to be efficient for fostering healthy lifestyle changes and weight loss. This research reviewed the 100 most popular mobile technology applications from iTunes App Store's Health and Fitness category in respect coverage of health behavior theories' concepts and chose 14 of those for a complete analysis. Applications provide good support for athletes' workouts and have great potential to be extended to serve overweight users as well. Missing features could be easily implemented given the current state of technology. These developments look promising for tackling sustained weight loss in many mobile technology users.

Keywords: Health and Fitness Applications; Health Behavior Theories; Mobile Technology Applications

Introduction

Overweight users of health applications face complex daily challenges when trying to change their lifestyle. Not used to low calorie food and not ready yet for advanced exercise, they have to integrate new procedures into already established daily routines. Often there are knowledge gaps to be filled. They may be overwhelmed by the scale of the project, lack motivation, and may need support for coming back on track after relapses.

When using health and fitness applications for supporting these aims, overweight users need to know with confidence why they are doing what they are doing and what the health benefits from those exercises will be.

The interplay of all these factors is covered in intensively researched health behavior theories. Mobile applications can nicely complement those theories because of their computing power, multimedia and communication capacities, and their capacities for tracking daily activities of patients who are seen by their healthcare provider only on weekly or monthly basis. Health behavior theories use detailed information about a person for predicting the likelihood of initiation and maintenance of health behaviors. Health applications can support the process of behavior change by providing in time, user and stage-specific advice and encouragement.

Current health and fitness applications use already successful smartphone capabilities for supporting goal oriented behavior and it does not take effort much to integrate the remaining components of health behavior theories. The benefit of doing so would be huge in terms of user adaptation. Current health and fitness applications are well adapted to athletes who experience workout and exercise as rewarding by themselves. They are not well adapted for the potentially 200 million overweight and obese smartphone users in the US. The majority of those might have never seen a gym from the inside. When combining the strengths of health behavior theories and mobile phone technologies, both can greatly profit. Mobile technology can provide much more precise input to health behavior theories than

from participants' self-evaluation. Health applications developers could win huge numbers of new customers

ers could win huge numbers of new customers.

For this research, we have evaluated 14 mobile technology applications from the Health and Fitness category of the iTunes App Store in respect to already covered components of health behavior theories. The conclusion of our work will indicate there is already good coverage for some of those components and first implementations and great potential for the remaining components. In this paper, we describe the prevalence of obesity and briefly review evidence that mobile technology has been successfully used to tackle that epidemic obesity problem. Then we will briefly sketch the health behavior theories and our method and analysis of reviewed health applications. Finally we will review results using 5K Runner as an example and review suggestions for further development.

Obesity Prevalence

According to World Health Organization figures (WHO, 2010), in 2008, 63% of deaths worldwide were caused by non-communicable diseases, including cardiovascular diseases, cancers, diabetes, and lung diseases. These diseases are strongly associated with health risk behaviors, such as smoking, unhealthy diet, insufficient physical activity, and alcohol abuse (WHO, 2010). Between 1980 and 2008, worldwide obesity has almost doubled (WHO, 2010). In the American WHO regions, 62% were overweight. In other regions, prevalence statistics are similar. For example, in Bahrain diabetes type 2 prevalence was 15% in 2010 with 61% of Bahraini males and 67% of Bahraini

A. BR UNS TEIN ET AL.

Copyright © 2012 SciRes.

2

females being overweight or obese (Shaw et al., 2010). There is evidence that habitual energy imbalance of only a few kcal can result in a slow, but substantial gradual weight gain (e.g., M-zaffarian et al., 2011). At the same time, modest lifestyle changes can reverse that trend and result in sustainable weight loss (e.g., Hall, 2012).

Mobile Technology and Obesity

Mobile technologies with their advanced computing and communication capabilities can promote efforts for lifestyle changes (e.g., Boulous et al., 2011). There is also increasing evidence that mobile technologies can be efficiently used for supporting those aims (e.g., Free et al., 2010; Web et al., 2010). For example, shoppers provided with food substitution advice continued buying healthier alternatives after program completion (Huang et al., 2006). Weekly emails on patients' stage and specific goals impacted their eating habits (Patrick et al., 2009).

