MAMMOTH MAGAZINE

THE OFFICIAL MAGAZINE OF THE CENTRE FOR STUDIES ON HUMAN STRESS

The Centre for Studies on Human Stress is dedicated to improving the physical and mental health of individuals by empowering them with scientifically grounded information about the effects of stress on the brain and body.

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New technologies and mental health: hit or miss?

Editorial

Catherine Raymond, Doctoral candidate in neurosciences at the Center for studies on human stress and editor-in-chief of the **Mammoth Magazine**

What is the first thing you do when you wake up in the morning? Do you go for a 5 km run; do you perform half an hour of *mindfulness* meditation? ... Or do you open your smartphone, your tablet or even your laptop in order to consult your different social medias? If I had to choose, I would choose the last option. This choice didn't come out of thin air... In fact, I'm basing myself on a recent statistic that stipulates that one smartphone user out of two consults their social media before even getting out of bed. Without a doubt, the use of these communication mediums takes up a great place in our lives. But what are their real impacts on health? The objective of this 17th edition of the **Mammoth Magazine** is to paint a picture of the latest scientific advances with regards to the impact (negative... and positive!) of new technologies on physical and (especially) mental health.

Camille Godin signs the first article for this edition. In addition to being a bachelors student in psychology at the University of Montreal, Camille is the co-founder of the "Les Rogers" blog, a page aiming to discuss student life at the University of Montreal and the metropolis, without mentioning essays and student support. Her article aims to shed light on the growing place new technologies take in the health field as well as in mental health research.

In a second article, **Sarah Leclaire**, masters student in neurosciences at the Center for studies on human stress (CSHS) attempts to explain the link between social media use and stress... In other words: using Facebook, is it stressful?

In a third article, **Marianne Verreault**, owner of a bachelors degree in psychology and member of CSHS, explains a new concept in health sciences: nomophobia: this fear of being deprived of our cellphone. This article aims to illustrate this recent phenomenon.

The fourth article of this edition of the **Mammoth Magazine**, called "Mobile applications for the benefit of mental health" , includes three sections signed by different scientists who, in collaboration with their research team, developed and scientifically validated applications in order to negotiate certain mental health issues. Not only can you learn more about these new tools, you can also use them at home, the latter being open to the public! In the first part, **Dr Pierrich Plusquellec**, Ph. D. in behavioural biology and researcher at the *Institut universitaire en santé mentale de Montréal* research center, describes the **iSMART** application, developed in collaboration with Sonia Lupien, director of the Center for studies on human stress, a mobile application that aims to reduce chronic stress. In the second part of this article, **Dr Antoine Bidaud-De-Serre**, Ph. D. in clinical psychology at the University of Quebec in Montreal, describes the **PsyAssistance** application, which aims to help with mood management, be it on a daily basis or during a crisis. Finally, **Dr Isabelle Ouellet-Morin**, Ph. D. in clinical psychology and researcher at the *Institut universitaire en santé mentale de Montréal* research center, describes the **+Fort** application, which aims to offer support to young people who are experiencing intimidation. To underline the career of this young researcher, in a fifth article, **Marie-Pier Robitaille**, Ph. D. in criminology from the University of Montreal, paints a picture of her scientific profile.

The sixth article is signed by **Justin Forest**, kinesiology student at the University of Montreal and founder of the blog "Optima", who's objective is to popularize scientific knowledge in the fields of sports and health. In fact, we know without a doubt that sports are beneficial for health as well as for biological stress. This article thus covers new technologies such as virtual trainers available via mobile applications that aim to increase physical activity. At the end of this article, you'll be able to answer the question: these mobile applications, do they really work?

Finally, the seventh and final article in this edition of the **Mammoth Magazine** focuses on a rising issue in young adults nowadays: eating disorders. In this article, **Joanie Thériault**, doctorate student in rehabilitation sciences at the University of Montreal, discusses the scientifically validated mobile applications used to decrease bad eating habits as well as the stress associated with them.

We hope that this edition gives you the technological tools needed to improve your physical and mental health, all the while teaching you about bad habits to avoid with respect to the abusive use of new technologies. On that note, enjoy the reading!

New technologies and mental health: two concepts that are now inseparable

Camille Godin
Bachelor's of psychology student, University of Montreal
Co-founder of the blog "Les Rogers", University of Montreal community

Information and communication technologies are now an integral part of our lives. They are part of our daily lives, be it through mobile phone or tablet applications or websites available on multiple electronic platforms. Innovative researchers have taken advantage of this situation by including new technologies in their research and thus creating new applications that will help with the management of many physical and mental health problems.

This project of using new technologies as a therapeutic tool is not new. It is in 1966 (!) that "Eliza", the first computer program to simulate a psychotherapist saw light of day. Its inventor, Joseph Weizenbaum, wished to demonstrate the communication, although superficial, that could be undertaken between Men and machines. Eliza thus asks simple questions to its interlocutor, who then responds. By following the psychotherapy model of active listening, Eliza emits answers based off elements its interlocutor previously said. Although the program was not very sophisticated and easily lost its meaning, people who interacted with Eliza had a tendency to reveal confidential information to it, just like they would have done with a real therapist. Scientists thus concluded that even given the obvious simplicity of the program, individuals showed a certain will to maintain a relationship with Eliza. Therefore, at the time we had already realized that machines could be a useful helping tool in the health field!

More than 165 000 mobile applications related to health are nowadays available to the general public. This type of technology, beneficial for both the professional and the patient, can be combined to all forms of conventional therapies. Applications can, amongst other things, serve as an intermediate or support in between appointments with a professional, or even as a tool to avoid having to travel and thus, receiving services at a distance. Certain applications can assure a direct communication with the professional and automatically send messages to the patient.

Literature evokes many cases where applications and text messages were tested, such as in the treatment of schizophrenia, diabetes, Parkinson's disease, sexually transmitted infections, anxiety, depression, self-harm, suicide and much more. The main advantages that users highlight are aspects such as the practicality and simplicity of functioning, the support and feedback that is offered to them as well as the low cost of the application. In the case of sexually transmitted infections for example, many participants of a study reported that the anonymity and speed of the process were two advantages that the mobile application guaranteed as opposed to having to travel to a clinic and feeling embarrassed during a one-on-one appointment with a professional.