In 2009, 67% of inhabitants globally had a mobile phone subscription (Geneva, International communication Union, 2010). In 2011, 34% of US households had wireless phones only (Blumberg et al., 2012). In Qatar, the mobile phones subscription rate reached 121% during that time (IctQatar Landscape, 2009, update 2011). This indicates that patients in need of changing their lifestyle can be reached and supported via mobile technology. Indeed, many smart phone application stores, including iTunes App Store, Google Play, and Amazon Appstore, provide a "Health and Fitness" category.

When promoting a healthier lifestyle, mobile technologies should implement prevalent health behavior theories that have been successfully implemented for obesity and diabetes management, smoking cessation, and other health related habits in clinical settings. These include the Health Belief Model (HBM; Becker & Rosenstock, 1984), Theory of Planned Behavior (TPB; Ajzen & Fishbein, 1970; Ajzen, 1991), Transtheoretical Model or Stages of Change Model (TTM; Prochaska & DiClemente, 1984; Prochaska et al., 1994) and the Health Action Process Approach (HAPA; Schwarzer, 1992; Schwarzer et al., 2008). Because the HAPA integrates components from the other theories, we review here briefly the HBM, TPB, and TTM

only. Each of the theories provides a slightly different perspective on the issue of behavior change.

The Health Belief Model (HBM) focuses on a person's health related cognitions for determining their behavior. For example, when deciding whether to schedule an appointment for cervical cancer, a woman would consider whether she is likely to have that cancer, how severe the disease would be and what her costs and benefits of screening would be.

If her sister would be diagnosed with cancer, that might trigger scheduling an appointment herself (Murray & McMillan, 1993). Mobile health applications could support decision making by providing relevant health information and by popping up reminders, for example for scheduling exercise.

The Theory of Planned Behavior (TPB) acknowledges that a person's health behavior is only indirectly impacted by their beliefs and by social influence and is mediated by a person's intention resulting from those distal factors.

For example, perceived behavioral control based on earlier experience and social norms predicts whether a person would start to exercise and maintain that new habit (Armitage, 2005). Many mobile health applications include options for social networking or provide role models and social norms. Detailed feedback on workout performance can foster perceived behavioral control.

The Transtheoretical Model (TTM) suggests five stages that a person progresses through over time: During the pre-contemplation stage, a person has not recognized yet that they need to quit smoking, for example. During the contemplation stage, they start thinking about changing. During the preparation stage, the person plans when to throw away cigarettes and what to do instead of smoking. During the action stage, the person implements those plans. Finally, during the maintenance stage, the person aims to maintain abstinence and integrates new routines in their lifestyle. During relapse, a person leaves that cycle, for example by smoking, and returns thereafter to any of the five stages (DiClemente et al., 1991). Obviously, mobile health applications cannot serve users during the pre-contemplation stage, because those do not even consider yet changing their lifestyle. During contemplation stage, users could profit from relevant health information. During the planning stage, mobile health applications could help to set specific and achievable goals, maybe supported by healthcare providers' feedback. During the action phase, there is a challenge to provide specific and detailed instruction on one side and to enable users to perform on their own. Otherwise mobile health application work like car navigation systems: They tell you the way to the airport, but they do not introduce you to a new city. This balance is even more important during the maintenance stage, when users try to integrate new routines in their daily life. Finally, relapse and relapse management should encourage users to get back to their aims as fast as possible for limiting potential damage.

Methods

For this review, we have chosen the ten components of the three health behavior theories that were straightforward to analyze and not overlapping. We evaluated whether applications addressed perceived costs (1) and health benefits (2) and whether they provided cues for action (3; HBM). We evaluated whether applications supported subjective norms or social support (4) and promoted behavior control (5; TPB). Finally, we discussed which of the six stages (6–10) of the Transtheoretical Model could be supported. Because people in the pre-contemplation stage do not yet consider changing, we excluded that stage. We assume that people might browse for applications from the contemplation stage on.

We have focused on iTunes's What's Hot section of most downloaded applications for iPhones and iPads from the

Health and Fitness category. Most applications offered in that store are also offered for other platforms. From that section, we selected the top 100 applications (US store, state of September 1, 2012) and successively reduced the number of applications to 14 (see Table 1) by excluding applications that were not offered in English, were offered for free, did not cover health style related diet or physical activity behaviors, or had several very similar applications from the same publisher. We excluded free applications to reduce redundancy because most of those had paid siblings with very similar features. In addition, users demonstrate some commitment to changing their lifestyle when paying some money for downloading an application. From the original list of 100, 59 applications were for free, the remaining applications cost between \$0.99 and \$5.99. The

A. BRUNS TEINET AL.
Copyright © 2012 SciRes.

3

Table 1.

Analyzed applications, publisher, short description and analyzed components: cues to action (HBM3), subjective norm (TPB 4), behavior control (TPB 5), contemplation phase (TTM 6), preparation phase (TTM 7), action phase (TTM 8), maintenance phase (TTM 9), relapse phase (TTM 10).

Application Publisher Description HBM 3 TPB 4 TPB 5 TTM 6 TTM 7 TTM 8 TTM 9 TTM 10

5K Runner

Heavy Duty Apps

8 week running program

aiming for 5K

0

1

1

1

1

1

0

1

C25K TM - 5K Trainer

Pro

Zen Labs LLC

8 weeks running program

aiming for 5K

0

0

0

1

1

1

0

0

Daily Workouts

Daniel Miller

workout program and tracker

0

0

1

0

1

1

0

0

Endomondo Sports

Tracker Pro

Endomondo LLC

workout organizer and tracker

for distance based sports

1

1

1

0

1
1
1
1
1

Food Substitution
Calculator Lean Bodies
Consulting provision of healthier food
alternatives 0 1 0 1 1 0 0 0

Gorilla Workout: Athletic
Heckr LLC
workout program and tracker

1
1
1
1
1
1
1
0
0

MapMyRIDE+ GPS Cyc
MapMyFitness Inc
biking and running tracker

0
1
1
0
1
1
1
0

Mountain bike PRO
Runtastic GmbH
GPS based bike computer

1
1
1
0
0
1
1
0

myWOD - All in one
WOD Log for CrossFit Jimmy Tangeman workout organizer and tracker 1 1 1 0 1 1 1 0
Points Calculator Plus

Tracker
Greg Ellis
diet tracker

1
0
1
1
1
1
1
1
0

Seal Fitness Challenge
Jgo Labs LLC
fitness program

1
1
1
0
1
1
0
0

Walkmeter GPS Walking

Abvio Inc.

GPS-based fitness computer

0

1

1

0

1

1

0

1

Workout Hero TM

Storeboughtmil k Inc.

workout program and tra cker

1

1

1

1

1

1

1

1

Zombies, Run!

Six to Start

running game and audio

adventure

1

1

0

1

1

1

1

1

same range holds for the final selection. The final 14 applications required between 3.2 MB and 322 MB space on the device ($M = 45$ MB, $SD = 84$), and were ranked by customers with at least four stars ($M = 4.7$, $SD = 0.15$).

Results

As an illustration, 5K Runner provides a 3 days for 8 weeks running program for beginners with the final aim to master 5,000 m. As most other applications, 5K Runner does not link to relevant health information for the HBM. Under the Learn tab, the Help & Tips section informs about health requirements, what is needed to start, and about the best way to warm up. It also suggests to “consult a doctor before beginning”. For the TPB, 5K Runner provides several cues for perceived behavioral control: While running, the application provides visual and auditory feedback on progress and a halfway notification (TPB5). It awards different badges after completing a workout and automatically tracks and records training sessions. However, it does not track distance or physiological parameters or contributes to changing personal attitudes toward running. For implementing subjective norms (TPB 4), there is an option to use social networking tools to broadcast accomplishments, but no role models or options to team up for running. For the TTM, 5K Runner provides support for the preparation phase (TTM 7) under its learn tab, help & tips section. By providing detailed instruction, when to walk and when to run, it guides the action phase (TTM 8) for 3 days a week. This might also contribute to the beginning of the maintenance phase (TTM 9) because it is tailored for 8 weeks. Still, there is no instruction on how to maintain performance once a user has reached the 5K goal. For relapse stage (TTM 10), there is a message in the help & tips section, but not a complete relapse management.