Therefore, it is obvious that the use of new technologies in the support of recovery brings about certain advantages!

The possibility of having information and support at all times represents a substantial advantage. Two case studies in residences for elderly people in Australia have shown that the use of electronic tablets in anxious and depressed patients improved their level of engagement in therapy, their communication with the professional as well as their relationships with members of personnel. When they seemed more closed towards exchanges, or even when they seemed more depressed, patients were encouraged to search on their tablet for positive content. For example, a patient would look for pieces of classical music on *YouTube* in order to re-center herself in the present moment and decrease her level of distress.

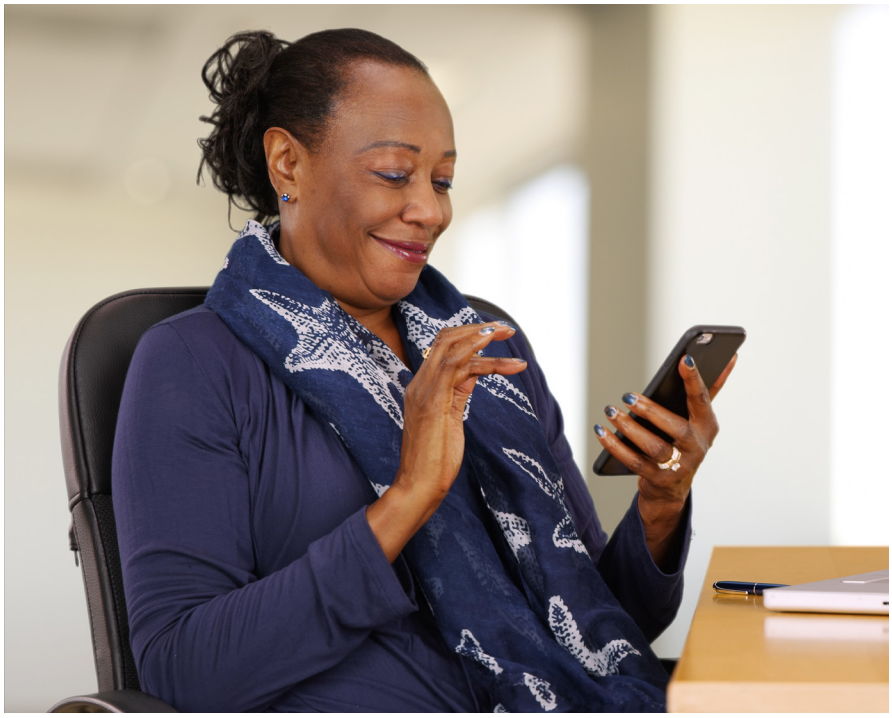
In teenagers, interventions based on technologies represent an interesting concept given that they not only have an interest towards these kinds of treatments but they are also skilled with electronic material. Often times, given the high cost and distance of services, young people receive little access to care services, if not at all. Thanks to information platforms and to mobile applications, young people dispose of support outside of therapeutic sessions. For example, they can share on the electronic platform Panoply, a mobile application, a negative thought that comes to their mind. The active peers on the platform give feedback to the young person by means of a structured response that allow for a cognitive restructuration of his thoughts. This application was in fact scientifically validated when it comes to reducing negative thoughts in young people.

On the other hand, many studies report certain drawbacks to the use of technologies in therapy. The main worry that comes out of these is the aspect of confidentiality. On one hand, it seems very advantageous, both for the patient and the professional, to be able to communicate and transfer personal data without having to go to an appointment. However, this could lead to a release of confidential information to a third party. Although some techniques are put in place to establish minimal risks, such as the encryption of data, the use of an anonymous username or password, the risk of a breach of information remains real. In a study where mobile applications were used by patients with an addiction problem, the GPS of their phone allowed one to identify if they were in a location at risk for consumption. This information could greatly compromise the confidentiality of their criminal activities, while the application itself was developed to bring them support. Also, very few available applications on the market were scientifically validated and evaluated with regards to their efficacy, thus leaving the consumer with doubt and uncertainty when faced with the choice of the application to use.

More than 165 000 mobile applications related to health are nowadays available to the general public.

To this day, studies present in the literature do not allow us to affirm that technological tools are as useful as traditional forms of therapy. However, many advantages, such as anonymity, a great accessibility and a reduction of negative thoughts have been observed following their use as a complementary therapy.

Therefore, do new technologies and research in mental health make a good match? According to us... Yes! And we are not the only ones to think so. The Institut univeritaire en santé mentale de Montréal research center (where the Center for studies on human stress is located) actually invests huge research efforts in the validation as well as the development of technologies and mobile applications that would allow us to understand and treat certain problems or conditions. You will find out more about the latter throughout this edition of the **Mammoth Magazine**!



Facebook:
Stressing or de-stressing effect?

Sarah Leclaire
Master's of neurosciences student, University of Montreal
Member of the Center for studies on human stress

According to Statistics Canada, 7 out of 10 Canadians use social media networks daily to communicate and Facebook is without a doubt the one that is the most used. It has in fact preceded the appearance of many other social media networks such as Instagram, Twitter and Snapchat. Facebook revolutionized the world of interactions by facilitating amongst others, communication between relatives who moved far away or even with old friends or classmates. However, there seems to be more communication amongst people before the arrival of all these social media networks. It is a known fact that a greater social support is associated with a greater well-being. Thus, we could imagine that Facebook would be an excellent way to reduce our stress... but is that really the case?

First of all, we have to know that in order to quantify social support received from Facebook (that we will further refer to as 'virtual social support'), researchers generally count the number of "Facebook friends" an individual has. Therefore, Oliver, who has 800 "Facebook friends", would have a greater virtual social support than Sophie, who has 150 "Facebook friends". By using this method of evaluation, a recent study showed that having a high amount of "Facebook friends" was associated with a greater secretion of stress hormones in adolescents, thus showing a greater physiological stress in adolescents who have a lot of "Facebook friends". Yet, these results go against what is expected, that is, that a greater virtual social support is associated with a lower secretion of stress hormones. Similar results were found in another study, which demonstrated that a higher amount of "Facebook friends" was associated with a higher rate of respiratory diseases. What is the link with stress you might ask? As a matter of fact, we know that stress is linked to a weakening of the immune system. And so, an individual who possesses a good social support should see their stress diminish, which would promote a stronger immune system that could properly fight against respiratory diseases. Yet, as you can see, the results obtained go once again against the hypothesis that a greater virtual social support has a buffering effect on the stress system. A third study has however been able to show that a high amount of "Facebook friends" was associated with less subjective stress, that is, the psychological feeling of being stressed out. Results from these three studies differ given that the studied variables aren't the same.