In total, ten applications had options for social networking (TPB 4), for sending emails or getting applause and encouragement from friends. This kind of social support is as good as

agement from friends. This kind of social support is as good as your friends are. Workout Hero™ provided a list with heroes, benchmark girls/boys, etc. as an implementation of subjective norms. Daily Workouts and other exercise programs provide videos with demonstrations on how to perform an exercise. These can contribute to subjective norms (TPB 4) and to behavioral control (TPB 5, N = 11). What is missing in all programs we evaluated is an interface for the healthcare provider that could either feed performance data back to the healthcare provider or for enabling guidance for the patient. There was also no relationship between provided instruction and relevant health information (HBM 1 and 2). For example, the Food Substitution Calculator might suggest substituting bread with green beans, but would fail to explain how this serves health goals.

Contemplation and relapse phases (TTM 6, N = 7, and TTM 10, N = 5) were neglected by most applications. Zombies, run! starts the first time with a little story explaining the scenario. In contrast, most of the workout programs start immediately with choosing an exercise (TTM 8, N = 13). In case of a relapse (TTM 10), SEAL Fitness Challenge ranks the user back to 'wannabe' canceling out all accomplishments made so far. This might trigger motivational issues for users when attempting to get back on track. In contrast, 5K Runner provides encouragement for "I had a really bad run" saying that even Michael Jordan had occasionally bad days under its Help & Tips section.

A. BRUNSTEIN ET AL.

Copyright © 2012 SciRes.

4

This kind of (re-)lapse management is especially important because there is evidence that, for example, dieters in pre-load studies tend to lose control and overeat after consuming a high calorie milkshake in the morning, the 'what-the-hell effect' (Herman & Mack, 1975). It seems many dieters think in all-or-none terms and do not have a backup plan in case of lapse. While the SEAL Fitness Challenge supports that kind of thinking, the 5K Runner invites for reframing the problem and getting back to track. The milkshake in the morning spoils today's diet. Whatever comes after that, could spoil the whole last week's effort!

Many reviewed applications did also miss to address the maintenance phase (TTM 9, N = 7). Once a C25K™ - 5K Trainer Pro user has reached the magical 5,000 meters, how shall they keep up performance and fitness?

Discussion

Most health and fitness applications on iTunes' What's Hot? list provide instruction and tracking how to perform health-related behavior, but are only loosely associated with detailed health information. They also cover some, but not all components of health behavior theory. This makes it impossible to predict success for adopting healthier behaviors using those applications based on these theories. Technology has sufficiently advanced to implement the theories. They can take the burdens from patients tracking their performance and can provide much more precise measures, for example for physical activity than patients could approximate.

To return to our 5K Runner example, the application could integrate HBM components more, by taking, for example, Body Mass Index and other variables as input and tailoring the running program accordingly. Alternatively it could allow the Health Care Provider (HCP) to do so and send alerts to the HCP if, for example, the blood glucose levels are too low. More general, 5K Runner could display health benefits as motivating pop-up messages after completing the day's program. For the cues to actions component of the HBM, 5K Runner could push-up automatic reminders or suggest to 'book exercise in your calendar' or to keep the running shoes in a prominent location as a reminder to run next time. All these can contribute

to having users come back and complete their running program. For the TPB, 5K Runner could provide benchmark or role models for implementing subjective norms (TPB 4) or simulate an workout competition. For behavioral control (TPB 5), the application could integrate distance or physiological measures tracking and not just reference to GPS programs or runner forums as external sources.

For the TTM, 5K Runner could support users to make achievable and measurable plans for performance outside of a running session (TTM 7 and 8). It could suggest days for running and remind users to run. The application could keep sending those reminders after completing the program (TTM 9) to keep up high performance and fitness. For managing relapses, it probably takes more than a message in the help & tips section. Again, health care provider could contribute toward winning users back after a phase of relapse.

In general, for getting the best from both worlds, we would wish for integrating user's motives and aims for tailoring personalized advice that is integrated in a treatment plan for that person. It would be good to implement physiological benchmarks for alerting patients and health care provider, for example if a person has too high heart rates during workout. This is associated with an interface for the healthcare provider allowing for monitoring, guidance and feedback. Health and fitness applications should not only build performance, but also support building planning competence, support the perceived cost/benefits analysis, and provide long-term motivational support and relapse management. For implementing those, developers can greatly profit from mathematical modeling efforts in the health theory community.

REFERENCES

- Ajzen, I., & Fishbein, M. (1980). Understanding attitudes and predicting social behavior. Englewood Cliffs, NJ: Prentice Hall.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- Armitage, C. J. (2005). Can the theory of planned behavior predict the maintenance of physical activity? *Health Psychology*, 24, 235-245.
- Becker, M. H., & Rosenstock, I. M. (1984). Compliance with medical advice. In: A. Steptoe and A. Matthews (Ed.), *Health care and human behavior*, pp. 135-152. London, UK: Academic Press.
- Blumberg, S. J., Luke, J. V., Ganesh, N., Davern, M. E., Boudreaux, M. H. (2012). Wireless substitution: State-level estimates from the national health interview survey, 2010-2011. U.S. Department of Health and Human Services. Center of Disease Control and Prevention, National Health Statistics Report Number 61. Bethesda, DC: CDC.
- Boulous, M. N., Wheeler, S., Tavares, C., & Jones, R. (2011). How smartphones are changing the face of mobile and participatory healthcare: An overview, with example from eCAALYX. *BioMedical Engineering Online*, 10:24.
- DiClemente, C. C., Prochaska, J. O., Fairhurst, S. K., et al. (1991). The process of smoking cessation: An analysis of precontemplation, contemplation, and preparation stages of change. *Journal of Consulting and Clinical Psychology*, 59, 295-304.
- Free, C., Phillips, G., Felix, L., Galli, L., Patel, V., & Edwards, P. (2010). The effectiveness of M-health technologies for improving health and health services: a systematic review protocol. *BMC Research Notes* 2010, 3:250.
- Hall, K. (2012). Diet versus exercise in "the biggest loser" weight loss competition. *Obesity*, DOI 10.1002/oby.20065
- Huang, A. Barzi, F., Huxley, R., Denyer, G., Rohrlach, B., Jayne, K., & Neal, B. (2006). The effects of providing Internet shoppers with purchase-specific dietary advice: a randomized trial. *PLoS Clinical Trials*, 1:e2.
- International Telecommunication Union (2010). *Measuring the Information Society*. Geneva, Switzerland: ITU.
- IctQatar, Supreme Council of Information and Communication Technology (2009). *Qatar's ICT Landscape: Assessment of Information*

nology (2009). Qatar's ICT Landscape: Assessment of Information, Communication and Technology in Qatar. http://www.ictqatar.qa/landscape2009/index_en.htm. Last visit 26 November 2010.

Mozaffarian, D., Hao, T., Rimm, E. B., Willet, W. C., & Hu, F. B. (2011). Changes in diet and Lifestyle and Long-Term Weight Gain in Women and Men. *N Engl J Med*, 364, 2392-2404.

Murray, M. & McMillan, C. (1993). Health beliefs, locus of control, emotional control and women's cancer screening behavior. *British Journal of Clinical Psychology*, 32, 87 -100.

Patrick, K., Raab, F., Adams, M. A., Dillon, L., Zabinski, M., Rock, C.L., Griswold, W.G., & Norman, G.J. (2009). A Text Message-Based Intervention for Weight Loss: Randomized Controlled Trial. *J Med Internet Res*, 11(1):e1. DOI 10.2196/jmir.1100.

Prochaska, J. O., & DiClemente, C. C. (1984). Self change processes, self efficacy and decisional balance across five stages of smoking cessation. *Advances in Cancer Control – 1983*, pp. 131-140. New York, NY: Alan R. Liss, Inc.

Prochaska, J. O., Velicer, W. F., Rossie, J. S., Goldstein, M. G., Markus, B., Rakowski, W., Fiore, C., Harlow, L. L., Redding, C. A., Rosen-

A. BR UNS TEINET AL.

Copyright © 2012 SciRes.