> simply watching someone else experience stress leads us to produce stress hormones, and this, even when the person is a stranger to us

In fact, the first study measured the secretion of stress hormones while the second study measured the rate of respiratory diseases and the third

study measured the psychological feeling of being stressed out. Thus, it is likely that more factors than just the amount of "Facebook friends", like for example Facebook usage, could influence the stress response.

As a matter of fact, a recent study mentioned that Facebook users are often exposed to other people's stress. This leads us to discuss "stress spillover", which is a scientifically validated phenomenon. It refers to the fact that stress can be contagious. In fact, surprisingly, simply watching someone else experience stress leads us to produce stress hormones, and this, even when the person is a stranger to us. In other words, learning by means of a social media networks that your "Facebook friend" Charles is panicking because his parents were in a car crash, could make you secrete stress hormones, even if you don't personally know his parents or aren't very close to Charles! Thus, Facebook seems to stress us out by means of stress spillover.

Another factor that could explain Facebook's influence on our stress is the quality of our social exchanges. In fact, a greater quantity of exchanges doesn't necessarily mean a greater quality of exchanges. And so, having many "Facebook friends" doesn't necessarily mean that you possess a social support of good quality. Just think about the cyber bullying that came about after the appearance of social media networks. Today, kids are not only intimidated at school but also at home through social networking. The huge amount of stress that is associated with intimidation is thus, not only experienced at school but also in the comfort of our own homes.

Additionally, note that Facebook does not have the same effect for everyone. In fact, some researchers discovered a sex difference when it comes to the use of social media networks. Women tend to post more emotion related content then men, who tend to post more neutral content. Women are also more sensitive to the stress experienced by their "Facebook friends". Thus, it is feasible to believe that the impact of social media usage on health could be different depending on sex, with women possibly being more affected than men. Additional studies will be necessary to elucidate this.

Quite obviously, Facebook doesn't only have negative consequences on our stress. In fact, a study showed that the positive feedback received by adolescents through Facebook was linked to a higher self-esteem and well-being. We actually know now that a higher self-esteem is linked to a lower stress response. Furthermore, another study showed that the use of Facebook had a buffering effect on the stress response. Researchers have in fact shown that individuals who used Facebook before experiencing a laboratory stressor had lower physiological stress responses and perceived the stress task as being less threatening than people who did not have access to the social media network. Additionally, another study wanted to find out if a stress management program would be more useful when it was done through a Facebook group or in person. Participants in this study, first year medical students, appreciated the stress management program more when it was in the form of a Facebook group. In fact, Facebook brought a form of social support by means of exchanges between students, and through its privacy, avoided stigmatisation that was experienced during in-person meetings. Finally, our laboratory showed during a study done on adolescents, that a higher amount of interaction behaviours, such as commenting or looking at others' pages and sharing photos, was negatively associated with cortisol secretion. In other words, the more people had interaction behaviours on Facebook, the less they secreted stress hormones.

having many "Facebook friends" doesn't necessarily mean that you possess a social support of good quality

In conclusion, Facebook certainly has beneficial impacts on stress if we control some factors associated with its usage. The few studies on the subject show that having many "Facebook friends" creates the illusion of having a big social support, as long as we receive positive feedback from our virtual friends. On the other hand, we should avoid these social media networks if they become a source of intimidation or a constant exposition to the stress of others! We should therefore keep in mind that these factors can modulate our own stress and that we should act accordingly.

"*Nomophobia*" or the fear of being cut-off from the virtual world

Marianne Verreault
Bachelor's in psychology, University of Montreal and member of the Center for studies on human stress

We live in a technological era, that is undeniable. In 2016, 76% of the Canadian population owned a smartphone compared to 55% in 2014, demonstrating an impressive increase of 21% in only two years. Instinctively, we tell ourselves that for it to be as popular as it is, it must bring about important benefits for its owner. Is that truly the case? Indeed, the smartphone allows its user to constantly be connected to information and social media. It has in fact become reassuring for many people to have access to their smartphone. For example, in case of doubt we can look up an information; when we are lost, we can easily find our way; in a problematic situation, we can easily contact a close friend. A study has actually shown that the smartphone, thanks to the vocal contact with a person it offers, allows us to decrease our stress levels more rapidly than if we remained alone or in touch by text message. But what about the other potential advantages and disadvantages of the smartphone?

You are probably aware that when you have a bad day, you can easily transmit your bad mood to your surroundings by talking to them (face to face or by phone). Did you also know that you could undermine someone's mood just by sending them a neutral text message? This phenomenon of emotional contagion was studied by researchers at the Cornell University.

the more time one spends on their phone, the more stressed out they feel in life

They demonstrated that following a neutral text message conversation between a person with a negative affect and a control subject, the control subject had a greater negative opinion of the other person and rated themselves more negatively!

We could also look at the risk of addiction to smartphones. With regards to its association with stress, the few studies published on the subject tend to show that they are correlated: the more time one spends on their phone, the more stressed out they feel in life.

Still not convinced that the smartphone can be harmful? After all, in your day to day life, you are not addicted to your phone! ...Right? Yet, what happened last Tuesday when you forgot your phone at home? Here are some of the possible scenarios I propose: 1) You immediately went back home to get it or 2) you went on with your day with a (slight or strong) feeling of discomfort or anxiety. Well, if I guessed correctly, you probably experienced one of these two scenarios that day... and you may be suffering from "nomophobia", as in "**no mo**bilephone **phobia**"... When people hear this term for the first time, they often make a mockery of it... Who would

2 out of 3 people (64%) feel powerless without their cellphone and access to the internet

be addicted to their smartphone to the point of developing a phobia from being separated from it? Well, you got that last part right, this phobia does not exist, at least not yet from a clinical standpoint according to the *Diagnostic and Statistical Manual of Mental Disorders* (DSM), the reference in diagnosing mental illness in North America.