5

bloom, D., & Rossi, S. R. (1994). Stages of change and decisional balance for 12 problem behaviors. *Health Psychology*, 13, 39-46.

Schwarzer, R. (1992). Self-efficacy in the adoption and maintenance of health behaviors: Theoretical approaches and a new model. In: R. Schwarzer (ed.), *Self-efficacy: Thought control of action*. Washington, DC: Hemisphere.

Schwarzer, R., Luszczynska, A., & Ziegelmann, P. (2008). Social-cognitive predictors of physical exercise adherence: Three longitudinal studies in rehabilitation. *Health Psychology*, 27, 854-863.

Shaw, J. E., Sicree, & Zimmet, P. Z. (2010). Global estimates of the prevalence of diabetes for 2010 and 2030. *Diabetes Research and Clinical Practice*, 87, 4–14.

Webb, T., Joseph, J., Yardley, L., & Michie, S. (2010). Using the internet to promote health behavior change: A systematic review and meta-analysis of the impact of theoretical basis, use of behavior change techniques, and mode of delivery on efficacy. *J Med Internet Res*, 12, 1:e4. DOI: 10.2196/jmir.1376.

World Health Organization (2010). *Global status report on noncommunicable diseases*. Geneva, Switzerland: WHO Press.

[Home](#) | [About SCIRP](#) | [Sitemap](#) | [Contact Us](#)

Copyright ? 2006-2013 Scientific Research Publishing Inc. All rights reserved.

Long-term changes in health behavior involve multiple actions and adaptations over time. Some people may not be ready to attempt changes, while others may have already begun implementing changes in their smoking, diet, activity levels, and so on. The construct of “stage of change” is a key element of The Transtheoretical Model (TTM) of behavior change, and proposes that people are at different stages of readiness to adopt healthful behaviors. Another application of the stages of change model in organizations and communities involves conceptualizing organizations along the stages-of-change continuum according to their leaders' and members' (i.e., employees') readiness for change. Table 1. Behavior Change Stages and Their Characteristics. See more ideas about Behavior change, Behavior, Health. Relations between the emotional health domain of the Gallup-Healthways Well-Being Index and the Big Five personality factors were determined at the American state level. State emotional health scores were based on the aggregated results of 353,039 phone interviews conducted throughout 2008 with a representative sample of US adults (Gallup 2009a). State z scores (Rentfrow et al. in *Perspectives on Psychological Science*, 3, 339–386, 2008) on neuroticism, extraversion, agreeableness... More ideas. Behavioral Psychology Behavioral Economics Transtheoretical Model Behavior Change Human Behavior Motiv Health behavior theories use detailed information about a person for predicting the likelihood of initiation and maintenance of health behaviors. Health applications can support the process of behavior change by providing in time, user- and stage-specific advice and encouragement. Current health and fitness applications use already successful smartphone capabilities for supporting goal oriented behavior and it does not take effort much to integrate the remaining components of health behavior theories. Current health and fitness applications are well adapted to athletes who experience workout and exercise as rewarding by themselves. They are not well adapted for the potentially 200 million overweight and obese smartphone users in the US. Special Issue "Health Behavior Change: Theories, Methods, and Interventions". Print Special Issue Flyer. Special Issue Editors. The Special Issue will begin with a series of articles from leading theorists and researchers in the field of behavior change that not only summarize the current state of the science in specific subfields of behavior change but also outline contemporary advances and new ideas that are gaining traction among researchers in the field and inspiring new lines of research in the pursuit of effective health behavior interventions. Importantly, the major part of the Special Issue will comprise research articles disseminating the latest findings of studies on behavior change from teams across the world. BEHAVIOR, HEALTH-RELATED Health-related

behavior is one of the most important elements in people's health and well-being. Its importance has grown as sanitation has improved and medicine has advanced. Attention toward this area of health behavior has increased greatly over the last two decades of the twentieth century, especially due to the AIDS epidemic. The most widely accepted theories about health behavior have been tested in research and found to be helpful in understanding or predicting health behaviors. Health behavior is, however, far too complex to be explained by a single, unified theory, and some professionals have devised models that draw on a number of theories to help understand a specific problem in a particular setting or context.