For nomophobia to be classified as a specific phobia, it would need to fulfill the following criteria:

- Immediate anxiety reaction, in the form of a panic attack
- Recognition of one's excessive or irrational fear
- Avoidance or feeling of anxiety when the situation cannot be avoided
- Disturbance of one's habits and social and professional activities

In an article published in 2014, researchers Braggazi and Del Puente were the first to suggest the addition of nomophobia in the DSM, encountering a lot of scepticism from their colleagues.

To get back to the history of nomophobia, the term first appeared in newspapers in 2008, following a study commissioned by the *UK Post Office*. The term they used to describe the phenomenon was highly criticised. In Latin, "Nomo" means law and so nomophobia should be defined as an excessive fear of laws. At the Center for Studies on Human Stress, we prefer to call it nomosensitivity, in other words, a sensitivity associated with being away from one's phone, since it does not refer to a recognized phobia. However, for the remainder of this article, we will continue to refer to it as nomophobia in order to remain true to the vocabulary already used in literature. Although its terminology has provoked some controversy, the discomfort associated with the absence of cellphones felt by a number of people is a reality that cannot be overlooked. The anxiety and stress linked to the phenomenon in question can be seen in many places such as the workplace or school. In these places, smartphones are usually removed to increase productivity and alertness. However, more often than not, we get the opposite effect: a decrease in performance because of the anxiety generated by the absence of the smartphone.

In Quebec, *Rogers Communication* focused on the subject and surveyed the public to observe the extent of the phenomenon. The latest data is from 2012 and paints a worrisome picture: 2 out of 3 people (64%) feel powerless without their cellphone and access to the internet. These results are similar to those collected by *SecurEnvoy* in 2012, which state that 66% of the United-Kingdom's population suffers from nomophobia. Let us remember that since 2014, the number of Canadians who owned a smartphone has increased by 21%. Thus, we can inquire about the extent of this phenomenon nowadays and the extent it could possibly hold as the years go by.

Still convinced your smartphone is a reliable ally? You have yet to know whether or not you are nomophobic! Scientific literature has not yet spoken on the types of personalities that could be more prone to nomophobia. This opens up a wide and fascinating field of research!

Mobile applications for the benefit of mental health

During the year 2011, the *Institut universitaire en santé mentale de Montréal* research center received a 1 million dollar donation from Bell Canada as part of its philanthropic action on mental health, 'Bell let's talk'. This grant was awarded with the goal of developing new mobile applications for mental health. During this same year, a partnership was developed with the Superior School of Technology (*École de Technologie Supérieure*; ETS) in order to allow our researchers to take advantage of the ETS's expertise in information technology engineering and it is thanks to these two collaborators that researchers have been able to develop the following three mobile applications.

iSMART, a mobile application to help you neutralize your Mammoths!

Dr Pierrich Plusquellec
Ph. D. in behavioural biology
Professor in the department of criminology at the University of Montreal and researcher at the Institut universitaire en santé mentale de Montréal research center

Chronic stress

Nearly 500 000 Canadians are absent from work every week because of health problems related to chronic stress, which is a major risk factor leading to disease. Chronic stress is characterized by a repeated exposition to a perceived threat which leads to a dysregulation of our

undergoing chronic stress results in our incapacity to understand and to control the way our brain perceives different daily situations through the “eyes of stress”

biological stress system. Therefore, undergoing chronic stress results in our incapacity to understand and to control the way our brain perceives different daily situations through the “eyes of stress”. From this fact, and of course from her knowledge on stress research, Sonia Lupien, director of the Center for studies on human stress and editor of the **Mammoth Magazine**, had the vision, many years ago, to develop a tool that would allow us to record our stress experiences, to detect the presence of chronic stress and to solve it. Thus was born iSMART, for Stress Monitoring Assessment and Resolution Technologies.

What iSMART does

iSMART has two main functions: (1) collect the stress you feel, archive it and inform you of the risk of chronicity and (2) help you neutralize daily situations that are risk factors for chronic stress.

When you log onto the application, you must watch two videos that teach you how iSMART works and how to recognize a stressful state. Afterwards, the application will ask you to set up reminders, that is, the frequency at which you would like iSMART to ask you how stressed out you feel. All you have to do next is turn off iSMART and it will take care of the rest. Therefore, iSMART will turn on at regular intervals, ask you how stressed out you feel (from 1 to 10) and archive this data. If your stress level exceeds a certain threshold, it will then offer you solutions to reduce the discomfort linked to stress in the form of videos. If a high level of stress become chronic, then iSMART will warn you and will propose you scientifically validated solutions to neutralize the risk.

How to use iSMART

The most efficient way to use iSMART is to tell yourself that you are going to work on your chronic stress for a month. You then set up reminders in such a way that every hour, iSMART ask you how stressed out you feel, from Monday to Friday 8am to 9pm. It’s a shock treatment! But, it’s the one we tested with people who took part in our validation study.

A validated application, the undeniable advantage of iSMART

There are 2 million applications on the AppStore, many of which pretend to be useful in managing stress. However, none seem to have been scientifically tested. Scientifically tested, that means that we recruited 70 participants half of which used iSMART. Measures of stress and of psychological well-being were collected before the use of iSMART as well as 1 month after. Those who had yet to use iSMART could afterwards do it. Interviews with users showed that iSMART was a great way to become aware of chronic stressors, who are otherwise unseen until the day they make us sick. Preliminary results show us that the intensive use of iSMART for one month not only allows us to detect Mammoths (detect chronic stressors), but also allows us to reduce our biological stress! iSMART thus becomes the first mobile application to be scientifically validated to deal with chronic stress.

Who can use iSMART, and what’s in store for its future

iSMART was launched on the AppStore on October 12th 2016. In one week only, it had 3 600 downloads and Mammoths beware because all iPhone users can use it without restraint. Android user get ready, your turn is coming up soon. iSMART’s history is only beginning. Already, researchers are collaborating with the CSHS to develop iSMART-Bio, who will not only use the stress you feel to detect chronic stress but also use your heart rate as a predictor, and this, independently of the activity you are performing... without a doubt to be followed on www.humanstress.ca

For all complementary information, refer to the website of the application: https://ismartstress.wordpress.com/

Thanks to the people involved in the iSMART adventure: Edward Hill (engineer), François-Olivier Leblanc and Antoine Lamy (developers), Maxime Cloutier (research coordinator), Gabrielle Reyburn (research assistant), and all our participants!

PsyAssistance

Dr Antoine Bidaud-De-Serre
Ph. D. in clinical psychology, University of Quebec in Montreal
&
Dr Réal Labelle
Researcher at the Institut universitaire en santé mentale de Montréal research center
Professor from the department of psychology from the University of Quebec in Montreal

Throughout their lives, 15 to 19% of Canadians will suffer from an episode of major depression, which translates to more than 6 million individuals. The extent of this problem warrants us to develop new methods of intervention in order to treat depression, or even better, to prevent it. Psy Assistance, an iPhone application to help people make sense of themselves and to maximize well-being, is part of this much awaited movement! Created in 2011, the application allows users to access an index of resources, to hold a mood diary, to perform exercises that improve well-being and to establish a security plan in case of crisis. These functions are based off of the theoretical basis of cognitive behavioural therapy, one of the best scientifically validated psychotherapies (see **Mammoth Magazine** number 16 to learn more about this therapy!).

Developed by professor Réal Labelle's research team, Psy Assistance was funded by the *Institut universitaire en santé mentale de Montréal* foundation in collaboration with Bell Canada. This mobile phone software is available on the App Store. It can serve as a personal help tool as well as a tool used during psychotherapy. However, it is to be noted that the application does not substitute consulting a health professional.

Psy Assistance's creation originates from two sources. Firstly, the concept was developed with the emergence of new technologies and the unpreceded possibilities they offered for mental health. Afterwards, the research team realized the importance of digitizing elements of the cognitive behavioural therapy for mood disorders, with or without suicidal conduct. These particular elements are, for example, clinical information, psychotherapy exercises and calls for help.

In order to do so, an application was developed in two parts. First of all, an inventory of all the material judged useful to managing mood well, with or without crisis, was made and adapted into computer language. These first versions gave light to many tests performed by the research team.

Following this, a rigorous protocol founded by the Canadian program for the marketing of innovations was followed. This process led to many research protocols aiming to validate and evaluate Psy Assistance. In order to do so, the application was first presented to 145 health professionals in three congresses in Quebec and in Ontario. Afterwards, six doctorate students and two professors from the psychology department of UQAM tested the application daily for two weeks. Finally, two depressed patients tested the functions of the application for the same period of time. According to the results of these different steps, the application was well received by clinicians as well as patients, the latter stating the application was clear, easy to use and pertinent to treatment. The research team then proceeded to perform the last step – the evaluation study.

Realized over 12 weeks, this evaluation study consisted of a cognitive behavioural therapy psychotherapy which was assisted with the application. Many indicators have been revealed throughout the intervention, such as daily self-evaluations of mood and self-reported questionnaires. Results show that the application is not detrimental to the therapeutic relationship with the depressed patients and that this digitized modality seems to be as useful, if not even more, as the support offered using pen and paper.

All in all, Psy Assistance constitutes a promising scientifically validated progress, in addition to being a tool that is available for people who wish to better manage their mood.

+Fort

Dr Isabelle Ouellet-Morin
Ph. D. in clinical psychology
Professor from the department of criminology from the University of Montreal and researcher at the Institut universitaire en santé mentale de Montréal research center

In collaboration with members from her team: Marie-Pier Robitaille, Anaïs Danel, and Carole-Ann Colin

The intimidation occurring between young people has evoked the media's and the population's attention for many years now, which today makes it a priority in public health and security. Intimidation is defined as a repeated and prolonged exposition to acts that aim to intentionally compromise or harm a person. It occurs between young people who have established a relationship of unequal power and where the victim comes to believe that it would be difficult to get out of such a relationship. One out of five children in Canada are victims of intimidation and many difficulties are associated with it such as low grades and emotional, social and behavioural problems.

To this day, few validated tools exist in order to support young victims of intimidation. It is to overcome this shortage that the mobile application +Fort was developed. It aims to reduce victimisation experiences and to promote well-being in young people by supporting the initiation of a change.

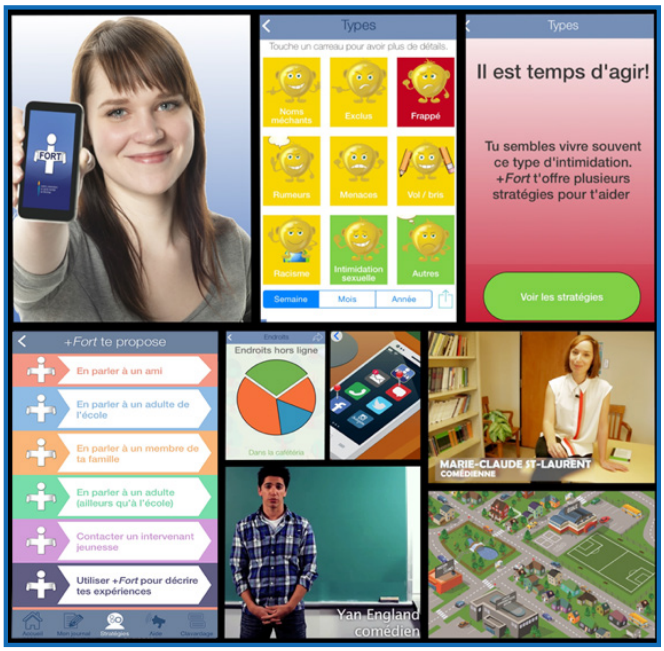
Why a mobile application?

The use of new technologies is ubiquitous in young people's lives. Nearly half of them own a smartphone at the start of high school and about 85% have one at the end of high school. These platforms have the advantage of allowing victims to receive help even if they would initially rather keep the intimidation they are living secret for reasons such as shame or fear of consequences.

+Fort: a mobile application for victims of intimidation

Three goals are pursued in the application. First, it informs young people about intimidation in a playful and dynamic manner with the help of videos starring youth role models, an interactive card and an index of help resources. +Fort also helps young people better understand their experience of intimidation with the help of regular evaluations and graphs that are easy to understand and to share and that illustrate the types of intimidation experienced, the places where this takes place and if it increases or decreases with time. This helps users to better understand what they are experiencing in order to initiate better adapted strategies to their situation. Finally, the application offers many strategies and invites users to evaluate them in order to identify the ones that work best for them. Figure 1 illustrates some functions of +Fort.

Figure 1.



Initial exam of the utility of +Fort

To this day,s few interventions have been scientifically evaluated and only a small amount have shown, at best, a moderate effect. Consequently, it is possible that many of these do not produce the desired effects or even worse, contribute to worsening the situation. In order to avoid this, we have conducted a pilot study and two exploratory studies aiming to evaluate the utility of +Fort.

Pilot study

Following the completion of a first version of the application, we invited eight young people aged 12 to 16 years old and five adults (interveners and parents) to use the application for four weeks and to participate in a group discussion. All have said that +Fort would be useful for victims but could also be a useful tool to allow young people and adults to learn more about intimidation.

"We talked about it (intimidation) at school for three hours and I learned more about it in five minutes by using +Fort"- a 14 year old boy.

In particular, young people enjoyed the confidentiality offered by the application and the diversity of the strategies presented, the virtual card and the videos.

First study

This study was led in order to learn more about young victims' perception of +Fort and to start understanding the mechanisms by which it could help reduce intimidation. Twelve young victims of intimidation aged between 12 and 16 years old (nine girls and three boys) were invited to use +Fort for four weeks and have participated in a meeting to discuss the following themes: opinions on +Fort, personal history, usage experience and perceived usefulness of the application. The young people appreciated the confidentiality and the possibility to reveal their experiences without judgement or pity:

"With adults, it's a more personal reaction. They'll say 'Oh, it's hard what you're going through', but we already know it's hard and then you see their pity. I rather this way (with +Fort), y'know, with the graphs you see for yourself that it's serious" – a 13 year old girl.

All stated that +Fort helped them have a more objective view of what they were going through:

"The tests (evaluations) help you realize what you're going through, it helps you make strategies to get better" – a 13 year old girl.

They also state being more motivated to put an end to intimidation:

"Before +Fort I was discouraged, I still am when I get home, but with +Fort, with the strategies, it gives me hope. Before, I had my own strategies but they weren't the best I'd say" – a 14 year old boy.

Finally, they state feeling more in control and confident of their ability to end intimidation:

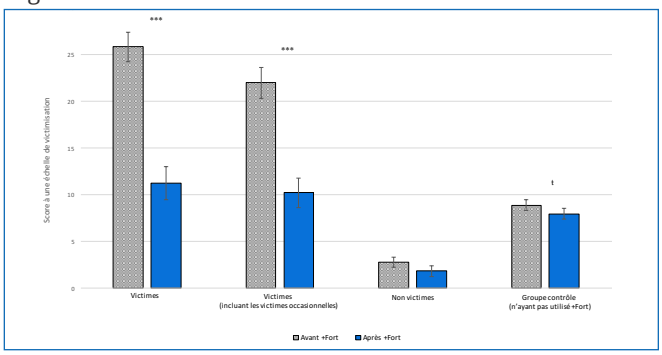
"(...) when you speak with an adult, he will do something, but with +Fort, I have to do something with the help of +Fort" – a 14 year old boy.

In parallel to the content of these discussions, statistical analyses have shown a reduction in the intimidation that was taking place following the four weeks of usage of the application.

Second study

Students from two high schools completed the selection questionnaire, including a validated measure (a scientific questionnaire) of intimidation. A total of 40 young people aged 12 to 16 years old (23 boys and 26 girls) used +Fort for four to six weeks, including young people who were experiencing moderate to high (23 young people) levels of intimidation, occasional victims (5 young people) and non-victims (12 young people). A control group consisting of 170 young people of the same age who did not use +Fort was also included. Figure 2 shows the intimidation reported before and after the use of +Fort for each group. A reduction in victimization was observed for the victims. It is without surprise that +Fort did not have a notable effect for non-victims. In fact, the results suggest the possibility of a small reduction in intimidation for young people from the control group. However, the noted effect is 11 to 16 times smaller when compared to victims who used +Fort, thus suggesting that the noted tendency is not comparable nor is it promising of a clinical notable effect.

Figure 2.



Conclusion

The initial exam of the utility of +Fort suggests that this tool constitutes an interesting help resource for young victims of intimidation. Considering the methodology used and the small number of participants, we remain cautious with the results obtained. +Fort can be downloaded for free on the AppStore. It can also be used by parents and interveners. More information on intimidation and on the application is available on the website (plusfort.org) and in a practical guide dedicated to parents and interveners. It is together that we will support young people in the development of their full potential, intimidation or not!

Researcher profile: Dr Isabelle Ouellet-Morin

Innovating in research to better understand and accompany young people… from their genes to their smartphones

Marie-Pier Robitaille, M. Sc.
Doctoral candidate in criminology, University of Montreal
&
Lidia Corado, B. Sc. coordinator of the Laboratory of simulated conduct of the University of Sherbrooke and student in public relations at the University of Montreal.

Dr Ouellet-Morin completed her doctoral studies in psychology at the University of Laval where she studied the genetic and environmental factors that explain individual differences in the secretion of stress hormones during early childhood. She further expanded her interests in research by completing a post-doctoral internship at *King's College London*, in England, where she found an interest in victimization. She demonstrated that the stress experienced by young victims of intimidation modifies the DNA structure on a precise gene known for its great influence in the development of mood disorders. This is a very important discovery, showing that intimidation experienced during childhood can genetically predispose one to the development of mood disorders later in their life. She also demonstrated that intimidation influences physiological stress. In December 2011, she joined the School of criminology at the University of Montreal where she now holds the position of assistant professor. Here you will find the profile of a young innovative researcher who is determined to make things better for kids!

Financed researcher by the Canadian Institutes of Health Research (CIHR), the studies of Dr Ouellet-Morin nowadays deal mainly with intimidation, childhood adversity as well as biological stress. Although her studies that are published in known international journals are read, greeted and taken by the scientific community, she invests a great deal of her time towards the transfer of knowledge to the general public and to the clinical application of her research results.

Multidisciplinary and innovative approach

It is by adopting a still emerging approach in criminology, which considers the constant interaction of genetics and environment in the development of antisocial behaviours that Dr Ouellet-Morin stands out in her field. As soon as she came back from London, she proposed a research program oriented towards physiological (for ex., stress hormones) and psychological (for ex., adjustment strategies) mechanisms that result from adversity and stress that children are confronted with as well as the factors that contribute to the vulnerability and to the resilience of individuals confronted with such experiences. She is actively involved in many research projects and often starts some large-scope projects herself. In fact, she showed that domestic violence experienced by women contributes to their mental health disorders and that psychological difficulties in many women could be reduced by putting an end to the victimization they experience from their partner. In parallel, she seeks to better understand the origin of aggressiveness in reaction to adult men's environment and if the latter is associated with childhood adversity. Only after as little as four years after being hired as a professor at the University of Montreal did she have two major projects branding her as a young promising researcher.

> intimidation experienced during childhood can genetically predispose one to the development of mood disorders later in their life

Childhood adversity and stress hormones in hair

A fair amount of studies have shown associations between the exposure to many adverse environmental factors during childhood and mental health disorders during teenage and adult years. The underlying mechanism to these associations however, remains unclear. In other words, how can these events, happening early on in life, lead to an increase in mental health disorders throughout development? One of the studies conducted by Dr Ouellet-Morin aimed to better understand how this early adversity gets "under the skull, the skin and the cells" and affects mental health in adulthood. In order to do so, she tested if childhood adversity modifies

physiological systems conceived to support stress adaptation (stress' physiological response as well as some genetic markers) and if these effects are cumulative, sensitive to time or vary as a function of environmental context (ex: family, peers). This project also aims to evaluate if these disruptions explain the impact of childhood adversity on mental health during adolescence.

Although the stress hormone that is often studied is cortisol, few studies have yet to use hair to measure it. That's right... We can measure stress hormones in hair! The main advantage of using hair to measure cortisol, is that it informs us on the secretion of cortisol in a retrospective manner, that is during the last three months and that the measure is less sensitive to factors that are susceptible to influence it (for ex., time of day, food consumed). It is also a much less invasive method to measure stress hormones as opposed to a blood sample.

Therefore, following this innovative protocol, Dr Ouellet-Morin analysed cortisol secretion in the hair of more than 1 600 young people who were followed since they were 5 months old. The crossing of this information with that which was collected over the years regarding personal and family traits of the participants as well as their environment and behaviour, will allow us to better understand the underlying mechanisms of the association between childhood adversity and vulnerability to mental disorders in adulthood. This is the first study of such scope that will evaluate persistent changes in cortisol secretion on health with repeated measures.

Dr Ouellet-Morin is thus a reference in the field of consequences associated to childhood adversity and the support of those who experience it. It is without a doubt that her innovative projects will continue to spread here and internationally, be it in scientific journals as much as in the lives of young people who will benefit from them.

studies tend to show that the use of mobile applications does in fact promote physical activity

New technologies... Motivate me to practice sports!

Justin Forest
Kinesiology student at the University of Montreal
Certified in massage therapy Founder of the blog "Optima", sports community

It is well known that physical activity allows one to reduce their risk of developing cardiovascular diseases and obesity, which are both closely linked to chronic stress. Not only does physical activity reduce these risks, but being active allows us to reduce our subjective stress (when we fell stressed out) as well as our biological stress (the hormones that are secreted when we are in a stressful situation). A study even suggests that moderate and regular physical activity helps to improve symptoms of depression, burnout and anxiety, which are also all linked to chronic stress.

Thus, physical activity is an excellent tool in maintaining a good physical and mental health... There is no doubt about it! That being said, the awareness of physical activity remains a problem, especially for 18-35 year olds who continue to show increasing scores of obesity. Considering that approximately 70% of North Americans own a smartphone and that 18-35 year olds are the most connected age group, inciting people to become active via their smartphone could be the answer to reduce this increasing rate of obesity. That being said, do the latter really promote physical activity? In other words, do they actually reach their goal?

The use of a smartphone to promote physical activity is very large given the number of mediums available nowadays. Two main subjects concerning the latter will be discussed

here, starting with the efficacy of text messages as reminders followed by the use of virtual trainers available via mobile applications.

Text messages as motivators

Many elements make it so that a person wanting to lose weight will succeed in doing so and in maintaining their weight loss. In fact, according to the latest studies, the hardest part of losing weight is maintaining this weight loss once the desired weight is reached. According to a scientific study, fitness programs have mixed results. In fact, in this study, participants gained back on average 40% of the weight they had lost after one year and continued to gain weight after their first year. According to these researchers, the challenge is maintaining a healthy lifestyle for a period of two to five years in order to succeed in maintaining the weight loss in the long term. Two to five years of changing our lifestyle, that seems tedious! Experts state that in order to be able to do so, a follow-up and self-monitoring of our lifestyle is the best way to go. This follow-up can take multiple forms. For example, it can be to write down our weight, our eating habits or even our level of physical activity. As a matter of fact, a study showed that writing down data about our physical activity is beneficial for getting back in shape as well as for weight loss. Unfortunately, for reasons such as daily stress, 70% of participants have abandoned this good habit.

Thus, some researchers have examined if the facilitation of this follow-up by the use of text messages could be a useful technique in order to maintain a healthy lifestyle. They have studied, for more than 4 months, participants who received personalized reminder text messages on a precise aspect of their lifestyle (for example, physical activity or even diet) and they compared them to a group of individuals who did not receive any reminder text messages. These researchers noticed that the group of individuals who did not receive any instructions had lost less weight than the group of individuals who received daily text messages reminding them, for example, to eat breakfast or to do physical activity. In the end, the group of individuals who had an electronic follow-up lost, on average, 2 kg more than the group of individuals who did not receive an electronic follow-up during the study. More than 95% of participants recommend this method of functioning to their peers.

In short, this study suggests that a regular follow-up using new technology could be the answer to successfully losing weight and most importantly in maintaining this weight loss. That being said, a lot of other technologies state being able to promote the upkeep of healthy lifestyles. Amongst these, we find mobile applications.

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The efficacy of mobile applications

Many web programmers conceived an array of different mobile applications aimed to promote physical activity and health. In 2013, 41 246 mobile applications axed on physical activity were available! Some researchers thus attempted to validate the efficacy of the applications in increasing physical activity. In order to do so, a lot of different things can be measured: we can measure motivation to perform sports, weight loss, the reduction of subjective stress in relation to the use of the application and much more. In general, studies tend to show that the use of mobile applications does in fact promote physical activity. That being said, every one of these applications have different goals (for ex. some aim to encourage weight loss, other aim to increase the frequency of physical activity, etc.). These same researchers thus suggest that it could be beneficial to combine certain applications in order to answer the multiple needs when it comes to physical health.

More good news... No significant difference was found between the efficacy of free and paying applications! And so it would seem that both are equivalent when it comes to the benefits they can confer.

That being said, it is important to underline that no application to this day has been scientifically validated in its efficiency to improve health (for example, cardiovascular health or even mental health in general). Some groups of researchers have however stated their interest in undertaking these validation studies and it is highly probable that we will discover scientifically validated mobile applications in the years to come!

Personality, not to be forgotten

It is important to mention that we are all very different when it comes to our motivation to perform physical activity. While some people run two marathons a year for fun, others have a hard time putting their running shoes on for a quick jog. These individual differences are quite normal! That being said, it is possible that the use of an external medium in order to motivate ourselves is something that is necessary for some people and not for others!

Mobile applications to reduce symptoms associated with eating disorders

Joanie Thériault
Doctoral student in rehabilitation sciences at the University of Montreal

For most of us, feeding ourselves is part of our everyday lives and doesn't bring about feelings of anxiety. Unfortunately, for other it is hard to maintain a good relationship with our diet. In some cases, they will even been diagnosed with what we call an eating disorder (ED), defined as a persistent eating problems or eating habits that are harmful to physical health or daily functioning. In everyday language, we often refer to ED as anorexia or bulimia... There is however a spectrum of ED that includes many other disorders or symptoms that warrant particular care. People suffering from ED can turn to what we refer to as "self-care" in order to favour their recovery. This term refers to the person taking charge of their mental health condition using their own means and rehabilitation strategies. Traditionally, the person who chooses to undergo this type of intervention receives bibliographical support (for example, from books or manuals), support groups and, in some cases, a mental health intervener. The arrival of technologies, especially of mobile applications, revolutionizes our way of doing.

Many mobile applications for eating disorders were developed and validated and are still under study to be later released on a larger scale. The latter come in different shapes and

Research shows that applications can play a role in reducing symptoms associated with ED

sizes and are composed of different functions. Most of them (for example, the Student Bodies program from the application Lantern as well as YoungEsprit which is still currently being validated) have a tool box where users have access to essential information such as anxiety management strategies when it comes to food and information on misleading views of one's body. We find questionnaires and useful tips as well as references and more specialized resources. In the event of psychological distress (for example, if there is a risk of suicide), the users will receive direct support from an intervener. Furthermore, a connection with emergency resources can be made. Most of the mobile applications offer a forum that allows users to communicate with each other and to get support, or even to chat with an intervener. In most cases, these applications can be set up by the user in order to receive notifications, motivation or support and to obtain a summary of their condition (reduction of symptoms, success in achieving the goals the person set out for themselves). Even more, they offer anonymity and confidentiality... So, why not use them if you have symptoms of ED?

Research shows that applications can play a role in reducing symptoms associated with ED such as the frequency of binge eating episodes and of purges (self-induced vomiting and abuse of laxatives), fasting episodes as well as improving mood and cognitive flexibility (capacity to adapt to novelty and change). Other studies are to come in order to support without a doubt these results! Data available up to date allow us to consider that self-care mobile applications could be offered to people who are on a waiting list for specialized clinical services (outpatient clinic, day program, day hospital or hospitalisation unit) in order to avoid a worsening of their state. These results led many experts to recommend self-care mobile applications for everyone who, although do not reach the clinical threshold for an ED, have a problematic relationship with their diet. Health professionals believe that this intervention could improve these people's state and could avoid the development of an ED.

Self-care mobile applications are also seen as a possibility for supporting the gains obtained from specialized treatments. For example, studies have shown that self-care mobile applications offered during the time off from the specialized services are very well used by users, that they increase the rate of remission and that they allow for the upkeep of the results obtained during specialized therapy. Knowing that many people with ED experience multiple relapse episodes and return to specialized treatment, the use of a self-care intervention mobile application following the time off from specialized services is of great importance.

However, we must remain wary of certain free applications offered on Apple and Android platforms. Although some seem to be well conceived and could be useful, developers do not provide information as to the studies that were done to determine if the application was safe and effective.

The available knowledge up to date allows us to have a positive view of technologies on prevention and treatments of ED. These technologies could allow for the broadening of available services for people having an ED. One thing is for sure, there is a promising future for the use of technologies in helping people with an ED in the next years.

NEXT MAMMOTH

Do not miss our next edition of the Mammoth Magazine on stress and anxiety. We often mix up these two terms, and although they share many similarities, they are nonetheless distinct concepts. Is anxiety normal? Should I seek help and what are the best treatments? In our next edition, we will answer these questions and we will also address a timely topic, performance anxiety. It is thus a rendezvous that you do not want to miss!

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Editor in chief:
Catherine Raymond, B. Sc.

Editor:
Sonia Lupien, Ph. D.

Publishing:
Jean Lepage, B.B.,
adjoint DC, communications

Sonia Lupien, Ph. D.

Revision:
Sarah Leclaire, B. Sc.

Editorial Team:
Camille Godin, B. Sc.
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Marie-Pier Robitaille, Ph. D.
Justin Forest, B. Sc.
Joanie Thériault, B. Sc.

Translation:
Danie Majeur

Infographics:
Techniques audiovisuelles HMR


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